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NOTES

ON

DISEASES IN TURKEY,

AND

MEMOIR

ON THE

REMITTENT FEVER OF THE LEVANT.

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1854.

DEPARTMENT MEMORANDUM.

The following observations by Drs. Schulhof and Bryce will doubtless prove most acceptable and useful to the medical officers of the army in Turkey, to whose attention they are specially recommended.

When a desire was expressed to possess the results of their experience, in reference to some of the diseases of Turkey, both gentlemen responded with the greatest possible alacrity; therefore, I feel assured the officers of the department generally will join with me in thanking them for their generous and able services in the cause of humanity.

The extracts from the reports of Dr. Bryson and Mr. Drummond, Deputy-Inspectors-General of hospitals and fleets, are deserving of special attention, as there is reason to believe periodic fevers may be averted by adopting the practice recommended by Dr. Bryson, and cured, after having resisted other medicines, by the remedy which was resorted to by Mr. Drummond.

AND. SMITH, M.D., Director-General.

Army and Ordnance Medical Department,
June 15th, 1854.

NOTES

ON

DISEASES IN TURKEY,

IN REFERENCE TO EUROPEAN TROOPS.

BY

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NOTES

ON

DISEASES IN TURKEY.

THE following pages, which have been written at the request of the Director-General of the Army and Ordnance Medical Department, have not for their object an elaborate discussion on the Ætiology, Prophylaxis, and treatment of the diseases which prevail in and near the Danubian provinces, but are intended simply as a brief and practical outline of my professional experience as to some important differences existing between those countries and England in a medical point of view.

Taking the point where the Danube emerges from the Austrian territory as the apex of a somewhat irregular triangle, divided by that river into halves to the right and left, the portion of the Euxine which lies between Odessa and Bourgas may be considered as its basis, whilst the right side will be flanked by the high mountains of the Balkan from Servia to where they terminate below Varna, and the left by the less elevated branches of the Carpathians, which, running in a semicircular direction through Lesser Wallachia and Moldavia, taper away into the hills of

North Bessarabia. Greater Wallachia, South Moldavia, and South Bessarabia, which compose the left half of the triangle, present an immense plain unrelieved by a single hill. Being unprotected on three sides, this tract lies open to the S.E. wind, and also to the blasts from the N., N.E., and E., which, in the absence of any obstacle, sweep across and over the country on the right side of the river, until they are arrested by the lofty crags of the Balkan. The right half of our triangle is formed entirely by the province of Bulgaria, and bordered on the south by the Balkan. On the other side of this mountainous chain stretches the plateau of Roumelia southwards to the Dardanelles, the Sea of Marmora, and the Bosphorus, and eastwards to the Euxine between Bourgas and Constantinople. Partially open to the N.E. wind, it is chiefly exposed to the E., S.E., S., and S.W.

The Danube, after having broken through the rocky barrier at the apex into a flat country, henceforth flows through a wider channel, which is studded with innumerable islands of a clayey soil covered with brushwood, reed grass, and other water plants, and swarming with musquitos.

After heavy rain, but still more in spring when the snow melts away, the river overflows the islands and shallow banks, turning some parts of the country into swamps many miles in extent, which exhale a very pernicious malaria. Though neither bank is safe from this poison, yet, the left shore being so much lower and flatter, it acts with more intensity there, and renders such places as Kalafat, Rast, Jslasz, Turnul, Simnitza, Giurgevo, Kiernadsy, Cshokaniest, Kallarash, Futestie, &c., very unhealthy during that season. But most dangerous in its effect is the malaria around Cszernawoda, Hirsova, Baba-Dagh, Matschin, Tultscha, and other places in the Dobruzia, at the eastern extremity of

Bulgaria; the same is the case at Brahilou, Galatz, and throughout the Delta formed by the embouchures of the Danube. Nor is the generation of the miasma confined to the Danubian valley, for it is likewise bred by the "Limans" of South Bessarabia; along the shores of the Aluta and the Shyl in Wallachia; in the marshes south-west of Varna; those on either side of the Maritza near Adrianople; not to speak of others of lesser dimensions, and the numerous muddy brooks so frequently to be met with in Bulgaria and Roumelia, which emit a peculiar and offensive smell during the hot season, when they are constantly visited by buffaloes, which wallow in the mire with their muzzles alone above water.

Independently of marshes and swamps, I believe that the alluvial soil of Bulgaria and Roumelia, which, by proper cultivation, might be rendered as salubrious as it is fertile, contains within itself the elements of malaria, which, during the excessive heat, escapes constantly, to the surface through the innumerable cracks formed in the parched meadow land. The changes of the temperature and the seasons are rapid and sudden. The country between Jassy, in Moldavia, and Constantinople, lies between the 43rd and 46th degree north latitude, and yet the temperature ranges from the most excessive heat in summer to 39 degrees below freezing point in winter, and this, too, without the gradual transitions observable elsewhere. The spring, which is very short, is suddenly ushered in by warm breezes, which melt the snow and ice in very little time; the vegetable kingdom, which appeared extinct for many months, begins to germinate and blossom in a few days, and with the end of April every feature of the vernal season is nearly gone. During the summer months, again, there is daily a rapid fall of the thermometer towards the evening, by 15 to 19 degrees Fahr.

Ibrahim Bey, the accomplished son of his late Excellency Zaduc Effendi, with whom I made frequent and distant excursions, told me that in Roumelia the difference was sometimes greater still. The autumnal season begins towards the end of September with thick fogs and tremendous showers, which continue until the N. and N. E. winds, which blow hard in November, clear the sky, and make the atmosphere piercingly cold. I can myself furnish an amusing and instructive instance of these sudden changes, which occurred on the 4th November 1846. After four days' confinement in the quarantine at Giurgevo, the weather having been remarkably fine and cold all the time, I received an early morning visit from the inspecting physician, who came to announce my freedom. No sooner had he glanced at my toilette, which was somewhat more careful than usual, in prospect of some complimentary calls in the town, than he asked—"Are you sufficiently provided with boots, my friend?" I pointed to a few French boots, replying—"That I hated carrying much luggage." "You call this a boot?" shouted he, roaring with laughter, and, taking one of them between his fingers, he led me through the hall, where he had left a pair of overboots of extraordinary size, and opened the entrance door. To my amazement, I found that during the night the snow had already fallen many feet deep. Removal by means of a vehicle was out of the question, and I had to be carried on the shoulders of a powerful porter to the doctor's house, and wait five days before the journey to Bucharest could be attempted. The greater frequency and intensity with which some diseases occur in these provinces must naturally depend upon each and all of the circumstances which have been mentioned, as well as upon the natural productions, diet, occupations, and general mode of living of the population, which shall be referred to in their proper places.

Rheumatism prevails during and after the rainy season among the inhabitants of Bulgaria, nearest to the Danube, and more especially throughout Wallachia, where it assumes a serious character. It occurs also in spring, but with lesser intensity. In the latter country, where, in furtherance of some special object, my friend, Dr. Chevalier de Mayer, physician-in-chief of the Wallachian militia, gave me every facility of inspecting the military hospitals—free access to the civic hospitals being a matter of course—I saw a larger proportion of rheumatic diseases than I ever did before, or since. London comes only next. I had nothing like it at Rustschuck. To avoid repetition, I may state here, once for all, that this is not the only instance of the disproportionate occurrence of certain diseases in these provinces, separated only by a river. The cases which I thus examined, and those which I treated in Bulgaria, were generally those of acute and chronic rheumatism of the joints, frontal rheumatism, facial rheumatism, often affecting one side alone and very painful, and lumbago rheumatica. The class of individuals mostly affected were boatmen, sentinels, travellers, who had the north wind against them, or who rode on horseback during intense cold, and persons exposed to the rain for hours. Occasionally a Turk would send for me, after he had enjoyed a bath. Strangers ought to profit by the example of the inhabitants, who dress much warmer than we do here, and keep the head well covered. Besides the other well-known remedies, I found digitalis, the oxysulphuret of antimony, infusion of juniper berries, and application of tow, fumigated with those berries, of great use in some cases. In the Bosphorus and the Dardanelles, rheumatism frequently occurs in the spring, when the S. E. wind suddenly veers round to N. E., as it sometimes happens in Scutari.

Pleurisy will occur during the autumn, and also in the winter, when the weather is very cold and dry. In spring a great many persons are attacked by it, in localities which are equally accessible to warm and cold winds, and which, by their situation, are favourable to a sudden change of the former into the latter, viz., Varna, Scutari, &c. The reason why the same cause, as before stated, will produce in one individual rheumatism, and pleurisy in another, must be familiar to every medical reader. However, I entertain some doubts as to the reported frequency of the latter disease at Scutari. It is more than likely that many cases of intercostal rheumatism, occurring in highly sensitive subjects, have been put down and rigorously treated for pleurisy, when a simple camphor liniment would have met the case. A fine "friction sound" is very soon heard, when the mind is already made up to find it. At Rustschuck I noticed cases of pleurisy in summer, among boatmen who returned late in the evening; and young persons who had lingered in the vineyards, and exposed themselves to the chilly night dews. They soon yielded to proper treatment.

The physicians of Constantinople, I am afraid, in such cases, use the lancet very freely. Independently of my objection to that practice in general, I sincerely believe that in Turkey it is fraught with mischief, as there is less to be feared from the synochal, than from the tendency to the torpid, character of the disease.

Inflammations of the *uropoetic* system, with their train of symptomatic, or residuary dropsical diseases; also idiopathic anasarca, ascites, and œdematous swelling of the lower extremities, are of great frequency along the Danube, more especially on the Turkish side of the river. Exposure to the heavy rain in autumn, sleeping in the fields, marching in the swamps, sudden check of the perspiration, &c., will cause these disorders.

I wish, moreover, to draw attention to the nephritic and cystic irritations caused by a great many vegetables of an acrid and pungent nature, of which the inhabitants of Bulgaria and Roumelia partake freely, and the acrid principle of which passes through the kidneys. Strangers ought to be cautious, until they get used to them by degrees. The cases are by no means very obstinate; and a judicious selection, according to the nature and cause of the disorder, from among diuretics, hydragogues, diaphoretic drinks, the tartrate of antimony, Dover's powder, hyoscyamus, conium, and dry warmth, will soon restore the normal state. The tiny hot-air bath apparatus, which we use in London, and with which I was not acquainted when in Turkey, would form a most valuable addition to those therapeutical means. Of course dropsies arising from enlargement of the liver or spleen, which are so frequent in marshy districts, and which are the usual sequelæ of ague, must be treated with due regard to their immediate cause. For these enlargements themselves, I generally found an ointment of the iodide of potash, and the internal use of quina, and more especially the decoction of taraxacum, of great service, nor have I had any reason to change this practice to the present day.

I take this opportunity to point out the advantage of avoiding, in that climate, the use of drastics, in dropsical or any other cases, wherever it is practicable to do so. There are already in the Turkish provinces too many agencies abroad, which affect the colon and rectum, to render the increase of their number by one of so powerful a nature a matter of small importance. To cure an evil, without laying the foundation for another, has ever been the prerogative and special province of true medical science.

Rheumatic Iritis, but still more rheumatic and catarrhal ophthalmia, are very common. Amongst other causes, I chiefly noticed: the frequent rheumatic affections of the face and head; long exposure to the light reflected from the snow; the glare of the sun in districts where trees are scarce; the dust of neglected roads; sudden changes of temperature in the summer evenings; and, among villagers, the constant smoke arising from open fire-places, the burning of wood not sufficiently dry, and miserable chimneys. Strangers, from their head-covering, derive some protection, which the fez, the turban, and the high caps without brim, cannot afford. Many of the cases for which I was consulted had already become serious, through the applications of quack and amateur doctors of both sexes, whose existence there, to avoid giving offence at home, I will regard as one of the signs of the progress of Turkish civilization.

Concerning the treatment, I have nothing to say wherein it ought to differ from that adopted in other countries, unless it be that more than usual care must be taken in the purulent stage of the disorder. With the exception of purulent ophthalmia, in which I consider the use of mercury injurious, I invariably ordered a mild mercurial ointment to be rubbed morning and evening around the boundary of the orbit, some distance from the base of the eyelids. In violent nocturnal pain of sclerotitis, I added a few grains of opium to it. Moreover, in the earliest stage of rheumatic ophthalmia and iritis, a strong emetic was given to empty the blood vessels by muscular pressure. The benefit arising from these accessories to the rest of the treatment, and which were recommended to me by high authorities many years since, I consider to be very great. I have seen some cases of purulent ophthalmia in the hospitals of Bucharest, and treated a few in Turkey myself. I cannot too strongly recommend the application of argenti nitras, as suggested by the distinguished oculists of London

and Edinburgh. I only wish I had been in possession of the facts coming from such quarters when I was at Rustschuck. The few successful instances which came to my knowledge were not enough to silence my scruples, so great was my fear of injuring the eye. Only once I attempted just to touch slightly the ulcerated edge of the eye of a "faithful believer," but at his first shriek I felt as if I had committed murder. However, in Turkey this remedial agent will be found of great value in more than one respect. I stated before that purulent ophthalmia will require special care in that country. This is too important a point to be passed over slightly. That inflammation of the conjunctiva will appear more frequently, and with greater severity, among troops constantly exposed to some of the above causes; and that for this very reason even a slighter catarrhal affection of the eye will soon assume the puriform character, is self-evident; moreover, that, in any stage of the disease, an additional aggravation will arise from the crowded state of hospitals in a hot country needs no prophetic voice to foretell. But the evil does not stop there; certainly not in that climate. I believe there is not a medical man, whatever be his opinion about the contagious character of purulent ophthalmia, who will doubt the possibility, nay the strong probability, that under the excessive heat of the provinces on either side of the Balkan, the purulent discharge from the eye will acquire great infecting power, even granting that originally it did not possess it. And if such be the case, where is the safety of hundreds, not to mention larger numbers, unless the strictest precautionary measures are adopted? We have of course no control over wind, dust, and so forth; yet something can be done for the healthy, and with proper care the disease limited to the individuals who suffer under it. I should recommend the soldiers not to use each other's towels when in barracks. This would go a long way; at all events one medium of communication would be stopped both in this and a kindred affection of the eye, arising from a cause which is the same in Western Europe, as it is in Turkey and all the world over. It is also desirable not to wash the face suddenly with cold water, when it is flushed with heat after great fatigue or long exposure to the sun. Even slighter cases of pain or inconvenience in the eye should be attended to without delay; and, if there be no special ward for diseases of the eye, an arrangement than which there could be nothing more desirable, those patients who are under treatment for conjunctivitis in its earlier stage, ought to be put into the least crowded wards, and where there are no cases of disease of a catching character, foul ulcers, or gangrene, whereby the supervention of the purulent stage could be accelerated. However, upon the first appearance of purulent discharge from the eye, the patient ought to be removed at once to a separate ward; or better still to a separate house, destined solely for cases of purulent ophthalmia. The nurses of such a ward or house ought not to wait upon other patients or healthy persons, until they have changed their over dress and thoroughly washed their hands; but the safest plan is, not to permit it under any circumstances. That such a ward ought to have its separate linen, instruments, &c., is clear enough; and also that visitors, if at all admitted, are to be cautioned not to touch the beds.

Though I am of opinion, that infection can only take place upon immediate contact of the purulent matter with a mucous surface, a sore, or wound, yet, and be it spoken in all kindness to both parties, so little reliance do I place, from long observation in various countries, on the discretion of either patients or nurses, that nothing short of the strictest regulations can

satisfy my mind on that score. Moreover, as the virulence and power of propagation of a contagious principle increases in proportion to the number of the patients, and their proximity to each other, only a small number of individuals affected with this purulent secretion ought to be kept in the same ward or house. Both immediate separation and division are required, to stop the further progress of the disease. The difficulty in carrying out this plan, whenever a large proportion of individuals are simultaneously affected, is far from being a valid ground for objection; inasmuch as that circumstance would be the very reason for making every effort to *dilute* the disease in the way suggested. No language I might employ can be too strong or emphatic to urge upon those in authority the necessity of using every means in their power, and not sparing any expense, to avert from the army an evil of such magnitude as the spread of purulent ophthalmia. These views are neither my own nor new, but the importance of the occasion will serve, I trust, as a sufficient excuse for the reiteration. This dangerous disease has so often broken out in military hospitals, since the return of the troops from Egypt under Abercromby, that every medical man is familiar with its treatment; and I would say nothing farther, excepting that, from personal experience, I prefer the lotion of nitrate of silver to an ointment of the same, and also that, whether there be chemosis or not, I should give a very mild ointment of iodide of potassium, instead of that of mercury, referred to above, to be used in the same way and for the same object, viz., to produce absorption of the effusion in the areolar tissue. I have of late years tried cod-liver oil to the eyelids when glued together, and have had reason to be satisfied with the experiment. It is soothing, and, I suppose, less liable to decomposition than salves; if the latter supposition be correct, it would be of some importance in a hot country. I would, at all events, recommend it to my honoured colleagues as worth a trial, and shall feel happy to hear of their approval of my suggestion. In convalescence, I prefer giving bark first, and after a few days, small doses of quina, with ferr. sulph. The rheumatic affections of the eye prevail, I believe, in the left half of the triangle, and catarrhal ophthalmia on the Turkish side; moreover, along the Danube and near the banks of the Maritza, and a few other places similarly situated, swelling of the eyelids, and even inflammation of the eye, are produced by the bites of musquitos, which swarm about at night and disturb the sleep. For these bites honey is used with advantage. I am happy to learn that the Director General, at whose request I write, has honoured me by adopting my suggestion, and has sent to the East some thousand yards of muslin for night covers and bed-curtains. They will be found useful in various ways.

Coup de soleil will more frequently happen with an army of occupation, than with a quiet population, who smoke away the hotter hours of the day beneath the cooling shelter of a kaffaneh. The scarcity of trees in South Bessarabia, Bulgaria, and Roumelia, and the great distance of halting places, towns, and villages, will considerably increase the chances of an attack. The woody neighbourhoods on either side of the Balkan, cooled by the vicinity of high mountains, form an exception. Two individuals, who came under my care, met with a sun-stroke on their way up the Danube in an open boat. I treated the milder case with the cold douche on the head, the rest of the body being well wrapped up: it was a lingering case. The second, which manifested all the symptoms of acute encephalitis, was bled to syncope, and recovered in much shorter time.

An interesting and analogous instance, not of stroke by

the sun, but by fire, when encephalitis and ophthalmia were caused in an individual, who had remained too long in a burning house, occurred to me in Bucharest. As it was impracticable to open a vein, I applied at once forty leeches, some distance from the head, and kept up the bleeding until faintness ensued. The effect was marked and surprising. I am far from being an advocate of blood-letting, rather the reverse; but I am certain that, in cases like this and the preceding, blood must be taken in large quantity in *one* bleeding, and without delay. Life hangs upon a moment. Repeated instances of sun-stroke have been communicated to me by other practitioners in Turkey, so that a good supply of tents for a division on its march would be of service, and, at all events, protect against other inconveniences produced by sultry heat. That it is desirable to give such patients acidulated potations, clear the bowels by an enema, and empty the bladder by means of the catheter, hardly needs mentioning.

Boils occur oftener on the right than on the left side of the triangle, making allowance for the Wallachian hospitals. In time of war they will, of course, break out more frequently, especially among individuals of delicate skin like the English. Involving no danger, and of daily occurrence in this country, I should not have taken notice of the disorder in this pamphlet, but for a desire of expressing my opinion, that in their treatment, poulticing and cutting the tumour, however large, might be entirely dispensed with—an advantage which ought ever to be borne in mind in Turkish hospital practice when it can be obtained. I always found, that passing solid lunar caustic, made previously wet, round the furuncle, will soon cause it to die within the artificial boundary, and that tracing a cross over the surface of the boil will hasten its decay. Whenever the boil breaks open, it is quite sufficient to dip the caustic into the hole once, and carry it round the edge of the abscess. This plan, supported by the usual internal treatment, will succeed with boils of the largest size, even when sloughing has already taken place. I regret I did not pay earlier attention at Rustschuck to the connection which I think exists between boils and the consumption of swine's flesh. I had ample opportunities for such an investigation by virtue of my appointment as physician to the four corporations of the Greeks, Armenians, Jews, and Turks, the latter two of whom abstain entirely from that food. However, when I first became interested in the question, it was too late to gather sufficient data to come to a satisfactory conclusion on the matter.

Pneumonia and *Bronchitis* do not offer, according to my opinion, any striking characteristics of difference, either as regards their proximate causes, or the course of their symptoms, from what we daily observe in this country—hence it would be quite out of the scope of this tract to say more about them than that, of the two, Pneumonia prevails in the left half of the triangle, especially with the wind from the N. E., as may be easily imagined; whilst bronchitis is more frequent in the right half, particularly in summer time, owing to the damp and chilly evenings after the excessive heat during daytime. The smoking of narcotic plants by means of the narghilé (water-pipe) in distressing bronchitical and asthmatic cough, will be considered by our medical men an improvement upon the narcotic inhalations proposed by some practitioners here.

Ague is a Turkish disease, *par excellence;* in England it is now-a-days quite a rarity; and unless one pays a visit to the neighbourhoods of Snaith or Horncastle, or some of the fens of Essex or Norfolk, there is very little chance of meeting with it. In this country the temperature is not sufficiently high, and the land too well cultivated, to favour the development of that kind of malaria which is the chief source of intermittent fever. In the Danubian provinces, on the contrary, which are comprised in the triangle, as well as in Roumelia, there exist all the atmospheric and topographical conditions for malaria, and all the predisposing and exciting causes, which facilitate the appearance of the disease, such as excessive heat, a long summer, sudden succession of the seasons without preparatory transition, great fall of the temperature in summer evenings, night dews, damp air and fogs, rapid melting of large masses of snow containing vegetable matter, heavy showers, frequent inundations and formation of swamps, shallowness of the banks of the Danube and other rivers, an extensive delta, brackish water near the sea, especially on the southern coast of Roumelia, clayey soil in one province, alluvial in a second, volcanic in a third (*e. g.* near Philipopolis), a great number of water plants, rank vegetation, want of drainage and of cultivation in general, abundance of acidulous fruits and vegetables containing a large proportion of aqueous principles, and again others of an acrid nature, which none but natives can digest. This great variety of external influences, many of which co-exist in one locality, brings them necessarily into contact with almost all the important organs, which, standing in close connection with the nervous and the ganglionic centres in particular, form the channels through which these centres become pre-disposed to the action of the proximate cause of ague, *viz.* malaria. The chances of affection by, or escape from the disease, will therefore primarily stand in proportion to the more or less vigorous resistance which the mediatorial organs can offer to those external influences. Hence whenever, from want of caution, force of circumstances, or a naturally weak condition of any of these organs, their resisting power is impaired, or, technically speaking, their receptivity increased, the liability to an attack becomes so much greater; for this reason fatigue of the muscles by over exertion, of the nerves by anxiety and fear, exposure of the skin to vicissitudes of heat and chill, &c., will, in an especial manner, expose those organs, and through them the nervous centres, to the influence of external causes, thus rendering the latter particularly liable to be affected by the malaria poison. From this it is evident, that, of all men, a soldier in time of war will be most exposed to attacks of ague. Excitement, sleepless nights, long and fatiguing marches, irregular meals, fasting, improper food, encampment in the open field, slight indisposition, &c., will be so many items against him. But though we cannot protect him against a shower, or shelter him from the burning sun, many expedients may be suggested whereby much may be avoided, or the unavoidable better borne. But to this we shall refer in its proper place.

In books the ague appears in spring and autumn, in Turkey all the year round, though by far more frequently at those seasons. I mention this solely as a warning against imprudence to those non-professional readers, who do not despise a well meant hint; and to medical men, that they may not relax in their treatment of the convalescent because the autumnal season is over; for a relapse is as likely in winter time as in spring or summer, and relapse from ague in Turkey is certain, if the treatment terminate too soon. Nobody of course will literally accept the theory, which places the quartan ague in the autumn, the quotidian and tertian in spring. In Turkey a large margin must be left for exceptions, at least I have observed all these types at either season, though I must admit that I have seen a larger proportion of quartan fever in autumn than in

spring. I cannot say the same of the quotidian and tertian ague. I am inclined to think that the season has not quite so much to do with the period of intermission, and that the latter is greatly regulated by the constitution of the individual, which *cæteris paribus* modifies the rhythmical return of the paroxysm, and makes it a quartan or a tertian. I come to this conclusion from the circumstance that all quartan agues which I had to treat, whether vernal or autumnal, had a decided tendency to torpor, and the quotidian to an inflammatory character independently of the season. This I can only explain upon constitutional grounds, and consider it, therefore, fair reasoning that if the constitution has an influence upon the tendency, it most probably has a share in the formation of the type of the ague. The same assumption furnished the reason why quartan agues appear in spring at all, and *vice versâ*. This, however, is merely a private impression, which can be of practical value only as far as it may perhaps indicate the kind of treatment which ought to be entered upon.

By paying attention to the premonitory symptoms of ague, it is quite possible to quell the disorder in its birth. Whenever there is headache, giddiness, oppression over the stomach, feeling of sickness, lassitude, stretching of limbs, yawning, it is well to inquire after the immediate cause, and act accordingly. An emetic of ipecac., if the symptoms occur soon after a heavy meal, or eating melons, cucumbers, &c.; rubbing the limbs with hot flannel, and camphor powder if after great exertion; friction with flannel, foot bath, Dover's powder, potations of tepid water flavoured with lemon juice, if the symptoms have been caused by rain, or a chill, were the means I generally adopted, together with a mild aperient of rheum, or rheum and senna, and two grains of quina four times in the day. The latter I continued three or four days. Such and similar means will generally suffice to prevent a paroxysm of ague. The stages of Turkish ague are generally well marked. It is of the highest importance for speedy recovery, and especially in the quartan ague, because of its tendency to typhus, to shorten the cold stage; next to this, the hot stage of the quotidian and double tertian deserve greatest attention. I generally pursued the following plan:—In the cold stage the body was rubbed with warm flannels, and bottles with hot water or sand put in the bed (the hot-air bath instrument would again be of excellent service); internally, frequent potations of warm infusion of orange peel, warm lemonade, warm toast-water; in quartan ague, a few drops of the solution of acetate of ammonia occasionally, in a cup of a weak infusion of camomilla—mustard poultices to the lower extremities. I have seen the warm douche applied with good results. I should also think that chloroform given internally, in small quantity, would considerably shorten that stage. In the hot stage, if moderate, the patient was left quiet. In exorbitant heat, with flushed face and headache, a waterproof bag with cold water was applied to the head; internally, tepid lemonade and toast-water, and in very severe attacks an opiate. In the sweating stage the scanty perspiration was promoted by Dover's powder and warm drinks, otherwise the patient was left undisturbed. Great caution was enjoined with the change of linen. During the intermission the patient took twenty-four grains of quina within the day, beginning with the fourth hour from the termination of the paroxysm. If it disagreed, a lesser quantity was given, and supported by the following powder:—Pulveris corticis salicis albæ ℈ i. Pulveris corticis aurant. Pulveris radicis acori āā ℈ ss. Sumatur omni quarta hora. The bowels were kept freely open by rheum and senna. In irritable stomach, an occa-

sional enema. Light diet of pulpy and fluid consistence. Now and then an infusion of camomile, or radix acori. The latter I found extremely useful in quartan ague, with weakness of digestion. The acorus and the cortex salicis albæ are to be met with everywhere in Turkey, and are excellent remedies in ague. The trifolium fibrinum stands likewise in good reputation; I have not tried it more than twice. By this treatment the paroxysms became invariably milder, and generally soon left altogether, when the above powder, with gradually diminished doses of quina, were persevered in for a month or two. I never tried arsenic in intermittens, but I consider the plan which I adopted quite sufficient, especially if care be taken to regulate the dose of quina by the receptivity of the stomach; inasmuch as doses, which are not well borne, are rather hurtful than otherwise. That the patient must be particularly warned against errors in diet, exposure to draught, rain, heat, &c., is a matter of course. I have some objection to the use of buffalo milk for convalescents. I am quite certain that with a great many it did not agree. It is extremely rich in oleagineous principles, and if poured out of a cup, the latter will be found coated by an oily, sticky liquid. The inhabitants use a variety of things for the ague, amongst which pepper with brandy is the most in repute. These stimulating medicines are altogether objectionable. Various means have been proposed to prevent the ague. In Turkey they use amulets; Hahnemann recommends the billionth part of a grain of bark, others again advise repeated small doses of quina, and there are some who suggest quina bags, to be worn near the skin. Considering all circumstances, I must give the prize to the amulet.

The true prophylaxis of ague can only consist in the avoidance of deleterious influences; and whatever I may say on this subject, applies to the remittent and so-called continued fever of the Dobruzia with double force. The following, I believe, comprehends all that is required:—The dress ought to be warm and easy. Flannel is indispensable; even the inured natives wear it. Those who can afford the luxury of a silk shirt, will find it an excellent absorbent of the moisture of the skin. Exposure to the air during the early part of the morning, or the evening, is injurious; if unavoidable, the body ought to be wrapped in a large cloak, covering the face; neither is it prudent to sit or lie down on the grass, though it be dry, without spreading something underneath the body and feet. In the evening, and during the night, even that protection will be insufficient. Sitting in a draught, or at the open window, sleeping with open doors or windows, throwing off the bed-cover at night-time, putting the naked foot on the ground, unbuttoning the waistcoat, or taking off the coat or hat whilst walking, or the dress, immediately after returning from a march, are highly objectionable.

In the latter case it is expedient, when circumstances allow, to walk about in the room for a while, undressing by and by, and rubbing the skin dry with a flannel. Wet boots and clothes, however, ought to be changed without delay. In districts which are notorious for malaria, it is advisable to give a good shake to every article of dress, especially woollens, before putting them on. It is not wise to hang them out for an airing over night; daytime is preferable. Every change of linen is to be well aired. The practice by the natives of going to the well in the yard for a wash is certainly not to be imitated. Sudden transitions are as much as possible to be avoided, such as sitting down immediately after strong exercise, taking cold drink, or going at once to a cool place whilst the skin is perspiring or very hot. Simplicity in diet, and avoidance of strong

alcoholic liquors, are of highest importance. Regular hours for meals, if practicable, taking food in moderate quantity at a time and masticating it well, avoiding the habit of taking pastry, tea, &c., whilst hot, will greatly assist in keeping the digestive organs in good order, which is one of the safest amulets. To go out in the morning without breakfast, or in the evening many hours after a meal, is certainly prejudicial. During the first two months no kind of vegetable ought to be taken in a raw state. Vegetables containing mucilage will agree well with a little pepper added to them; those of an acrid nature and cucumbers are better not taken at all; neither can I speak well of baked kukuruz, which causes a great deal of flatulence. Pork in Bulgaria and Roumelia is not wholesome, and the meat of buffaloes is very tough, and requires a strong stomach. Goat and mutton is light and agreeable, and very good for a change. Game is excellent, and so is fish, especially a species of pilchard caught near Varna and along that shore. It is at all times advisable to take fruit with great moderation; the better class of the inhabitants follow this rule. Melons and plums ought not to be taken by strangers for a long time; pears and apples are less objectionable, but grapes are better still. A slice of a peach with a little pepper over it, or soaked in wine, may pass; dried figs, of which there is a great abundance, act as a mild aperient on the bowels, and are very suitable after dinner; nor is there any objection to the dulciazza, a kind of marmalade, especially if made of orange-peel, and taken in the morning with a cup of tea. Nuts lie heavy on the stomach, but a few almonds will do, and one bitter almond after a meal will be found as good a protective against ague as quina taken internally, or worn in a bag. In Wallachia less restriction in diet is necessary. The meat and vegetables are of first-rate description, and the wine is excellent; fish is rather rich, and ought never to be taken freely.

There are very few individuals with whom the water of a foreign country agrees at first; such is the case with Turkey; and inasmuch as anything that disagrees predisposes for ague, it deserves consideration. In the swampish districts of the Dobruzia and the Delta the water is generally bad; however it must not be understood that there are no good wells in the villages and towns; but they are not sufficient for a large supply, especially upon a sudden increase of water drinkers, such as an invading army. On the south of the Dobruzia, towards the Trajan wall, and on the west of it towards Silistria, the water is good again. The water close upon the southern shore of Roumelia, *e. g.* at Gallipolis, or Enos Bay, is brackish; but a little higher up, sometimes only a quarter of a mile distance, it is sweet. As for the rest of Turkey, as far as my information goes, I believe there is not a place which has not good wells, and in some of the towns on the right bank of the Danube, such as Nicopolis, Sistova, Rustschuck, Silistria, which stand upon lime ground, the water is excellent. Again, on the roads which cross the country, wells are to be found every few miles distance; I tasted it myself on my excursions with the Pasha on the roads leading to Schumla, Tirnova, and other places, and found it very palatable. Between the rice districts in the north of Bulgaria and the Balkan, the water is likewise good. The bad water of some wells becomes only so by neglect, when they are left uncovered, and all sorts of animal and vegetable matter accumulate in them. I am sure, that where this is the case, it would not give more than a few hours trouble to clean them and keep them sweet, if soldiers should be located in such a place. There is, therefore, no necessity for filtering. I think that

in the bad districts they use stone filters found in the country; however, I cannot vouch for the correctness of my recollections on that subject. The following rules may be of some use. The first few pails of water drawn from a well in the morning ought to be poured away, before the water is used for drinking. A very few drops of brandy added to a tumbler of water will prevent any injurious effect it might have upon a foreigner. What I consider a better plan still, is to mix with the water a teaspoonful or two of the infusion of acorus, prepared either with cold or hot water, or with equal quantities of cold water and spirit of wine, or with wine alone. This infusion, especially the latter, is most agreeable and wholesome. By the addition of a little orange peel it gets a most delicious flavour. The warm infusion requires a few hours, and that with cold water or wine four days, before it is fit for use, and will keep for months. I cannot leave this subject without expressing my conviction, that those who are in the habit of taking brandy in larger quantity, a habit in itself injurious in malarious districts, may increase the injury by carrying it with them in vessels made of a substance, which allows of impregnation by fuzel, and I think that none but glass flasks will prevent that. This fuzel will impart its smell and qualities to every fresh supply of brandy, or any other beverage; and however individuals may get used to the former, they ought to be informed that there are few things in the world more calculated to undermine health, and, as far as Turkey is concerned, to predispose for ague and remittent fevers, than that very fuzel. I feel confident that the fuzel, created in the miserable bottle used by the Russian soldier, has been one chief cause of the heavy sick list in former years in that army.

Malaria, so productive of ague, is likewise the cause of those dangerous fevers which, at the close of spring and in the early summer, absolutely reign in the Dobruzia and the Delta, and prevail to a certain extent on the banks of the Maritza. These fevers are very severe. However, there is a great deal of unnecessary apprehension about them in the mind of the medical public and elsewhere, which I deem it my duty to dissipate as far as I can by examining the grounds on which those fears rest. These fevers appear at the time when the swamps begin to dry up; the quicker this process goes on—that is to say, the hotter the weather is—the greater will be the number of persons affected, and the disease so much the more intense. Now that was exactly the case with the Russian army in 1829, which encamped in those regions just at the period of the greatest evaporization. Add to this the lamentable condition of the Russian soldier at that time, who, even according to their own accounts, is described as having been half clad, half starved, or living on the most miserable food; and the liability for attacks from malaria, according to what I have already stated, must have been at its height. Again let it be considered that the medical officers were altogether unprepared for the emergency, both as regards their store of knowledge and their medical stores, and the treatment may be easily imagined. Now, typhus and plague are very accommodating terms on occasions of such a mortality as existed then, which, although attributed to those diseases, I believe to have mainly resulted from a different cause; and however humane the feeling which induced the Emperor to shed tears over the loss of his soldiers, such sympathy might have been more beneficially expressed by supplying his army with medical men capable of forming a correct diagnosis; for I maintain that by a proper knowledge of the disease alone, not to speak of other means, the evil would never have

arrived at half its magnitude, and that the majority of cases were neither typhus nor plague, but febris remittens, the bastard child of ague, which, in its severest forms, appears as continued fever, which mostly attacked those Russian soldiers, and for which they ought to have been treated. Now, this memorable disaster of the Russian campaign has left a lasting impression, both upon people on the spot and abroad. Nor has the matter ever been fairly investigated. Medical and other travellers go by steamer from Constantinople to Galatz, and again from thence to some other distant station. They never spend a day in the Dobruzia or the Delta—a journey by land to the shores of the Maritza being quite out of the question. As the river is not navigable before spring, of course they will always arrive at the time of greater mortality, and hear it still accounted for in a manner which is tinged with those Russian recollections. It is by such reports reaching this country that the public have become alarmed; but I would ask, what analogy can exist between the Russian army of 1829 and our noble division in the East, with ample provision of every kind, commanded by officers who take care of their men, and watched by an intelligent, well-informed, and indefatigable medical staff, to justify an inference from the former case to the latter? We know that remittent fever is a severe disease, and that the intensity of the miasma in some places makes it particularly so; but we also know that the one may be cured and the other escaped. Exaggerated fear and under-estimation of a danger are equally unprofitable. During my first interview with the Director-General, when, amongst others, this point became the subject of conversation, he fully admitted that the campaign of 1829 was not a fair ground to argue from.

Remittent fever occurs in almost every part of Turkey, as one would naturally suppose, inasmuch as it owns the same origin as ague. Much milder in towns than in country places, it appears in its worst features during the early summer in the Delta, Dobruzia, and those parts of the country where there are large morasses. In severer cases, its intermissions are very short and indistinct, and soon cease altogether, when it is justly called a continued fever; very often the disease breaks out in the latter form at once. It is unfortunate that the term "continued fever" is also used for typhus. To prevent mistake, I wish to be understood, that in this paper the term is applied solely to a fever created by marsh-miasma, differing from remittent fever only in degree and intensity, just as the remittent fever differs from ague solely by shorter intervals, and those constitutional disturbances which arise from protracted paroxysms. Nor are there cases wanting of obstinate or neglected agues, which run into remittent, and terminate fatally with continued fever. In fact, it will depend entirely upon local circumstances, the intensity of the miasma, the constitution of the patient, the kind and duration of the exposure, whether the malaria produces the mildest or severest form of this class of disease. Nor does what we can learn, *de juvantibus et nocentibus*, contradict this supposition; for remittent fever did certainly improve upon judicious use of quina, just as ague did, nor can I imagine that much good can be done in the continued marsh fever without that remedy. For the sake of brevity, and also because in severer cases (and of such alone do I speak) there is very little difference between the remittent and continued fever, I shall speak of both under the same head. The main features of the remittent and first stage of continued fever, as far as I could ascertain from my own cases, and from trustworthy verbal communications by some Wallachian physicians, are:—Great general debility and depression; constant headache; flushed face; pulse soft, feeble,

accelerated; skin dry and hot, with occasional sweats breaking out over the upper part of the trunk; great oppression and distress over the precordial region; feeling of sickness; tongue moist, and covered with a yellowish coating; great thirst; constipation; scanty urine; a feeling as if the limbs were bruised; sometimes a look full of deep anxiety and distress, altogether peculiar; now and then a slight shiver, when the patient buries himself under the cover with a sigh — sighing is a very frequent symptom. One feature, which I well recollect, and which is quite the reverse of typhus, is, that the subjective heat, as felt by the patient, appears greater than the objective heat discovered by the exploring hand. The patient constantly seeks the coolest part of the bed, and feels gratified if anything cold is placed in his hands. In typhus, on the contrary, the medical man *feels* the "calor mordax," whilst the patient does not appear to do so. The greater affection of the sensorium in the latter disease is probably the reason of this phenomenon. However, I would caution the reader against taking this symptom as a criterion between the two diseases. Farther observations must determine whether it is of any value. During the short intermission this feeling of heat greatly subsides.

If medical aid is called in early enough, the progress of the disease may be stayed. Care must first be given to the predisposing cause, such as checked perspiration, undigested food, by applying the appropriate means; then quina every second hour, and a draught of infusion of camomile and radix acori, with three or four grains of sal ammonia twice daily, and the bowels attended to by injections. Quina is borne far better than the above symptoms would lead to suppose. Removal from the spot where infection by malaria was received, when practicable, will greatly contribute towards recovery. Application of cold to the head, diluted tepid drinks acidulated with lemon juice or the elixir. acid. Halleri, will be agreeable to the patient, and in harmony with the imminent second stage of the disease. The crisis generally manifests itself by perspiration of the whole body, which must be supported by beef-tea and other drinks. I have seen on one occasion the disease terminate in a quotidiana with short paroxysms. But the most difficult and tedious task is to carry the patient safely through the state of convalescence, and I really believe that in hospitals these cases will do far better than they can in private practice. It is not often that the physician has the opportunity of seeing much of the first stage, as it is only of three or four days' duration, and the seizure generally takes place under circumstances which hardly permit the patient to be brought under medical care as soon as might be wished. Towards the close of that stage some nervous symptoms make their appearance, as increased debility, slight aberrations of mind, subsultus tendinum. These are the forerunners of the second stage, which is fast approaching, and indicate the necessity of some change in the treatment. Nature will do nothing in these cases by itself; if left alone, the patients invariably die. The following is an instance of the rapid progress of the disease, and likewise affords an illustration of the degree in which accompanying circumstances influence the severity of infection by malaria. At the end of June I was called to a gentleman of the Jewish persuasion, who had been below Silistria with a party of Gentile friends, to superintend the forwarding of corn to Galatz, which was stapled up near the shore. For a few nights they slept on the spot to guard their property. Nearly all of them got the ague in consequence, but my patient who, from religious scruples, had lived entirely upon bread and coffee for nearly a fortnight, was seized with violent continued fever. I saw

him forty hours after he had been taken ill, when alarming nervous symptoms had already set in. Fourteen hours later various parts of the body were covered with blackish spots, varying in size, some of them flat, and others a little raised above the surface. I could not help thinking that, had the man lived on more substantial food, he might have escaped with an ague or a milder form of fever. As soon as such nervous symptoms have become apparent, those of decomposition of the blood are not long absent, sometimes not more than eight or ten hours, as shown by the eruption of petechiæ of a dark colour, or large black spots as in the above case. These eruptions are accompanied by delirium, tympanitic abdomen, rapid sinking, gangrene; sometimes bleeding from the nose, and diarrhœa.

From these symptoms, and the locality where it occurs with greatest severity, it has been called—continued, petechial, putrid, gangrenous, or Dobruzia, fever. Though I had various remedies recommended, my confidence rests alone in *arnica montana;* but to have its full effect the flowers must be given in a decocto-infusum, with a little sesquicarb. of ammonia or sulphuric ether, for example, *R. Florum arnicæ,* ʒ j, *coque cum suff. quant. aquæ per* $\frac{3}{4}$ *horæ; cum decocto adhuc calente infunde, florum arnicæ* ʒ j; *stet in infusione per* $\frac{1}{4}$ *horæ in vase clauso. Colaturæ,* ℥ vj, *adde spir.aeth. sulph.* ℈ j. *Capiat* ℥ ss. *omni hora.* The extract of arnica is not of the slightest use. As soon as the nervous symptoms make their appearance, arnica ought to be given in some such form and persevered in, and the quina continued, though at far greater intervals, and in much smaller doses. The potations ought to contain small quantities of dilute sulph. or phosphoric acid, or elixir. acid. Halleri. If there is great diarrhœa, the radix arnicæ would be advantageously added to the infusion—gangrenescent places will often improve upon slight application of caustic. By this mode of treatment, and support from strong nourishing beef-tea, I venture to say that the worst cases need not be despaired of, unless medical aid has been called in when it was too late, and when death will come on more or less rapidly, the whole duration of the severer forms being from five to twelve days. My opinion has been asked about the efficacy of Warburg's drops in this disease. I know that remedy by name, but certainly never heard it mentioned either in Bulgaria or Wallachia. Neither do I recollect that these drops occur in the Austrian Pharmacopœia, with which during my practice at Prague, Vienna, and Venice, I ought to have become acquainted. I have not the slightest doubt that they are good for something, as is the case with all extraordinary pills, tinctures, balms, &c.; or the distinguished physicians, of whose prescriptions they are the mystified reproduction, would not have deserved their fame. *Quæ non fecimus ipsi, vix ea* nostra *voco.* At all events I never heard of them in connection with the Dobruzia fever. I believe what has been stated concerning the proximate cause, occasional return of slight shivers, state of the tongue, and deportment of the patient, will suffice to prevent this disease being at the outset mistaken for typhus. Whoever has paid attention to the helpless and prostrate posture of a typhus patient in his bed, *trunci instar*, will at the first glance discover whether the case belong to the one or the other. To enter into farther detail of symptomatology and treatment would be mere waste of time; much must be left to the judgment of the medical man, nor can the most minute treatise ever supply this quality. In the absence of *p. m.* examinations to guide me, I preferred pointing out the most striking features that occurred to me, and shall be happy to learn that no grave omission has been made in the short outline which I have given.

Where there is ague, *dysentery* is not far off, the former predisposing for the latter by the disorders which it produces in the abdominal organs. Even a superficial perusal of the preceding pages will show that the exciting causes of this "scourge of armies," are extremely numerous: sudden fall of the temperature in summer evenings: protracted autumnal rains following great heat, &c. It will occur in spring, but chiefly in summer and autumn, in consequence of exposure in the swamps, sleeping in the fields, sitting on the grass late in the evening, or after free indulgence in cucumbers, plums, or imprudent use of drastic medicines, such as are contained in many patent pills. It appears under either form of *dysenteria mucosa* or *sanguinosa;* pain and tenesmus are considerable, and often accompanied by febrile symptoms. My chief object in referring to this disease is to draw attention to the great tendency to typhoid fevers which characterize it in Turkey; a circumstance especially important to those who are in the habit of treating it with leeches and calomel. The few severer cases which fell under my care did very well upon *pulvis Doveri*, friction of *oleum hyoscyami coctum* over the abdomen, light mucilaginous food, and keeping in an equal temperature. That the ague on one hand, and dysentery on the other, will leave behind them tokens of their visits by liver affections, every one will readily believe.

I have already alluded to my treatment of enlarged liver. If there are liver abscesses formed after dysentery, they are better not interfered with surgically, although they may be superficially situated; they will have their own way after all. *Peritonitis*, *Enteritis*, and *Colonitis*, I solely mention to warn against mistaking rheumatic affections, which are so apt in Turkey to seize the serous covering and muscular coats of the intestinal tube, for the above inflammations, which are constantly occurring. Where they really take place, the typhoid tendency of these inflammations must again be borne in mind. From long experience in England and abroad, I feel convinced that many such cases are the worse for over doing; and that a little patience in awaiting the effect of hot fomentations by decoction of poppies, and other most obvious means, will save much trouble, and many a life too.

Diarrhœa deserves notice chiefly on account of its frequency. Severer cases must be treated according to their proximate cause, which is very frequently some organic disorder. However, talking about treatment of alvine fluxes is dangerous ground, for even practitioners who would abhor empiricism in any other disease, patronize some "capital medicine," and will recommend it in diarrhœa, whatever be the pathology of the case. This is a professional weakness; thus we hear in cholera of opium, pepper, chalk mixture, catechu, sulphuric acid, calomel, and the brandy bottle of course, which cause nothing but confusion and uncertainty in the management of a disorder, the treatment of which I consider both simple and easy. The impaired tone of the bowels consequent upon some of the foregoing diseases, and which is so productive of diarrhœa, will greatly improve, upon the use of infusion of camomile, acorus, the extract of chelidonium, or of centaurium minus. Good and dry boots are a chief desideratum; and I also think that our gallant Highlanders will find it both useful and agreeable to imitate the native mountaineers, and take to their leggings. In fact, immunity from any of the above abdominal disorders, without due regard to those precautions which I have not spared in this paper, is impossible in that climate. The natives themselves, who are as hardy and inured as any nation in the world, are fully aware of this. In the tremendous conflagration of Bucharest, Easter Sunday, Old Style, 1847, when 10,000 and

more individuals were rendered houseless, the number of intestinal diseases caused by the want of shelter in one night was really enormous. I myself saw a great many such cases the following day. Those of my readers who may have the privilege of meeting with my much honoured friend, Robert Colquhoun, Esq., Her Majesty's Consul General, who I am sure will bear testimony to my recollections, may receive from him most valuable information, concerning the necessity of not trifling with the weather in those provinces. Self indulgence may not become a soldier, but equally unbecoming is wanton neglect of self in a true defender of his country.

I have seen two cases of sporadic *plague*, one of which occurred in Rustschuck. The particulars of this disease have been treated by some English authors in so masterly a manner, that it would be more than presumption on my part to say a single word about it. Still I would suggest to those who may happen to meet with a case, to try turpentine internally. The hitherto unsuccessful treatment of plague renders it quite consistent with my great respect for those distinguished authors, to make such a suggestion.

I should not think that *scurvy* will be very frequent among the English troops; neither do I suppose they will render themselves liable to the injurious effects of Opium.

Typhus and *typhoid fever* I notice solely on account of the foremost rank which they occupy in the annals of human disease, but not for any of those differences which alone form the subject of this paper. That the sources of these fevers abound in the Danubian provinces to an extraordinary degree is evident. The climate, after relaxing the constitution by enervating influences, not unfrequently changes to Scythian severity. By this change it may become the direct cause of such fevers, as well as produce them indirectly, by giving rise to those serious disorders which dispose the system to the creation of typhus poison in the body. Nature, moreover, so prolific in its productive powers, uncontrolled by the care and diligence of the husbandman, exuberates in noxious weed and an ill-developed produce—thus adding to the evils of a capricious sky, where it might otherwise have mitigated them; and, lastly, as in this country the seed of the disease is fostered by misery and crime in the lower, and by the exciting and eager pursuits after wealth, distinction, and pleasure in the higher ranks, so will oppression and slavish fear, oriental indulgence, and total want of nobler aspirations, have a similar effect there. In fact, to produce typhus, the sky, the soil, and the folly of man, must contribute their quota.

The symptoms of typhus present a remarkable similarity in all countries. At least as far as my observation goes, it always exhibited the same stereotyped features, wherever I happened to treat it; the heavy showers in Turkey, the sirocco brooding over the lagunes of Venice, and the fogs and wretched courts and alleys of London, may aggravate, but they cannot alter its appearance. Though cases of typhus and typhoid fever occur frequently throughout the year, yet during autumn and the first two winter months they are greatly on the increase, both in Turkey and Wallachia. The rosy-coloured eruptions of typhoid fever appear at that season of a darker hue, as we often observe it in the mulberry-rash in the wards of the London hospitals. In the absence of autopsies I cannot but with some reserve repeat my opinion, that these fevers are not identical with the spring-fevers which I described before. At all events, the latter are caused solely by marsh-miasma, are not contagious, and yield to quinine and arnica, neither of which can be said of typhus fevers which occur at the same time or afterwards.

When in Turkey, I could not quite coincide with the treatment generally adopted. Some practitioners were even in the habit of giving tartrate of antimony in the beginning of the disease. When I passed the clinical examination for license of practice in Bucharest and Wallachia, I urged my objections to that plan; and in honour to the president and the members of the examining body, I must state, that they left me quite at liberty to follow my own views. What I observed before concerning the similarity of the essential features, applies as well to the treatment of those diseases. I cannot conceive of any difference.

The other day a medical officer proceeding to the East, asked my opinion respecting the best treatment of typhus in Turkey. I recommended him that which he considered the best in England. Whilst in marsh-fever medicinal interference alone can do good, in typhus such is not the case. No disease requires more judgment and tact on the part of the medical man, and less medicine, than typhus, whether in London or abroad; it is by many littles that he carries the patient through, and I feel satisfied, that since the search for a specific has cooled down, mortality has wonderfully decreased. I gave in Turkey, ammonia, camphor, strong beef-tea, and the best red wine I could get; and, with the exception of camphor, I have not changed this bill of fare to the present day. In one of our metropolitan hospitals brandy has been proposed. I tried it repeatedly in the Royal General Dispensary and in private, but returned to port wine, using brandy solely when symptoms of extreme faintness are coming on. In parotidal swellings I ordered warm fomentations, with bags containing powdered camomile, and camphor rubbed on the surface. Ulcerations of the tonsils, which occurred in typhus, I treated with a weak gargle of diluted sulph. acid. Both applications generally answered well. In hospital practice, it is necessary in those provinces to allow as large a space as possible between the beds, and to avoid poulticing whenever the object can be attained by other means. It may be as well to mention, that a forced march, or a draught of cold water taken when the body is very hot, have often been followed by an attack of typhus fever.

I cannot close these remarks without an allusion to the most productive, though quite accidental, cause of typhus fevers. I refer to war. Its baneful influence in increasing these diseases was well known to earlier medical writers. Thus Huxham speaks of "Febris bellaris." The same is acknowledged by modern authors, and corroborated by the typhus epidemic raging in 1812, 1813, 1814. But whilst medical research furnishes us with the statistics of these melancholy facts, our minds are relieved from anxiety by the assurance, that the disease will carry terror and death into the ranks of a disheartened and retreating foe, but that a victorious army will have its strength recruited, and its health restored, by the laurel's verdant leaves.

In conclusion I beg to make the following general observations:—With the exception of Lesser Wallachia the roads throughout European Turkey are very inferior; during winter and in the beginning of spring they are often quite impracticable. In Bulgaria the main roads run between Varna, Silistria, Schumla, Trnova, Turtukai, Rustschuck, Nicopolis, Widdin, &c.; these places communicate again with smaller localities by very indifferent highways. Considering the great difficulty of transit, hospitals ought to be established in those towns only which command the easiest communication. Among these the towns on the western shore of the Euxine, such as Varna, Bourgas, &c., will be constantly accessible. Next to them come the towns just mentioned, which are comparatively healthy. The low

situation of Widdin is rather against it, but half a mile south the air is good. With the exception of Schumla and Trnova, all these places are situated on the right bank of the Danube, and have the advantage of navigation during the greater part of the year. They are much healthier than the localities on the opposite shore; but below Silistria it would not be advisable to establish hospitals at all, unless for the most cogent reasons. For a depôt-hospital, Rustschuck commands greater advantages, than any other place. It is very healthy, has a large population, and offers ample accommodation; it is, moreover, easy of access even for vessels of 500 tons burden, and lies opposite the important Wallachian town of Giurgevo, which, being in a direct line with Bucharest, renders it an important place for provisions. Rustschuck is likewise the nearest frontier town to Schumla, and draws supplies of every description from Trnova and other places which flank it to the right and left; and as it is situated on the main road of the land route between Constantinople, Adrianople, Schumla, and Bucharest, and is one of the principal stations of the steam navigation on the Turkish Danube, the facilities of transport are greater there than anywhere else. In case of need, some of the smaller localities situated on the above mentioned main roads, *e. g.* Bashardshick, might be eligible for temporary hospitals. In Roumelia, Adrianople is certainly the most convenient place for hospital purposes, By a tolerably good road it communicates with Constantinople, by another with Schumla; and the Maritza, which is navigable by small craft, connects it with Enos Bay. The Russians were encamped in 1829 some distance below the town, and there, of course, they suffered; but Adrianople itself is healthily situated, and has a good supply of water.

It is most important, that with the exception of hospitals established on the sea coast, all arrangements should be completed before the setting in of winter. The erection of wooden hospitals for temporary use would be both cheap and easy; the Turks understand the lighter sort of carpentering very well. Mats of reed are excellent coverings for the floor, and can be got anywhere; nor is there a scarcity of rough and strong carpeting. Mattrasses can be extemporized by means of dry *kukuruz* (Indian corn) leaves. There is an ample supply of material for whitewashing, which has, in Turkey, many advantages over the process of painting. A good supply of portable iron-bedsteads will be found indispensable. Every hospital ought to have one or two very light waggons, as the roads are unfit for heavy vehicles. There are, in nearly all the larger towns, German waggoners, who are capable of constructing and fitting up these light vans. They generally understand mattrassing also; but the supply of cow or horse hair is far too small, even for the usual home consumption; on the Wallachian side, on the contrary, there is no lack of that commodity. The bread is hardly fit for hospital use; nor are there any good bakers, except at Constantinople and Bucharest. A few bakers and one or two millers might be advantageously attached to the army. There is, likewise, a great scarcity of persons who understand the washing of linen; soap is horrible, and candles not much better; and, as I am on hospital necessaries, I may state that leeches are very cheap and good. Considering the density of the population, the narrow streets, and the want of arrangements for the removal of filth in Turkish towns, the selection of a site for an hospital becomes a matter of great importance. However, there are, in most of these towns, some large buildings which could be appropriated, and by means of whitewashing and other cleansing processes, rendered at once fit for use. Where it

is necessary to erect wooden hospitals, the outskirts of towns should be preferred.

Cleanliness can nowhere be depended on, if we except the Armenians, the better and middle classes of the Jews, and the Turks. Some caution ought to be exercised respecting the condition of the cattle bought in the country for meat. In Wallachia and Bessarabia the murrain is frequent among horned cattle; other diseases again occur among the cattle on the right side of the river. In those places, where cattle for the daily supply of the garrison are to be slaughtered on the spot, Jewish slaughterers would be a great acquisition, as they are more competent than others to judge the healthy condition of an ox, sheep, or goat. I likewise conceive, that the Jewish method of salting the meat after slaughtering is, on sanitary grounds, worth consideration. I am also sure I shall not be wrong in recommending the Turkish Jews for any purposes connected with the commissariat, or in mercantile dealings generally. Some honest and intelligent men of this race, however few, are sure to be found in every town. In fact, the scanty stock of conscience and honesty existing in Turkey, may be entirely divided between the Turks and such Jews; but as the former possess no energy, I consider the latter the only individuals who combine business tact with rectitude of principle—a quality of no small importance in a country, where selfishness and deceit are at their height, and the art of dissimulation carried to perfection. In no country has the stranger greater need of energy and decision than in Turkey. The Turk, with all his good parts, is the victim of his procrastination. Suppose a medical officer should require the smallest sanitary process to be carried on, he will never see the beginning of it, unless he looks after it himself; the invariable reply, "Bacalum!" will satisfy the Turk, and there the matter ends. To wait until a thing is *done* by him, one may wait long enough "Rusticus exspectat, dum defluat amnis." At all events, the medical officer will have the consolation that *no one* will interfere with any regulation, which he may be willing to carry out himself. But for this indolence, for some dogged prejudices which it will take half a century to break down, and occasional fits of the cruel disposition of the Osmanlis of yore, not to mention their crotchet, that every perfection of the "Giaour," whether English or French, has been created for the express use and advantage of the happy Mussulman, the Turks would be an amiable nation. I would record on this occasion the great kindness, shown me by his late Excellency Zaduc Effendi, whose physician I was, as well as by both his sons, Ibrahim Bey and Achmet Bey, the latter of whom, I am afraid, is the young hero of that name who fell last month, in an encounter with the enemy. Whoever may survive of that amiable and kind-hearted family, may rest assured that I shall ever retain the most grateful remembrance of the time which I spent under their father's roof.

Comparatively speaking, Wallachia possesses many more, though not less dirty towns than Turkey. The roads are in a better condition in summer than they are on the opposite side, but the snow in winter, and a regular quagmire in spring, greatly impedes the transit; however, the more general use of horses there, instead of bullocks as in Turkey, gives at all times a greater impulse to every kind of communication. Well arranged hospitals, of considerable size, are established in various parts, with every facility of organizing many more; and a more regular supply of medical, and the usual European, comforts can be depended upon. Although civilization may be, perhaps, one inch in advance of Turkey, yet the masses of the Wallachian population live in ignorance and

brutalizing dependence. The education of the Bojars and a few wealthy individuals, consists solely in a refinement of selfishness and ambiguity of character. To understand the latter, is to know more than the Wallachians themselves. Russian intrigue has impoverished the country, and undermined every principle. But an uncorrupted remnant breathes still the mountain air; and one day the Wallach may be himself again.

Although these few remarks, on Wallachian and Turkish nationality, do not entirely correspond with the main object of this paper, they may still be of some use to medical and other readers; moreover, I deemed it right to use my prerogative on an occasion which was not of my own choosing. The few short notes in my diary, which refer to my practice in the East, were never intended for publicity; and that period of my medical life has receded long ago into the back-ground of dim recollections before the pressure of daily duties.

In accepting, therefore, the request to dot down my experience in those provinces, far from consulting my own inclination, I followed solely what I conceived a call of duty; for, as I am probably the only English physician possessing personal knowledge of the country, I considered that this knowledge, however imperfect in itself, and however deficient my talent of conveying it, was public property, the moment it was asked for. The same consideration has entered into the plan of the whole. My remarks were made on one hand in reference to our army, composed of men in the prime of life; and hence everything applying to individuals of other age and sex, comprehending nearly three-fourths and the most instructive part of my practice, was carefully omitted, however great the temptation might have been to make use of it; on the other chiefly to medical men, who are perfectly conversant with every department of practice. I, therefore, have not referred to the usual methods of treatment, nor, with one exception, to the description of disease, but only to some salient points of difference between the diseases of the two countries, and to other matters, which may not be universally known. The difficulty of joining together these points and hints, varying in magnitude and importance, was greater than giving a detailed account would have been. It really became a question of arrangement and package.

Having said so much in vindication of this paper, my only duty now remains, to express my thanks to the Director-General, for the kind and courteous manner in which he received my remarks, and requested me to arrange them in this form; and, while in responding to that request, I have embraced the opportunity afforded me to do my part in promoting the well-being of our noble troops—a duty to which every high-minded citizen ought to be alive—I have performed my task under the conviction, that "*the race is not to the swift, nor the battle to the strong*," but that safety rests with *Him* alone, who will grant success to the righteousness of our cause.

7, *Suffolk Place, Pall Mall East,*
May 1854.

MEMOIR

ON SOME SPECIALITIES IN THE

REMITTENT FEVER

OF

THE LEVANT,

OBSERVED BY

CHARLES BRYCE, M.D.

SOCIO CORRISPONDENTE DELL' ACCADEMIA DE' LINCEI DI ROMA.—FELLOW FAC. PHYS. AND SURG. GLASG.—AUTHOR OF "ETIOLOGY OF FEVER," "STRICTURES ON VARIOUS OPINIONS ON THE REMOTE CAUSE OF CHOLERA," ETC., ETC.

IT IS NO SHAME NOT TO KNOW THAT WHICH ONE HAS NOT HAD AN OPPORTUNITY OF LEARNING; BUT IT IS DISGRACEFUL TO PROFESS KNOWLEDGE AND REMAIN IGNORANT.

MEMOIR

ON THE

REMITTENT FEVER OF THE LEVANT.

The writer has for object, in what follows, to state some specialities observed by him in respect of the sources, nature, and treatment of the remittent fevers which prevail in Turkey and on the shores of the Levant. The extent of time and country over which his observations were spread, and the similarity of the circumstances in which his experience was gained, may give to both, at this period, the only value which can justify their reproduction for the perusal of the Medical Staff of the expeditionary army serving in the East.

In the discharge of this duty, undertaken at the suggestion of the Director-General, Army Medical Department, his idea and aim have been to write up to and for military practitioners placed in a new scene, with minds well instructed by study of the admirable pathological museum at Chatham, and with a full knowledge of therapeutic agents at Fort Pitt Hospital. Even such may advantageously, perhaps, bestow an hour on the notes and reminiscences of a predecessor, who tried to comprehend the treatment of a formidable disease, unbiassed by the dogmas of the schools, or the doctrines of systematic writers. Their self-confidence may be guided, it certainly will not be weakened, by the cautionary precepts which it will be his privilege to inculcate.

The prefix remittent is sufficiently precise and comprehensive to designate the fever of Turkey, to which the following observations apply:—

All names, as mild, simple, bilious, inflammatory, malignant, are purely conventional, serving systematic writers rather to denote degrees of severity and alterations of certain features, than to distinguish constant specific varieties of marsh fevers. And first as regards the sources and conditions in which the fever originates and spreads.

Previous to the year 1828, the people of the country around Macris, a considerable town in Asia Minor, opposite Rhodes, were periodically visited by vernal ague of a mild character. But it happened in this year, that the fever acquired suddenly an alarming virulence and mortality, so as to give rise to the belief that the plague had come among them. I had, in the summer of the year named, sought repose and health in Rhodes, but, afflicted by the daily reports of the fatal character of the disease at Macris, and struck by the circumstance that no case of it had appeared in Rhodes, in spite of the free intercourse with the infected locality, and of the numbers of persons who had fled to the island for safety, I pushed across to the continent for other purposes than to view its Roman ruins, or read Greek inscriptions.

Macris is built at the foot of a semicircular range of hills near the sea, and looks down upon a large open plain, in which the hill streams discharge themselves and stagnate. There is in this way formed an extensive swamp down to the walls of the town, on which cattle are pastured in the dry

months. In its immediate vicinity stands the burying place, thickly grown over with the cypress. I found that all the Greek and Jew inhabitants who could flee had left, but the Mussulman apathetic, yet apprehensive, abided in and with his assuring "*kismit.*"

The disease had, indeed, acquired a fatal range and intensity. Still, its remittent type, in the majority of cases, clearly stamped its dissimilarity from the plague, which I had just left ravaging Cairo. On investigating the circumstances in which the unusual form of the endemic might be supposed to have its source, I ascertained that the Govenor of the district had ordered all dead camels, horses, dogs, and other offal, to be deposited in the marshy place described. Of course these were left uncovered by soil. The fact that the virulent form of the fever had first appeared among the people most contiguous to this locality, was decisively traced. It was also observed that the evening sea breeze passed over the swamp on its way to the interior. The probable coincidence of effect and cause was then instantaneously comprehended.

The high, almost revered estimation in which the Asiatic Turk holds the English Hakim Bashi, was effectually appealed to. He was beseeched to do, and ordered to be done, as he pleased, and the first use he made of the license was to effect the burning and burying of the animal remains; within a fortnight after this proceeding, and without any other appreciable physical agency, the fact of the control exercised over the occurrence and deadliness of the distemper, was demonstrated. My notes state that while the cases of fever occurring after the destruction of the animal matter assumed a milder form, the old ones became more amenable to treatment. The plague was subdued. It has never been my lot to witness and receive from Mussulmans a more pleasing recognition of the power of the physician to stay the hand of the destroyer.

I reproduce the incident of Macris at the outset of this memoir, not more for the significant finger with which it points to one element of febrile miasm, changing the type and aggravating the force of marsh fevers through an agency then undervalued, or not recognised by the majority of writers, than because the occurrence first led me to the close investigation of the subject in hand. Moreover, the experience then enables me to better appreciate now the admirable opportunities that the army medical officer in the East will possess, in order to study and expound the true etiology of its remittent fevers—a duty which still waits performance. Let the incident further serve at this time to furnish some slight materials for argument and illustration.

To unfold the ultimate causes why marsh miasm and other aëriform products of vegetable and animal decompositions, are essentially febrific, is beyond the scope of medical science. We state the fact of the existence of a pyrexial miasm, and content ourselves with the investigation of its mode of action. And we denominate these causes though their origin be unknown, and in logical strictness they must be considered simply effects of remoter agencies into the nature of which no analysis can penetrate. All that philosophy can do is to declare the relation subsisting between cause and effect, and this not as an object of nature, but as a form of thought so understood. I shall speak of specific types of fever as resulting uniformly and exclusively from divers distinct sorts of paludal emanations. In this sense intermittent and remittent fevers of various types ought not to be regarded as constituting only a single malady, though all are engendered from the same general source, differing

merely in degree of mortality. Each ought rather to be thought of as the offspring of a distinct specific poison; and this is true, I apprehend, even of varieties of continued typhoid fevers.

Now, keeping the case of Macris and this hypothesis in mind, the practical questions in relation to our immediate subject are these. (1.) Are the sources whence camp fevers spring of a different specific constitution from those giving rise to the various forms of ordinary intermittent fever? and (2) if so, whether it is useful, as respects military *hygiène*, to discriminate betwixt these sources. The immense difference in the respective fatality of the two forms of fever, and the relative influence of the one and the other over field operations, raise these questions above the sphere of mere speculative theses, and inspire their suggestion to those who have been intrusted with a safe solution.

The experience of army medical officers, being the result of observations on organised masses of men in very dissimilar places and conditions, ought to be the most valuable testimony that can be brought to bear on these questions. It is doubtless very discouraging to know the little progress hitherto made towards their satisfactory answer by this favoured class of observers. Nor are their *confrères* of the naval service more advanced. Indeed, no mental labour can be more irksome to the ingenuous mind than the attempt to reconcile the contradictory statements of fact and of phenomena vouched for by medical authorities in both services. The toil of Sisyphus and his reward.

Having, in 1832, placed before the profession my views on the etiology of fevers, I shall here merely repeat the following propositions then fully argued and attempted to be proved.

1st. That intermittents are generated by emanations of which the decomposed elements of *vegetable substances alone* constitute the predominant febrile miasm.

2nd. That simple remittents have their source in the emanations of decomposed *vegetable* and *animal* substances under certain auxiliary circumstances.

3rd. That malignant remittants, with a typhoid complication, originate from a miasm in which *human effluvia* are necessarily and largely combined with the compounded elements of decomposed animal and vegetable matters.

My reasoned conviction is, that these three forms of fever have as necessarily three distinct poisons for their primary production, as that they naturally possess three specific pathological types. I can, however, here only glance at some of the grounds on which this statement is founded.

Regarding the *first* of the propositions, it receives a pretty general assent of observers, and its accuracy, therefore, need not be enlarged upon. As respects the *second*, it seems established, also, that dead animal matter and *exuviæ*, in certain conditions, give out exhalations which contribute essentially to the morbific properties of those resulting from vegetable decomposition alone. Indeed, few observers have denied, however diversified their explanations of the fact, that vegetable and animal effluvia combined, are the most powerful agents in spreading the *materies morbi* in endemic fevers. The *third* proposition will have to be noticed at some length in the sequel.

In the mean time, let me invite the reader to go back with me to Macris, for an example of the manner in which I conceive these three miasmic states are successively produced, and manifest their activity. There we saw the indigenous intermittent converted into a remittent soon after, not to say consequential on the adventitious addition of the elements of putrescent flesh to the ordinary marsh miasm; and this re-

mittent again, not merely intensified in deadliness, but its specific character likewise altered after a time in the more crowded parts of the town, by the further addition to the pre-existing *malaria* of the morbid emanations from sick and dead bodies.

It is for others, placed in similar circumstances, to show wherein I erred in my search, and detection of the source and agency of the immediate causes to which I have imputed the aggravation of the ordinary fever of Macris. Because of my conviction of the justness of the inference and its importance, I dwell upon this transition of one form of endemic fever—simple, curable, and, humanly speaking, controllable in its deadliness—into another, wherein medical science, zeal, and skill, are of little force in contest with the individual case, but wherein the same professional attributes, supported by an enlightened appreciation of them on the part of the military authorities, can triumphantly struggle against and vanquish the insidious foe in its aggregate form and action. I hold it for a principle, and a fact, incontrovertible as important, that the most virulent fevers can be effectually restrained in violence and diffusion, by means which practical medicine has pointed out. These means are two-fold—one the removal or mitigation of the aggravating circumstances, as was done at Macris; the other and better, flight from the sphere of the malaria, shunning the places where the malignant fever is declared to exist. Military writings abound with instances, where the General has proved himself the true physician in seasons of dismay and pestilence, by the prompt removal of his encampment.

The records of our naval service, likewise, afford many similar illustrations. An instructive one of the kind happened on board the *Hellas*, flag-ship of Lord Cochrane, in the Greek Archipelago. In the summer of 1827, cruising off the Morea, we encountered weather sufficiently rough to cause the closing of the main deck ports for three days. A great deal of rain fell too. The capote formed the dreadnought by day, the blanket by night, of the native crew of six hundred. A few days after the clearing up of the weather, the temperature high with a calm, dropping cases of inflammatory remittent fever appeared among the men. Sagacity to detect on the instant the cause of this sudden outbreak was wanting by me; and it was not until eighty-three persons had been struck down in less than a week, that I seized upon the source of our visitation, and was taught a lesson which instructs me now. Bad smell from bilge water, and its daily increasing offensiveness, first directed inquiries to this possible source of evil, and, fortunate in a commander, whose rare philosophic spirit is only equalled by his naval achievements, I was enabled to institute a thorough overhauling of the lower regions of the ship. On the cable tier, immediately under the main hatchway, was found a layer some inches thick of biscuits, olives, fish-bones, pieces of salt and fresh meat, &c., the remains and refuse of the men's dishes cast into this receptacle. The active decomposition going on in this pestiferous hotbed engendered an atmosphere that, once inhaled, satisfied the most sceptical on board of its noxious character. The remedy applied was prompt and successful. Plugs were opened to let in a deluge of sea water, and which was immediately cleared out by powerful pumps. A few hours sufficed for this cleansing operation; simultaneously with which the men carried aloft and spread out their traps: decks and sides were washed down and scrubbed, hold fumigated, fires burnt, and hot shot placed below. His lordship was pleased to adopt my suggestion to have the sick, capable of removal, put on shore under canvas, and the consequence was that a fever

which had assumed an alarming aspect disappeared as by a charm: a result attributable, in my opinion, to one physical condition, namely, the removal of the pollution from the ship's people.

Still do not let self-complacency mislead us. It rarely happens that one can so easily establish the subsisting connection between cause and effect as in the instance just related. I must revert, therefore, to the point where I left off discussing the sufficiency of my second proposition, to remove some of the doubts and difficulties that beset critical inquiries into the natural conditions which precede and provoke remittent epidemics.

All experience has, indeed, shown that the salubrity of the atmosphere in certain situations differs from that of others—and an experiment may be taken to have proved that the soil is the source, and putrefaction of animal and vegetable substances the process, that produce this difference in the state of the air. To discover the ultimate cause why putridinous exhalations are essentially morbific will probably ever surpass our knowledge. Yet, although not cognizable by our senses, nor demonstrable by chemical analysis, we speak of this atmospheric state as of a *material*, since on its presence or absence depend the occurrence or non-occurrence of fever.

Here, consequently, as in some other etiological investigations, we must content ourselves with the statement of the mode of operation of marsh exhalations, and call this a cause; though, in logical strictness, it must be understood simply as an effect of a more remote agency. Such a cause, consequently, can be known and examined only through its effects, and these effects I have named and enumerated. In other words, we only know endemic influences by their properties and effects in relation to resulting agencies.

Perhaps we are now better able to discuss the questions formerly asked, namely, are the sources whence camp fever spring of a different specific constitution from those giving rise to the varied forms of ordinary ague? And if so, whether it is useful, as respects military *hygiène*, to distinguish betwixt the agency of these sources?

But here interposes the difficulty, whence then the etiological distinction in the two sources of simple agues and complicated remittents? We know the former prevail in spring, a season most favourable to vegetable miasm; while in autumn, besides this exhalation, there are given out copiously miasmic constituents in the destruction of myriads of insects, reptiles, birds, and quadrupeds, whose term of existence closes with the summer. Disorganized animal matter abounds usually in localities where putrescent vegetation is exposed to the corrupting influences of heat and moisture, so that in autumn there is no swamp the air in contact with which is un-impregnated with these mixed emanations. It is to this natural law we must ascribe the great and permanent mortality in particular circumstances—for instance, the slimy margins of river lands subject to tidal influence, marshes occasionally inundated by sea irruptions, whence the invariable occurrence of, and frightful insalubrity from, remittents of the marshy tracts along the Mediterranean shores, especially in the Papal and Tuscan territories. For this reason, too, intermittents are never found among the *pyrexiæ* that follow the ravages of war and of earthquakes. They are unknown around Ephesus.

Let me now assume the truth of the facts and inferences just stated in order to value their bearing on military *hygiène*. If the fact of local pollution, as one great source of fever, were recognised, and the importance of its destruction, or its escape from, inculcated authoritatively, it cannot be

doubted but that nine-tenths of the life-and-money-cost of war would be saved a nation. Any apprehension on my mind regarding the progress and issue of the actual campaign in the Dacian provinces is not caused by the potency of the enemy's fire-arms, but from my knowledge of the military indifference to medical counsel which has been too often shown. Even when this disposition may not be lacking, strategic necessity may compel a disregard of sanitary measures whose utility is acknowledged. It is reckoned—*absit omen*—that Russia lost sixty or seventy thousand men by disease alone in her progress from the Pruth to Adrianople in 1828 and 1829. How grand then the mission of the medical man on foreign service. It is his privilege to teach that, though man may not moderate the violence of the deadly harmattan, he can turn himself aside from the pathway of its deadly blast—that though science cannot annihilate the elements that form nitric acid, yet it may modify their commixture to the proportions of common air: that the atmosphere of the *grotto del cane* is destructive to the quadruped, it is innocuous to the erect man. The medical records of both services furnish a thousand observations to justify the physician in asserting that the sphere of a malignant form of remittent fever may very probably be confined to a tainted district, even if the presence of the diseased contribute in some measure to its extension; in other words the general officer may fix boundaries to its range. In fine, modern science furnishes many striking facts for the unobtrusive intelligible teachings and warnings of the soldier in every day discourse on the part of the medical officer, and my belief is that he will encounter fewer difficulties in the applications of his doctrines than his predecessors did; and this, not more because of his own superior philosophical acquirements, than because of the recent large and sound teachings of the public press in respect of the health of towns bill and the like.

Bearing in mind the aim and opportunity of this memoir, I am constrained to indicate opinions, contented if they provoke controversy, rather than state the accumulated evidence of their complete truth. For this reason, in what has gone before, I have done little more than cast doubt over one well received doctrine of the schools, namely, that both intermittent and remittent fevers arise alike from the common agency of a febrile miasm; the product of vegetable and animal decomposition only varying in its effects by degrees of concentration or other accidental modifications. Hence also, in passing on to a second point of etiological interest, I shall almost content myself with showing reason for denying another authoritative doctrine, namely, that the remote cause of camp fevers can be reduced to the operation of one and the same miasm, or febrile principle, in all cases; sometimes issuing from the effluvia of the living body, and sometimes from those of dead organized matter. In the first place, I am of opinion that human effluvia from healthy bodies, however numerous and congregated these are, if received into a pure air, are perfectly innocuous. Take the case of slave ships. In this traffic, hundreds of beings packed to a degree that suffocation has thinned their numbers, and not only their victims but their captors have escaped sickness under circumstances of all others the most prolific of living animal effluvia. Nor do I acquiesce in the commonly received teaching that these effluvia can by any self-change of simple concentration and stagnation acquire the property of generating fevers of a specific character. It is very certain that ample proofs might be adduced to show that there frequently co-existed all the conditions of crowded ill-ventilated ships, of densely peopled cantonments, be-

sieged garrisons, inattention to individual and aggregate cleanliness during considerable periods of hot wet weather without any manifestation of febrile disease. It may be supposed things are different in Turkish men-of-war now, than when I was in the Levant. I remember, on the capture of one of their frigates, that, on attempting to go below, I was seized with nausea and vertigo. The ship stank throughout as a charnel house. Yet there was not a case of fever on board, nor did one occur subsequently, though the wounded were many.

The observation of such like facts in the Levant convinced me of the impotency of human effluvia alone to generate febrile disorders, and the common explanation for such immunities from disease, namely, that the system of those exposed had become so inured to the febrile miasm as to be no longer susceptible to its impression, was, in the case stated, quite inapplicable, inasmuch as great numbers of the prisoners were received on board the captor—the prize was manned by a like number of Greeks, and in neither case did disease show itself. In fact, so strong is this negative testimony, that many medical writers affirm the total independence of even continued fevers of atmospheric influences, referring their sources of production and force of propagation to the specific infection of deceased bodies. This last conclusion appears to me also erroneous, for if causation be ever an admitted element of nosological classification, it is surely most important to recognize a specific distinction betwixt intermittents and remittents, as they are observed in the situations and under the conditions of their most ordinary prevalence. Of course, no one would deny that all fevers are made worse by the presence of the sick in crowded places, but then comes the question, wherefore and to what extent the aggregation of diseased bodies, *exclusive of infection*, not only augments the productiveness of the paludal miasm, but likewise alters specifically the productiveness of the fever thence engendered? Strange that it should be still reserved for medical observation and philosophy to solve the problem, whether the *malaria* arising from the earth's surface, and producing only intermittent and remittent fevers, may, or may not, in certain circumstances and at certain times, excite fevers which take the continued form, and thereafter propagate their kind, as small-pox and measles do; and yet this problem of the *convertibility*, under given circumstances, of a decidedly non-contagious fever into one infectious—using the term conventionally in its restricted sense, as implying either contact or proximity—involves an inquiry of surpassing importance for the army medical officer. The question in its simplest form is this: Can one specific pyrexial disease have two modes of origin?

For its better elucidation, let me have recourse to a peculiarly appropriate example of this assumed rule of camp fever:—a marshy plain outside the fortress of Silistria, the scene of many fierce encounters in 1828, became covered and charged with carnage. Its surface ceased to produce its ordinary mild remittent fevers; but instead, one of a malignant character appeared, wherein an apyrexial interval was scarcely distinguishable. At a late, though proximate, period it was observed the hospital tents and sick hovels furnished a vast proportion of the deaths. The fever speedily acquired a more continued form; and, more fatal still, hospital attendants of all grades were scared from their duties—a panic, with its thousand-handed gripe, seized upon the troops: the presence of a veritable pestilence was proclaimed.

It was everywhere believed that a deadly poison was eliminated from diseased bodies, polluting the clothes, tainting the breaths, infecting the persons of all whom chance or need brought into contact with them. This is a faithful outline of what once befell a Russian force on the very ground which British troops may occupy in parallel circumstances. Fever there will be, and many deaths the consequence. For the northern host there was no salvation in medical resources, nor was their absence grievously felt by the country. But with the western allies the science of the physician will be appealed to, and not in vain, to declare of the disease the true nature, source, and laws of increase,—to enforce efficient prophylactic measures against its insidious inroads, and to uphold the integrity of a belligerent force.

In accepting this perilous trust, will the army medical staff best sustain its responsibilities by denying or affirming the natural aptitude for one or a thousand, sick of ague, becoming the focus of typhus with its inherent attribute of infection? in other words, ought they to pronounce for the doctrine of so called *contingent contagion*, and solve the problem stated in the affirmative?

If this be the decision arrived at, I dare not say beforehand it will be an erroneous one; and yet it is incumbent on me to point out some difficulties in its way.

The term *contingent* contagion is one of modern medical phraseology, which, like many of its class, substitutes vagueness of speech for precision of thought. It is used to specify a disease that, arising from indigenous sources of organic putrescency, can, in its action on the living system, so affect certain secretions as to render them infectious. The operation of the primary morbific agency is, it is said, superseded by infection; that is, the malady that originated from general or local atmospheric pollution becomes propagated by contagion.

But the question is, has the body labouring under marsh fever the faculty of generating, by secretion, poison of the same morbific agency as the terrestrial pollution which it is supposed excited the primary disease? The supporters of this doctrine uphold the affirmative; and in doing so, assume a principle repugnant to all laws of etiological reasoning. They affirm that the same malady can be produced by two causes essentially different in their nature; in other words, that like effects may follow from dissimilar causes. The morbific qualities of emanations from *dead* organic matter are here identified with those of a specific infection from *living* bodies. But surely it is unphilosophical to say that a disease, originally excited by a combination of causes, of which contagion forms no part, can generate an infectious virus.

Emanations from putrid organic substances, and secretions from living bodies under disease, must possess, each, peculiar morbific properties. These properties should be distinguished therefore, according to their distinct sources; and their effects, in corresponding to these sources, must be dissimilar. They who assert that contagion is the first essential of cholera, hold a doctrine which is consistent with itself; but they who admit that noxious exhalations originally produce this disease, and at the same time contend that it is subsequently propagated by specific contagion, violate an established rule of philosophy; they have recourse to more causes than are sufficient to explain the phenomena. They unphilosophically maintain, apparently without perceiving the absurdity, that two poisons, essentially different in their nature, are capable of producing the same disease. I shall not further discuss the philosophical objection, though, to my mind, it is of itself completely conclusive against the hypothesis, that two altogether dissimilar effects can proceed

from one and the same cause. The rule, that similar causes produce similar effects, is, in my opinion, as absolutely true in respect of pathological conditions as of any other physical sequence.

I shall here only repeat my conviction, founded on some personal and much literary investigation of the subject, that vernal intermittent and autumnal remittent fevers, mild or malignant, of undoubted atmospheric origin, do not gradually acquire the property of being transmitted from body to body, or give rise to an agent capable of doing so.

But if it be asked, do I dispute the fact that fevers of an infectious nature have devastated camps? my reply is,—certainly not; my explanation of the fact is this—I believe, in the first place, that the infecting element must be imported into the locality by patients or persons who have been in recent close proximity with them; and, secondly, that where thus imported, it cannot propagate itself except through the *medium* of an atmosphere charged with miasmic emanations. I contend for the existence of a two-fold agency, or rather, for the conjoint activity of two agencies: that fever becomes infectious from the presence of a foreign element, that this foreign poison cannot be extended through a pure air, but only through air made impure by putrescent organic exhalations. My hypothesis thus involves two conditions; one, that in every instance of a true infectious fever, a morbific matter is transmitted from a body labouring under its influence, or from substances impregnated with the pollution; the other, that the specific operation of this matter can be exerted only in an impure atmosphere: the effluvia thrown out by infected bodies furnish, it is true, seeds for fresh disease, but unless these find a proper soil for their reception, they do not germinate. The idea now advanced admits of easy comprehension and proof. I have not had an opportunity to test its reasonableness on a large scale of camp fevers, but I have done so in respect of cholera during the epidemic of 1832, when I personally inspected, or was informed officially of the local conditions of several hundred cases.

Let me, in conclusion, beg that no reader will think I am unduly urgent on a right determination of the important question just mooted. That I am earnest, is because of a painful remembrance of a time and an emergency when I felt my own incompetence to advise. And let every military officer in Turkey reason himself to a conclusion on this subject, for he must anticipate the occasion when his decision must influence the health of a camp, and may compromise an army.

I proceed to the second head of these observations.

The remittent fever of the Levant appeared to me to present a very unmistakeable character and course. It has some features which distinguish it from the same named disease of the East and West Indies, not necessary to note here, for where seen they will be at once recognised. The assemblage of symptoms that bestows its specific name, marks also its pathognomic nature. The most prominent of these symptoms are, after a longer or shorter period of langour, restlessness, and sense of chill, intense headache, great nausea, vomiting, purging of blackish very fetid stools, urine scanty and dark, skin parched or soaked with fetid sweat, pulse small, quick, irregular, extreme prostration, pyrexical remissions and exacerbations hurried and obscure. It is seen these pathognomic signs group themselves round two great centres of living action—the sensorial and chylopoëtic systems. The only difference I noted in the fevers of Greece,

Egypt, Asia Minor, and Turkey, during three years of observation, seemed to depend rather on the habits and ages of those affected than on any essential pathological condition. I think there was less of serious gastric complication with the Turks, and more cerebral disturbance. Among other natives, Greek and Armenian, perhaps the opposite of these predispositions existed. It is more important to add, that I have seen the pyrexia sometimes partake of a typhoid cast, at others of an inflammatory from the first seizure. I have likewise seen the fever commence, and run a course of ten or twelve days, with little trouble to the physician, and, in the same locality and period, other cases that in the beginning resembled our home-bred continued fevers, and were of fatal issue, unless at an early stage a well marked remission took place, in which event the patient was usually saved.

While I believe in the existence of idiopathic fever that is not *caused* by local inflammation, and that the latter, when it does take place, is only an accompaniment or contingency, and not at all the essence of the disease, yet I must be allowed to say, that in my opinion the true nature—the proximate cause—of remittent fever is not properly appreciated, till the medical observer has long and closely studied the proofs which it furnishes of the presence of acute congestion of the mucous digestive surface at the very earliest stage of the attack in the vast majority of cases. It has been my lot to see the sudden aggravation of the disease in its middle period from improper diet or drugs, and a severe relapse from a like cause even during convalescence. When death resulted, I have detected previously unequivocal signs of the gangrenous destruction of the lining membrane of the stomach. In my day autopsy was forbidden, even in the medical schools of Constantinople, but I had afforded to me by Clot Bey, chéf of the Egyptian medical staff, many opportunities of discussing with him, scalpel in hand, the then (1828) recently published doctrine of *gastro-énterite;* and of convincing myself that till then my knowledge of the pathology of remittent fever was very dangerous. I am of opinion that Broussais and his disciples err in the exclusiveness of their pathology, the inertness of their therapeutics, but I also fear that the epithets bilious and bilious inflammatory, as frequently met with in English medical nomenclature, may lead to erroneous views of the nature and treatment of remittent fevers of Turkey. The liver unquestionably participates in and aggravates the general chylopoëtic disturbance, but this not more certainly than the kidneys, if the organic lesion of both viscera be judged of by their respective secretions during the continuance of the fever.

In this imperfect estimate and interpretation of the pathology of the remittent fever seen by me in the East, I only produce thoughts noted at the time for my own guidance; it is, consequently, my duty to avoid the air of positiveness. I know, too well, that the principles of all pathological diagnosis, in the true sense of this term, must be tested by experience. Hence, I seek to provoke discussion on the abnormal condition of the intestinal canal in remittent fever, by ranking it rather as a cause than a consequence of diseased action:—*lis adhuc sub judice est*—but even in practical medicine we are bound to allow that many propositions belong to the category of the disputable. And surely it is better that the mind be kept excited, even its doubts unresolved by antagonising propositions, than be stupefied by slavish empiricism through the bad habit of looking at the routine practice of medicine as our only safe guide. Our knowledge of the fact, that bark cures ague, is no excuse for indifference respecting the nature of the disease and the

mode of action of the remedy. And, for my part, I know of no disease where experience gives less license to carelessness of diagnosis at its first outbreak, as, indeed, also, where watching and inquiry are more necessary throughout its course, both individually and as an endemic.

I have at length arrived at the purpose and reward of this earnest endeavour to lessen one peril of the soldier's life in Turkey, by connecting, namely, the physical conditions and pathology of its remittent fevers with rational and successful modes of treatment.

Nevertheless, for me to attempt to specify the curative means applicable to the endemic, under all circumstances, would be impertinent and delusive. All I can venture upon is to indicate a few specialities observed and noted by myself, and to offer one or two conjectures regarding the practice which British medical officers will probably find most conducive for the recovery of the Europeans under their charge. Indeed, as one tome is needed to embrace the territorial conditions, various forms, modified symptoms, and frequent complications of this single group of fevers, so a second, would scarcely suffice to contain the multitudinous medical precepts and prescriptions for their treatment.

The nature of the disease in hand, such as it has been just described, as well as weight of authority, direct the practitioner's mind to certain ruling principles of action. He will strive, doubtless, to prevent, moderate, and remove active congestion in particular viscera; to maintain the vital powers, and impart energy to the vascular system; to preserve, or rather restore, when in abeyance, the apyrexial intervals. Means to fulfil these indications are crowded on his choice. And in the selection of the fittest for the first and main purpose, I predict the *modus operandi* of the English and French regimental surgeon will be found to differ in important particulars; but in no respect will it be contrasted more than in the employment of the lancet at the beginning of the attack, and the exhibition of mercurials and active purgatives in its early stages. The latter will proceed, I know, with a proper respect for the doctrine of *gastro-énterite* and its prescriptions: the former, I fear, will regard the bilious inflammatory character—acute congestion of the liver—in too prominent a light, and bleed according to the state of the pulse. Now, general bleeding, and ten grain doses of calomel, and scruple doses of jalap, repeated again and again at intervals of a few hours, will not, I venture to say, prove so advantageous to British troops as to their antagonists. It certainly appeared to me, in the few instances where they were used, that general bleeding, mercurials and purgatives were more consonant to English therapeutic routine than consistent with the obvious pathology of the disease, or conducive to recovery. Whilst, therefore, I do not localize the seat and essence of ordinary remittent fever, exclusively in vascular congestion of the liver and mucous membrane of the stomach and bowels, I am of decided opinion that English practitioners cannot in its treatment safely disregard the facts and reasoning on which the Broussaian doctrines are founded. On the other hand, the Clutterbuck pathology, which generalises the proximate cause of marsh fever into primary disturbance, and subsequent lesion of the cerebro-spinal system, cannot be reconciled to its Eastern phenomena.

My notes of cases, it is true, show that I had need to be always on the alert to combat and subdue, as of chief importance, a morbid state, which I find variously called sensorial excitement, cerebral irritation, nervous excitability—next in order of importance, gastric irritation, and simul-

taneously, or immediately consecutive, great general debility —states altogether prohibitive of bleeding. Indeed, it may be said, generally natives and old foreign residents in Greece and Turkey did not require venesection; and the English travellers and seamen whom I have attended for the fever have had their systems too much reduced by fatigue or intemperate habits to admit any general depletion. In the fever at Macris, it assumed the malignant asthenic form in a great number of cases.

There was no one particular organic affection attendant upon, or characteristic of, this endemic, but in its duration different organs in different individuals became affected. In some the cerebral functions were chiefly disturbed, in others the liver and intestinal mucous membrane and their secretions greatly vitiated. Nevertheless, without being deceived by their seeming congestive or adynamic symptoms, with which the febrile attack was ushered in and attended in different cases, I had recourse to quinine, in full doses, at a very early period of its progress. (Be it noted, the drug had first to be procured by special courier from Smyrna.) My adjuvants were opium, infusion of *lauro-cerasus*, leeches, sinapisms, aperients very sparingly: the result was satisfactory.

Of one case, *me miserum*, I can speak feelingly, if not reason rightly. Having reached Ephesus from Macris, on an afternoon, July 1828, I rashly went down the same day to the saline marsh, in which all that remains of its ancient greatness lie or stand immersed. Before morning I knew I was in the gripe of the pestilence that walketh in darkness. A faithful English servant was my physician, nurse, and friend. I had sense now and then to tell him when and where to apply leeches and spongings, and fruits were my chief sustenance and physic for ten days, when I could be borne through Magnesia to Smyrna to procure quinine, of which a few doses exercised its mysterious influence over the febrile paroxysms. My convalescence was, however, unusually protracted, probably caused by the too free use of leeches and extreme abstinence. And, speaking of my own case, egotism may be further borne, if I add that my experience of three years, and a close observation of other European travellers and residents throughout the Levant, convinced me for all time, that what in the West is held as moderate indulgence at table is hazardous there, and that an intemperate habit is sure death in the event of a febrile seizure. It is, moreover, my opinion that animal food may not be safely eaten as often and largely as Englishmen in particular hold themselves entitled to do. There is sense as well as triteness in the adage, to do at Rome as Romans do—and the precept is still more applicable to Turkey and its people.

My observations, as my experience, have been directed hitherto to those forms of paludal fevers, which are seen ordinarily in the Levant, afflicting equally strangers and natives, and which ought not to present any very formidable difficulty in respect to their treatment. The medical attendants, deplorably inefficient in numbers and ability, of the Greek and Russian armies in the Morea and Bulgaria, respectively (*tempore* 1827-28-29) encountered, as I have shown elsewhere, an outbreak of asthenic remittent, the mortality of which was truly frightful.

This is that type of camp fever which attacks troops fatigued by marches, and dispirited by defeat, against which even English soldiers have not always been proof—witness the campaign of Holland—with difficulty contesting every foot of ground amid carnage; the soil, wet—weather hot—rations scarce and irregularly served. I have been

told by surgeons engaged in both services, that in the treatment of those fevers, their only success was from the early and large use of quinine as soon as the stomach was brought to bear it, and for this purpose, opium, and other sedatives, were had recourse to, both prior to, and during its administration. For myself, when at Macris, I had to deal with a disease very closely resembling, if not identical with, that under consideration: a dry, dark loaded tongue did not deter me from prescribing quinine in a solid form. And I am very sure that hydrocyanic acid is not only compatible with, but highly auxiliary to, its employment. I gave no active purgatives by the mouth, even when the bowels were constipated; no diuretics, though the secretion of urine was sometimes very scanty. I had to choose between the possible mischief from congestion, and other abnormal action of one or more organs, and the positive evil of an interference which must postpone—and hours are life—the specific efficacy of a remedy that appears to me more than any other, to act upon the *materies morbi* of the whole frame. In a word, impressed with the truth of the etiological principles explained, and identifying pathological states with these, I reasoned that as quinine possesses a sovereign febrifuge quality in regard to one form of paludal fever, so it ought and will, in respect to all having the same source. And, consequently, my fixed idea and aim were to study and contrive means to hasten the moment for its tolerance by the stomach. My first combination to this end was its solution in an infusion of *lauro-cerasus*, and this did me good service. Afterwards, I was enabled to prescribe hydrocyanic acid, of a known strength, with more convenience, and equal efficacy. Camphor, opium, aromatics, were also duly combined for adjuvants. In addition to which, the skin received especial attention by frequent ablution, and orders to keep the body as naked as possible during the febrile exacerbations. I have it noted that the opposition on the part of Mussulmans to this last particular, appear to lessen their chances of recovery.

These are notes and reminiscences I have some pleasure in going back to. Their present reproduction cannot supersede the necessity for much thought on the part of any one who may read them, though they may help its application.

With this last sentiment I might well conclude this summary of treatment, defective though it is in precision and development. The few details subjoined may, however, be excused if they serve as practical hints for troubled moments.

Bleeding.—Vascular depletion appeared to me only safe when practised to control acute congestion appearing in the progress of the fever. It required some watchfulness and a little sagacity to detect this tendency to local determinations, but much forbearance to wait for and anticipate their occurrence. I think I have seen the premature use of the lancet convert a remittent into a continued fever, wherein the early necessity for stimulants was produced, and by which the season for quinine was indefinitely and dangerously postponed. Nothing can, in my opinion, authorise profuse bleeding in fever, unless there be an equivocal inflammation of an organ revealed by the common characters that proclaim inflammation under other circumstances. My practice was to bleed for visceral congestion, as is done in other hyperäemic states of internal organs, and then, in nine cases out of ten, I found leeches most conducive to this end (thousands can be had for the cost of gathering in many parts of the Levant). I can vouch for the fact, that Greeks neither require nor bear the use of the lancet in this fever. An old medical friend

and sound bedside practitioner at Constantinople used to say, that for every ounce of blood taken from the arm at the commencement of it, an additional drachm of quinine had to be given towards the close.

Sedatives are a most valuable class of auxiliaries, and perhaps no one more so than hydrocyanic acid. In every form of gastric irritation, with or without pain, alone, and in varied combinations, its good will be acknowledged. Camphor and henbane, opium and ipecacuhana will be also advantageously thought of in head complications. To procure sleep is of great utility; opium alone for the purpose is objectionable. In this class I likewise include, and esteem highly, frequent cold or tepid spongings.

Cathartics.—My objections to the employment of active and frequent purgation have been sufficiently expressed, and I return to the point only to guard myself against being misunderstood. I fully recognise the fact, that excreted mucus when accumulated constitutes a local irritant, and that it may be retained from debility of the muscular fibre, and act injuriously upon the cerebral system. So reasoning, I had resort to occasional aperients during the latter stages of the disease, to preserve the proper functions of the mucous membrane. Calomel in one or two grain doses, the blue pill, or hydrargyrus cum cretâ, fulfilled this indication sufficiently well.

Emetics.—It increased my hope of recovery to see a patient sufficiently early for prescribing ipecacuanha; but this remedy could not be used with Turks, from their abhorrence of vomiting. Given in the precursory stage, they sometimes appeared to destroy the attack, and at all times to abate its violence and duration. The practice, I believe sound, albeit empirical.

Quinine has been highly extolled in the preceding pages, but not more so than its virtues merit. In prescribing it my practice was to conjoin it with one or more drugs intended to subdue incidental or concomitant symptoms adverse to its use, as, hydrocyanic acid, camphor, henbane, opium. This mode of proceeding wins opportunities for its earlier use; it also enables one to persist in its administration, in spite of nausea, vomiting, purging. Full doses produced a slight, if any, general stimulating effect, and most rarely cerebral excitability. On the contrary, they were followed by a powerful and lasting sedative impression. Of course it is very important that the drug should be taken either before local irritation or congestion, hepatic or intestinal, has taken place; but when this may not be, then I qualified my prescription as above stated. I did not regard mere nervous excitement a bar to its use. Indeed, I came to doubt its generally supposed physiological excitant effects, and my conclusion was, that where quinine disappoints our expectations, the miscarriage is to be ascribed rather to some error in using it, than to the failure of specific virtue in the drug itself.

A single paragraph suffices for stimulants and counter-irritants, inasmuch as their use must be left entirely to the discretion of the practitioner. For myself, I gave the one very sparingly, the other I applied freely.

To conclude, the army surgeon and physician have at their command many grand resources which the civil practitioner does not possess—they seize the disease at its commencement. During its course they can assure themselves of obedience and all that relates to diet, medicine, cleanliness, and other external conduct of the case. Cost does not enter into their calculations. Consultations with colleagues, the co-operation of an organised system of admirable structure, are all auxiliaries to success. Knowing something of these

advantages, of the unbounded liberality with which all needful supplies have been furnished for the Turkish expedition, and of the spirit that actuates the chief of the medical department of the army, I am bold to predict that our military history will not have to record, and the country deplore, a second Walcheren.

Ludlow, May 1854.

EXTRACTS SHOWING

THE

PROPHYLACTIC INFLUENCE OF QUININE.

BY

ALEXANDER BRYSON, M.D., R.N.

TWENTY men and one officer were employed on shore for one day at Sierra Leone; to the former, bark mixed with wine was given; but the latter refused to take it. He was the only person of the whole party who was subsequently attacked with fever.* Again, two boats' crews were detached from the *Hydra*, to examine the river Sherbro. They remained away a fortnight, and, during the whole time, took bark and wine, as directed by the instructions; yet, though the locality is a most dangerous one, not one case of fever followed; but another boats' crew, who were absent for two days only, in the same locality, and at the same time, who did not take bark, were all attacked, except the officer in command of the boats.

Dr. Bryson suggested that "quinine being less nauseous than bark, and therefore less likely to be refused by seamen, should be used as a prophylactic instead of the latter, and that its use should be continued, not only while the men were exposed in unhealthy localities, but *for at least fourteen days after they returned on board,* in order that the antagonistic influence of the medicine might be kept up until the incubative period of the disease had expired."† The suggestion was adopted, and the results, upon the whole, are most satisfactory.

* Report on African Station, p. 49.
† Report on African Station, p. 219.

A strong, spirituous solution of amorphous quinine was mixed with several pipes of wine, in the proportion of four grains of the salt to an ounce of the wine; a number of cases, or boxes, was then made, capable of holding a certain number of bottles; these, on being filled with the medicated wine, one or two boxes, according to the size of the vessel, were supplied to each cruiser employed on the African station. The object in supplying the cruisers with medicated wine-chests was, that they might at all times be ready and at hand to put into boats suddenly required to proceed on detached service. Thus the quinine—which, when carried in paper, or bottles, was not only apt to be lost or blown away, but had to be given in uncertain doses, and therefore could not be husbanded—was secured, and the wine was effectually destroyed for any other purpose. Instructions for the administration of the wine according to the above plan were placed in each box, and the medical officers were requested to note and report on its effects. The following extracts will show the estimation in which it is held by the medical officers on the African station:—

"I found bark and rum given to the men going away on duty of the greatest benefit; but, from the bulk of the bark, and the small quantity of the rum, if the men were not watched closely, they would not take the draught at all. All that could be desired is now obtained in the medicated wine."*

"Eighteen men were detached in the pinnace and whaler to cruise off Banda Point and Mayamba Bay, in the months of February and March. They were absent for twenty-four days. I directed an ounce of quinine wine to be given daily to each person, and it is satisfactory to state that no sickness whatever occurred."†

"Two boats' crews have been constantly on detached service, close in shore, where the effluvium, wafted from the

* Dr. J. Walsh. † Thomas Pickthorn, Esq., Assistant-Surgeon.

land by the morning breeze, is very offensive, and highly pregnant with the odour of decomposing vegetable matter. The immunity from disease of those engaged in this service, I attribute chiefly to the regular use of quinine wine and bark, together with protection by good awnings."*

"The boats remained in the Pongas one night, and the crews — officers and men amounting to twenty-four in number—were exposed to the sun the greater part of two days. Quinine wine was given in ounce doses for eight days afterwards, and I attribute the exemption of the greater part of the people from fever to its use."†

It may be stated, that these extracts afford no proof of the preventive influence either of bark or quinine beyond the opinion expressed by the several reporters; but when taken in connection with those which follow, they appear in a different light, and form a kind of presumptive evidence which cannot well be rejected.

"During the time the boats were up the Scarcies, I gave an ounce of the solution of quinine to each man daily, and continued it for ten days afterwards; and, although the rains were commencing, and the men were often wetted through, I had not a case of illness."

"The boats were frequently away cruising in the mouths of rivers, or else blockading the coast between Delagoa Bay and Mozambique. I had frequent opportunities of observing the prophylactic effect of the quinine wine. In only one instance did fever follow its use, and that was of a mild character. This contrasts strongly with the seizure of a whole boat's crew with fever in March 1851, when no wine was administered, as it was lost in crossing the bar of the river. The men greatly prefer it to the bark."‡

"The gig was detached in the Boom-kittam; quinine wine, in the usual dose, was given night and morning, and continued for fourteen days after its return. A boy (Wm. Roberts), from dislike to the quinine, took at most but

* William Webber, Esq.
† J. A. Corbett, Esq.
‡ Mr. Beaumont.

three doses. He was the only one of the boat's crew that suffered from fever, which occurred ten days after leaving the river."*

"While coaling at Sierra Leone, the weather was very wet, and on their several duties both men and officers were unavoidably much exposed to the rain. An extra allowance of grog and quinine was given to each man, and continued afterwards for a day or two to such as seemed to require it. Mr. ——, however, placed no faith in its preventive influence, and would not take it, and he alone suffered an attack of fever, which proved fatal."†

"A boat's crew, belonging to the *Pluto*, were employed for twenty-five days up the Congo. The wine was regularly supplied, but it caused one of the men to vomit, and therefore he discontinued its use; he was the first to suffer from fever. Only one other case occurred among the crew.

"During our stay in the river Lagos quinine wine was regularly offered to the men morning and evening,—all took it, I believe, except two midshipmen and two seamen belonging to the galley. These four persons subsequently each suffered a severe attack of fever."‡ While, in the whole force, consisting of upwards of 220 men, there occurred only a few other cases of trifling importance.§

"When in the river Lagos the men had more than an ounce of quinine wine morning and evening, and not a case of fever occurred, though the vessel was nine days in the river.‖

"Thirty-six men belonging to the *Water Witch* were employed at the attack on Lagos; they were in the river four or five days, and, with the exception of three, all took quinine wine while there, and for fourteen days after they left it. Of the whole number, five only were attacked with fever, namely, the three men who did not take the wine, and other two, who most imprudently exposed themselves to the sun, and bathed while much heated by violent exercise."¶

* Return from *Teazer*, March 1853.
† A. Sibbald, Esq.
‡ Mr. Heath, Surgeon.
§ Mr. Carpenter.
‖ Journal of the *Teazer*.
¶ J. Henderson, Esq., M.D.

"On the morning of the 25th of November, seventy-seven men from this ship went up the river Lagos, to attack the town. Before starting, every officer and man was ordered to take a glass of quinine wine; and a sufficient quantity was put into the boats to repeat the same at night. All, to the best of my knowledge, took it, with the exception of Mr. D., master's assistant, who rather plumed himself on having escaped *taking a dose of physic.* This young gentleman, on the 10th of December, just a fortnight after, was seized with a violent attack of remittent fever: and of the whole number who entered the river, he is the only one who, up to this date (the 7th of Jan.), has been attacked."*

* F. Stupart, Esq. Surgeon.

EXTRACT

FROM THE MEDICAL AND SURGICAL REPORT

OF

MR. DRUMMOND,

Deputy Inspector of Melville Hospital, Chatham, between 1st January and 31st March, 1854.

"I have also to notice that in two cases of most intractable quotidian ague, which had for several months resisted every mode of treatment; I had at last recourse to the use of strychnine, and had the satisfaction to witness both my patients freed from ague in ten days from the commencement of the new remedy.

"The dose was the one-twelfth of a grain, increased to an one-eighth three or four times a day. Both patients have been well for two and three months, and continue so."

ILLUSTRATIONS

OF THE

PATHOLOGY OF CANCER.

BY

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ILLUSTRATIONS

OF THE

PATHOLOGY OF CANCER.

PART I.

GENERAL CHARACTERS AND CLASSIFICATION OF CANCEROUS TUMOURS.

CANCER, or carcinoma, is a name of extreme antiquity, derived, in the first instance, from fanciful similes.* MALIGNANT is a term of comparatively modern origin. Of the two, the former is preferable. For while it, on the one hand, possesses the great merit of implying nothing further than the immediate object of its designation, it, on the other hand, has so engrafted itself on the languages of nations, that to ignore its existence would be but pedantry.

The definitions which different authors have imposed on the words Cancer and Malignant Growths have been of a twofold nature: either they have, aiming at simplicity, endeavoured to identify the class of growths in question with

* The distended subcutaneous veins have been compared to the claws of a crab, of which the tumour represented the body. "Tumor evadit magnus et cum *venis circa circumtumentibus et livenlibus instar pedum cancrinorum* unde etiam nomen habet, se prodit." (Ettmüller, *De Morbis Virorum, Mulierum et Infantum*, cap. 10.) Ambroise Paré seeks to impress the name by an actual drawing of a crab. "D'autres auteurs ont expliqué ce nom par rapport à la douleur rongeante que cause cet horrible mal." (*Traité du Cancer*, par Alliot. Paris: 1698.)

one single attribute,* or they have, with perhaps less regard to analogy with the exact sciences, but with more to that of truth, applied these names to a class of adventitious products, possessing an assemblage of attributes in a greater or a less degree. Abernethy has very appositely compared the different species of tumours to the primary colours of the spectrum, between which there exist all intermediate phases; so that, to pursue Abernethy's simile, even supposing we had arrived at exact definitions for the primary colours, those definitions would be more or less inapplicable to the transitional tints.

The following characters constitute the main features of cancerous growths:—

1. Their fatality is often independent of any local effect at all adequate to account for such fatality.

2. Their vegetative property; the reproduction of growths similar to themselves in different textures of the organism.†

3. Their almost constant liability to local recurrence after the most complete surgical operations.

4. Their indiscriminate involvement of all the tissues, healthy or morbid, they meet with in their progressive growth.

Of these four features the first two are especially distinctive. It will, doubtless, be remarked that in the above definition I have altogether ignored the anatomical characters of growths. This, however heterodox it may appear to the morbid anatomist, will be vindicated in the classification we shall have presently to exhibit. It will there be seen that no general features of malignancy can be founded on mere anatomical structure: that growths differing widely

* To this class belong Lebert and his followers.

† This second character, it may be noted, includes in its terms the almost specific tendency exhibited by cancerous growths to infect the adjacent lymphatic glands.

in their rough and minute anatomy may agree closely in their clinical courses and terminations. I am not singular in this opinion. One of the most philosophical pathologists of the day has well observed, "the distinction between innocent and malignant tumours is probably one not of mere visible structure, but of origin and vital properties." Carl Wedl, too, whose work one could have imagined would have given his thoughts an opposite tendency, has equally well remarked that "the idea of *malignancy* of new formations is only relative, connected with a *dyscrasis* of the blood, which has not yet been elucidated."

Designating, then, by the terms *Malignant Growths*, or *Cancer*, all growths which possess, in a greater or less degree, the *clinical* attributes enumerated above, we may again subdivide them into so many species, according to their *anatomical* peculiarities.* Proceeding on this principle, we have the following classification:—

Genus: MALIGNANT GROWTHS.—CANCER (*Auctoris*).

Species.

1. Scirrhus } Cancer, *vulgo sic dict.*
2. Encephaloid }
3. Melanosis.
4. Nævoid Cancer (?) (Auctoris).
5. Villous Cancer (?) (Rokitansky).
6. Osteoid Cancer (Müller, Paget).
7. Enchondromatous Cancer (Auctoris).
8. Colloid Cancer.
9. Fibrous Cancer (Paget).
10. Fibroplastic Cancer (Velpeau).
11. Epithelial Cancer (Paget, Schuh).

* The anatomical characters of the rarer species (Nos. 3 to 10) are illustrated by the *cases* adduced: those of scirrhus, encephaloid, and epithelioma, are sufficiently well known, so as not to need any further illustration here.

The following explanatory commentaries on these several species of cancer may not be misplaced:—

(1) SCIRRHUS and (2) ENCEPHALOID constitute the great mass of cancerous tumours, of which they are the generally accepted representatives.

(3) MELANOSIS has been admitted as a distinct species rather from its clinical relations, than from its anatomical structure. That in this latter particular it is nothing more than encephaloid impregnated with pigment, is easily demonstrable; but the special ages and localities it affects, and its high degree of vegetative faculty, entitle it unquestionably to a distinct specific position.

The following case affords a good illustration of the disease:—

CASE. *Melanosis of the Eye-ball: Operation: Death, with Secondary Deposits on the Brain, in the Lungs, Liver, and Mesenteric Glands.* Charles L. was aged 53 years when he was admitted into University College Hospital, under Mr. Erichsen, for a tumour of the left eye-ball. Some eight or nine years before his admission into the hospital he received a blow above the left eyebrow from an iron rod; he did not experience any great pain in the eye, but the sight of it gradually dwindled away, till at last it was entirely gone. Seven years afterwards he was under Mr. Moore at the Middlesex Hospital for what is entered in that gentleman's case-book as "inflammation in an eye destroyed seven years ago by traumatic inflammation; eye large, and full of green lymph." The eye continued red, and occasionally painful, for a year after, and about this time (eleven to twelve months ago) he first began to notice it swelling.

He has lost a good deal of flesh, but otherwise his health has been pretty good. The tumour has never bled, excepting slightly in removing the dressings.

The following notes were taken a week before he was operated on:—

Local Appearances. Projecting from between, and displacing the eyelids, is a tumour, reaching from the outer canthus to nearly the side of the nose; its greatest measurements are, from above downwards, one inch and a quarter; from side to side, two inches. The surface of the tumour is smooth; its colour dingy, light, purplish-red; its feel hard, with a certain degree of elasticity, though retaining, at some spots, the impression of the fingers. The cornea is shrunken, and externally angular in outline; the pupil is filled with an opaque, whitish-buff substance, and its form distorted. The eyelids are not hypertrophied; the lower one bulges inferiorly, is pale and œdematous; the upper one is but little altered in appearance. There is a thin discharge from the tumour, never, as far as he has observed, of an offensive character. He has not suffered any pain in the eye for some time now; when he did, it was of the most acute description, and was felt principally in the supraorbital and occipital regions. He states he can still distinguish light from darkness with the eye.

General Appearance of the Patient. He is tall and excessively wasted. His features are pinched, his cheeks sunken, his face partaking, in fact, in the general emaciation of the body. His complexion is remarkably dingy and icteric, his hair black, his right eye dark. He is a very intelligent man, and gives a straightforward account of his malady.

His parents died at an advanced age. His mother's sister had some tumour of the breast, of which he thinks she died. His own health had always been good; he never exhibited any phthisical or rheumatic tendency.

Mr. Erichsen removed the tumour by the ordinary method; in order, however, to ensure its complete destruction, after he had dissected out all that could be felt or seen of the growth, he applied the actual cautery to the entire surface of the orbital cavity—a proceeding calculated also to arrest any hæmorrhage that might ensue.

In order to present the reader with the whole of the anatomical features of this case at once, I shall defer noticing the characters of the growth, till I have briefly related the further progress of the case.

All went on well till a fortnight after the operation, when he began to be troubled with transient shooting pains in the orbit, and in eleven days afterwards an irritative form of diarrhœa set in; however, it was not till about six weeks after the operation that any symptoms occurred calculated to create much apprehension. He was then seized with an epileptiform fit; and when I saw him on the following day, he returned no answer to me, when I spoke to him, although he kept his eye fixed on me, following me, when I was leaving the ward, as if he knew me; yet I do not think he possessed much remaining consciousness. He moved all his limbs well. The pupil was moderate in size, and acted pretty well. His tongue was thickly coated with a moist white fur; his pulse was 140 (his average pulse was 80 before). His general condition reminded me altogether a good deal of what I had observed in several cases of traumatic affections of the brain under the name of "cerebral irritation." When I saw him two days afterwards, he was dying. His face and body generally were covered with a profuse sweat; he was in a state of extreme exhaustion, yet, to all appearances, conscious. His pulse was about 160; very unequal and fluttering; his respirations 48; his tongue dry, rough, and brown; his pupil of medium size, acting well. He died the following day.

Anatomy of the Primary Tumour. The tumour was,

at the first glance, seen to be melanotic cancer of the eyeball. The special relations of the melanotic deposit were well exhibited by a section through the middle of the tumour, carried from behind forwards through the mass of the growth and the remains of the shrunken eyeball. The ocular conjunctiva was found greatly expanded, and, at the same time, thickened; the sclerotic coat was comparatively unaltered, although shrunken and wrinkled. Between these two tunics lay the chief mass of the tumour. This consisted of a layer of firm, lobulated tissue, of a deep bistre colour, which adhered but loosely to the inner surface of the conjunctiva, but very intimately and firmly to the subjacent aspect of the sclerotic. The average thickness of the mass was one inch and a half. Beneath the sclerotic were the remains of the choroid, of a browner hue than natural; beneath this was a lenticular mass of melanosis. All that remained of the lens was a tough indurated mass of buff-coloured lymph (?). After prolonged search, no remains of the optic nerve could be detected. The sclerotic did not appear to have given way at any point.

Minute Anatomy of the Growth. The subconjunctival (great) mass of the tumour required to be acted on by chlorine water, before its elements could be well discriminated. It was then found to consist of cancer-cells, intervening granular matter, numbers of fine fat globules, and still unbleached pigmentary masses. The intraocular mass differed from the above in containing no cancer-cells. Some of the muscular fibres of the external rectus, which were examined, were seen to have lost all traces of striæ, but had a uniform nebulous appearance.

Post Mortem Examination. *Head.*—On opening the cranium, about two ounces of slightly bloody serum were found in the arachnoid cavity; the arachnoid was thickened here and there by old lymph. The pia mater was somewhat hypervascular. On the upper surface of the cerebrum was a small melanotic mass, which encroached slightly on the brain substance. No evidence of disease was found in the brain. The optic nerve of the affected side differed from that of the sound side, in being smaller and more transparent. No melanotic extension had occurred from the orbit, nor was any secondary deposition found in this cavity itself. *Lungs.*—The *right* lung was consolidated and hepatised nearly throughout its substance, the character of the hepatisation being intermediate between that of the red and grey varieties, but approaching closer to the latter. Here and there a melanotic tumour was found in the interior of the lung, but a greater number were found at the surface, projecting from this in the form of disks. The average size of these growths was about that of a filbert. The lung-substance immediately around one of the deeper tumours was found not farther advanced in hepatisation than that at a considerable distance from it, and that around one of the superficial tumours was found little more than highly congested. I was able to trace distinctly the pleural membrane over one of the projecting nodules of melanosis; it exhibited no extra vascularity. The *left* lung was at parts much congested, but not consolidated. Scattered through its substance were some melanotic tumours, but very few were apparent on the surface. *Liver.*—In this organ were several large masses of melanosis, their average size being that of a very large walnut. Some were of a deep Indian ink colour, and soft, others harder, lighter in tint, and showing a somewhat radiated structure. The former were so densely impregnated with pigment granules, that nothing else could be defined with the microscope; in the latter, cancer-cells and nuclei were observed. The hepatic cells of the adjacent liver-substance were considerably filled with bright

fat globules. Many of the *mesenteric glands* were much enlarged by melanotic degeneration. The *kidneys* and *spleen* appeared sound.

(4) Nævoid Cancer (?). *Auct.* The claims of this species, although tacitly admitted by the nomenclature of eminent pathologists—"Carcinoma cirsoides", *Müller:* "carcinoma telangiectodes", *Virchow;* "cavernous cancer", *Esmarch*—must still be regarded as doubtful.

Müller relates a case.

Case. A woman of cachectic appearance had a deeply seated tumour in the arm; amputation was performed. This tumour consisted of "very considerable enlargements of softened blood-vessels and of blood extravasations." In the course of half a-year she died. In the abdomen were found great masses of grape-like (*traubigen*) enlargements of vessels filled with blood.

He further illustrates the subject by reference to a case of Walther's, which, not being very well known, I quote at some length.*

Case. A student had two congenital mother-marks on his right leg. One remained stationary; the other increased, and, "at his twentieth year, had a length of three inches, and a greatest breadth of a little more than an inch and a half. It formed a flat tumour. The skin was here discoloured brown, playing into bluish; the surface of the tumour rough and uneven, permeated by many visible small vessels." Professor Walther extirpated it. The operation wound was a long while healing, and the smaller tumour threw out small fungous sprouts in the subcutaneous cellular tissue; the cicatrix of the operation never broke out again. About three years after the opera-

* Journal der Chirurgie und Augenheilkunde, von C. F. Gräfe und Ph. v. Walther, bd. v, p. 261. Berlin: 1823.

tion, he had considerable hæmoptysis, which occurred repeatedly, and in eleven days more he died.

At the autopsy, Professor Mayer found in the "panniculus adiposus a mass of oval, reddish, pretty consistent" bodies or fungi, mostly arrived at the size of a bean—about 20-25. Their simplest form was as follows: a process of the cellular tissue received a small vascular branch, which spread itself like a tree, and formed an oval vascular network. "Perfectly developed, they were consistent, externally and internally reddish, rich in blood, and showed, on section, some enlarged mouths of vessels." "On a section of the lungs, there were perceived several round defined bodies, which felt hard, and consisted principally of enlarged blood-vessels. This enlargement of the vessels was exhibited still more clearly when the lungs were placed in spirit. Then it was seen that these enlargements of the blood-vessels were not limited to those bodies, but pervaded in a less degree the whole parenchyma of the lungs." "When mercury was injected into the arteries, veins, and air-tubes, it made its appearance at the greatly enlarged mouths of the blood-vessels and the bronchia." Professor Walther describes it as a case of fungus hæmatodes.

Cruveilhier* relates the following case:—

Case. A lady had on her head a dozen or so soft nævoid tumours, of about the size of a large nut, pulsating synchronously with the heart. At the inner side of her left thigh was a similar pulsating tumour, the size of a fist; one surrounded the upper part of the right humerus; one was situate on the left shoulder; whilst another was connected with the anterior extremity of the third rib. The patient ultimately died marasmatic. After death, the

* Cruveilhier's "Anatomie Pathologique du Corps Humain" (1829-35), liv. xxxiii, pl. xv.

tumours of the head were found to be generated in the osseous tissue (which was gnawed through) of the vault and lateral regions of the cranium. The tumour of the humerus had destroyed nearly all the adjacent bone. The tumours of the thigh and shoulder were developed in the soft parts. "All the pulsatile tumours were constituted by a cavernous tissue, whose fibrous areolæ were filled with blood. All the other organs of the body were healthy.

Cruveilhier, in his most recent work,* denies the possibility of erectile tumours running a malignant course. He considers "that the pulsatile tumours of bone are constituted by a cancerous tissue, ordinarily encephaloid"; and, citing the above case, draws an "impassable line of demarcation between *erectile* tumours and *pulsatile* tumours."

I have no doubt myself that all the cases which have been regarded as vascular tumours running a malignant course were really cases of encephaloid cancer, in which the vessels were developed in extraordinary number and degree. I am able to adduce a very remarkable case strikingly corroborative of this opinion.

Case. Edward W., aged 61 years, entered the Middlesex Hospital some years ago, for violent hæmatemesis, and, some time subsequently, for equally severe hæmaturia. Ever since he could remember, he had had a number of vascular tumours in different parts of his body. Over the outer third of the right pectoral muscle was one of the size of a small walnut; above it were two smaller ones; over the right deltoid muscle, one of about the size of a filbert. Above the right clavicle was one larger than either of these. He had a small one in the dorsum of the cleft of the right

* Traité d'Anatomie Pathologique Générale, par J. Cruveilhier, tom. iii. Paris: 1856.

thumb, and one over the first phalanx of the left ring finger; several small ones about the neck, and one above the left clavicle. On the inside of the left angle of the lip were one or two, and on the mucous membrane of the inside of the cheeks, deep back in the mouth, were two or three of about the size of a pea on either side. The left half of the tongue was irregularly swollen out by venous growths. On the glans penis were several such tumours, of about the size of those inside the mouth.

Curiously enough, although suffering from the effects of fistula *in ano*, when I last saw him in the hospital, under Mr. De Morgan's care, he had never had bleeding from the rectum, excepting twenty years ago, but appeared now to be subject to prolapsus of the anus. He was a good deal emaciated, and had a sallow flabby look about his face. Numerous minute varicose veins supplied the healthy blush on the cheeks; in these were several very minute vascular prominences.

These nævoid tumours varied considerably in appearance, and in their relation to the cutaneous structures. Some were entirely beneath the skin, under which they felt like rolling, round, encysted tumours, made but little prominence, and were rather appreciable to the sense of touch than to that of sight. Some, on the other hand, had that peculiar pale venous-blue hue of the subcutaneous nævi of children; whilst a third set formed rounded, thin, walled, dark, purple tumours. They could all be partially emptied of their blood by pressure, filling again when this was removed. None pulsated in the slightest degree.

Here, then, we have a multiple dissemination of non-malignant tumours, which, by their presence, in all probability, in the hollow viscera, had given rise to severe local effects, but yet, after existing for years, had caused none of that undermining of the general health so often ob-

served in conjunction with a single cancerous tumour, to all appearances, comparatively to these venous growths, innocuous by its mere local effects.

(5) VILLOUS CANCER (?) (Rokitansky). Two cases of this disease have fallen under my observation,—one of the rectum, one of the bladder. Of the latter, I subjoin the following brief history; for which I am indebted to Mr. Quain.

CASE. James J., aged 34 years, came under Mr. Quain's care in University College Hospital, in November 1854. Upwards of three years previously, he first noticed blood in his urine; this had continued up to the present time, but now and then had ceased—once for as long a period as seven months together. After a time, symptoms resembling those of stricture supervened; incapacity to fully empty the bladder, incontinence of urine, and pain in passing his water. He had, in addition, pain and tenderness over the renal regions, especially the left, but none over the bladder.

At the *post mortem* examination, a florid red flocculent growth was found attached by a peduncle to the right side of the base of the thickened bladder. The kidneys consisted principally of the greatly distended pelves and calices; the ureters were also much enlarged. The liver appeared healthy. The heart was hypertrophied; the lungs congested. *No morbid growths were discovered in any other part of the body.*

I have retained the name "villous cancer" for this disease, rather from deference to the opinions of the eminent pathologists who have described it under that name, than from my own conviction. This conviction is, that it is not a constitutionally malignant disease; in a word, no form of cancer. This opinion rests on the following facts:—

1. No secondary deposits of the same form of growth

have ever been found associated with the primary growth.

2. The cause of death from this disease is not from any general infection of the system, but from the local hæmorrhages, accelerated by intercurrent affection of the viscera.

It is a fact not unworthy of remark, that in most of the reported cases the hæmorrhage has not been constant, but has ceased at intervals: in the case narrated above, once for as long as seven months together. In all the cases occurring in the bladder, disease of the kidneys and their excretory apparatus has ensued—a fact not without its practical bearings, liable, as it is, to divert attention from the real seat of the disease.

There is reason to believe that two distinct species of growths have been confounded under the term "villous cancer": one, a truly cancerous growth, for the greater part dense and solid, but terminating in some villous prolongations; a second, containing little or no solid material in its construction, but consisting nearly entirely of vascular, villous, pencil-like processes, and in many instances attached by a narrow peduncle, from which the villi radiate and spread out in all directions.

As an instance of the first, the following case from Rokitansky's paper on the subject* may be quoted.

Case. A woman, aged 68 years, had primary cancer melanodes of the right eyeball. After death, the liver was found "permeated by very numerous medullary growths, varying in size from a walnut to a fist, tuberously prominent at the surface, partly pale, partly deep greyish brown, here and there also white." Three large masses on the

* "Ueber den Zottenkrebs, von Prof. K. Rokitansky", in the "Sitzungsberichte der Mathematisch-naturwissenschaftlichen Classe der kaiserlichen Akademie der Wissenschaften. Bd. 8. Jahrjang, 1852. Wien, 1852." Page 524.

front border of the right lobe became gradually looser in texture, and terminated in "an aggregate of very loosely connected villi."

The case observed by myself (*suprà*) offers a good illustration of the second, the simple form of the disease.

3. Another great argument in favour of these views, is that in those instances, where the growth has been removed and the patient has survived the operation, it has not recurred. Professor Franz Schuh removed a "villous cancer" from the rectum of a woman in October 1846.* In a letter, dated July 21st, 1856, he writes me, "the patient is still in the best health." Professor Quain removed a typical specimen of "villous cancer" from the rectum of an old lady;† it has not recurred up to the present time, upwards of two years after the operation. Professor Schuh writes me of another case, in which he operated successfully nine months ago. This latter surgeon lost one patient from pyæmia, and a second from hæmorrhage, after the operation.

(6) Osteoid Cancer (Müller, Paget). The osteoid order of growths has so unequivocally been proved to be of a malignant nature, that any further explanation of their position in the preceding classification is superfluous. The following case may be taken as a representative of the species.

Case. *Osteoid Cancer of the Femur: Death: Secondary Deposits in the Lungs, Omentum, and Diaphragm.* James V., aged 55 years, a cattle dealer, was admitted into the University College Hospital, under Mr. Quain, for a tumour of the right thigh. He had suffered for the last two years

* Vide "Pathologie and Therapie der Pseudoplasmen, von Dr. Franz Schuh; Wien, 1854"; page 432.

† Vide "The Diseases of the Rectum", by Richard Quain, F.R.S. Second edition. London, 1855. Page 295.

from a dull aching in the lower part of the affected thigh, which caused him to limp in walking. The leg, too, would swell in the course of the day, but went down again in the night. Eleven months before his admission into the hospital, whilst leaning against a hurdle at a cattle market, a sheep ran its head against the lame limb; he fell, and the thigh bone was found broken at its lower third (by the sheep, he stated, not by the fall). The fracture was adjusted on a long splint, but united badly; so that all he could do after a time was to bear on his toes with the help of crutches. At a later period, he met with a second accident: he was being wheeled about in a chair, when he was thrown out, and the injured limb, although not directly struck, was much shaken, and soon afterwards began rapidly to enlarge. He had noticed a distinct tumour for the last four months. On his entrance into the hospital, he had a large tumour, measuring 23-24 inches in its greatest circumference at the lower half of the right thigh; this tumour was of a stony hardness and resistance, excepting at its inner side, where it felt elastic. This latter part differed also from the rest of the tumour, in forming a kind of secondary, red, carbunculoid prominence, which at its centre displayed a somewhat sloughy, but yet not malignant looking ulceration. The skin over the rest of the tumour, with the exception of a few dilated veins, appeared natural. The thigh above the tumour was much swollen, but felt sound. The inguinal glands were enlarged and tender. The outline of the patella could be easily defined with the finger. The whole leg and foot were swollen and somewhat brawny, but neither discoloured nor tender. The pain in the tumour itself had never been very acute, but had been much worse in the leg, where he compared it to "a thousand pins pricking" him. Two months before, the softer portion of the tumour had been lanced; about a

couple of ounces of bloody serum came out. When Mr. Quain subsequently punctured it, only blood exuded.

He was not aware of any consumptive tendency in the family, but a grandmother and a sister had both died of cancer. He was an intelligent, tolerably healthy looking man, though his skin had a yellowish cast, and numerous small varicose veins supplanted the colour in his cheeks. He had been losing flesh for the last seven or eight months: this he attributed to confinement in bed; for he had previously been a most active man, and was well known in his part of the country for his skill as a cricketer.

Such were the main facts of a case which may seem very clear to the reader of it, as it now stands, but which gave rise at the time to serious doubts as to its true nature. Was it a case of diseased callus, or was it cancer of the lower end of the femur? These doubts were very soon removed. The ulceration of the skin at the inner side increased, exposing a fœtid, foul, greenish-black surface, devoid of granulations, which bled from time to time. He lost flesh rapidly, and got weak; his tongue became furred, and he complained greatly of thirst; his urine got loaded with urates, and his loins tender. Bed-sores formed over the left calcaneum, the right trochanter, and a considerable one over the sacrum. A large portion of the fungus sloughed away, attended with bleeding, which required the application of matico leaves to stop. Shortly before death, his breath acquired that peculiar sickly sweet odour which has been supposed to be indicative of purulent fever.

Post Mortem Examination, twenty hours after death. The lower part of the femur was enveloped and confounded in a large bony growth. The lower articular surfaces had remained intact, but beyond these the tumour had effaced all vestiges of the bone from which it had originated. Above the tumour was the rounded end of the femur, which hence upwards had preserved its pristine characters unimpaired from this, its point of fracture. The tumour was 6 or 8 inches long, and about 16 inches round: its surface was tuberous, its general outline round, but shelving off internally into a central depression, which was bounded outwardly by four large irregular nodulations of the surface. Into some parts of the tumour the knife sank, as it would into soft cancellated bone, but in others the shell of osteoid tissue resisted the passage of the knife altogether. Behind, the upper part of the growth was represented by a sloughy soft tissue, excavated in part, and containing some irregular bony fragments in its substance. There was no kind of transition whatever between the hard and soft parts of the tumour; the limits of each were abrupt. Some of the osteoid tissue was finely speckled by short streaks of opaque white, in a more translucent, more yellow basis. A small portion of the section in the centre had a feathery disposition of the bone. The section offered no indication whatever of the shaft of the femur in its substance. At the antero-inner side of the great tumour was a small outshoot of osteoid tissue upwards, firmly connected, but having no organic continuity with the upper sound half of the femur. There was a good deal of thickening of the subcutaneous tissues of the fore part of the thigh. The femoral artery was tilted forwards by a subjacent ossified mass of lymphatic glands. In about the middle third of the femoral vein, about an inch and a half from the upper part of the tumour, was an elongated osteoid deposit, about the size of a small bean, attached at its ends and on one side to the inner coat of the vein by a soft substance. *Brain and Membranes.*—Healthy. *Heart.*—Weighed 9¾ oz. Valves and muscular substance healthy. *Lungs.*—Left lung weighed 13½ oz.; its whole surface studded over with plates of osteoid deposit. I counted on the outer surfaces

of the upper and lower lobes respectively twenty and eighteen such plates; on the inner surface of both lobes, twenty; on the base of the lung, seven: altogether, sixty-five. The smallest plate seen was about the size of the section of a mustard seed; the largest measured an inch and a half by an inch. The general shape of these plates was flattened superficially, in conformity with the outer surface of the lung (above which they rose but very slightly)—more nodular and irregular at their deep surface. Some deposits within the lung substance were altogether nodular in form. The superficial contour of the plates was mostly rounded, but sometimes trapezoidal. Around these the pleura was puckered into a number of fine radiating pleats, but the lung substance itself was not drawn in, was crepitant, and, to all appearances, quite unchanged; so that these osteoid deposits might be looked on in the light of simple foreign bodies imbedded in the pulmonary tissue. This in a measure accounted for the absence of all chest symptoms during the patient's life time. Right lung weighed 22½ oz. On the outer surfaces of the two upper lobes, the number of deposits was twenty; on that of the lower lobe, sixteen; on the inner surfaces of both lobes, fifteen; on the base of the lung, ten; together, sixty-one; so that both lungs were pretty equally affected. At the outer aspect of the lower lobe, near the base, was a patch of pulmonary apoplexy, an inch and a half across, by two inches long. In all other respects, this lung agreed with its fellow. *Liver.*—To all appearances, healthy; weighed 53 oz. *Kidneys.*—Sound. *Omentum.*—In its lower border an osteoid deposit, the size of an "agate" marble. The anterior layers of the omentum glided easily over it, but the posterior adhered round the diameter that separated its anterior and posterior halves. *Diaphragm.*—Above the left half of the cordiform tendon, lying in the very thin muscular substance, was a deposit of osteoid matter, resembling in size and shape an olive-stone.

Minute Anatomy of the various Growths. I. *Tumour of the Femur.* *(a)* The dense hardest osteoid tissue showed no definite structure, but an irregularly "loculated" appearance. *(b)* The less hard, but still firm osteoid tissue, exhibited, in fine sections, an irregular, ill-defined fibrous arrangement of its elements; but, on the addition of hydrochloric acid, an abundance of carbonic acid bubbles were evolved, and, in a good many points of the section, a finely fibrous structure was brought out, which appeared due either to elongated nuclei or to fibres closely packed, and differed altogether from the microscopic characters of ordinary cellular tissue. No structure of true bone was observed. Some fibro-plastic cells and quantities of nuclei were seen in washings of the tissue. *(c)* The soft non-osteoid component of the tumour had no tendency to transition into the osteoid substance, where the two came in contact. Some of it bore a naked-eye resemblance to some varieties of medullary cancer. One portion is described in my note-book as "a stratum of a grey, somewhat translucent, soft, but consistent tissue, with points of hæmorrhage in it, and in no way differing from ordinary encephaloid disease." Yet the microscopic characters of this latter were not those of cancer; it was, on the contrary, a true fibro-plastic development. All modifications of form of the fibro-plastic cell, nuclei varying in form from oval to fusiform, and multitudes of fine oil-globules, were its elementary constituents. Their sections had a well marked fibrous appearance, from the parallelism of these elements; these were at some parts entirely fusiform nuclei, forming what might be not inappropriately termed a "nuclear" tissue.

II. *Tumours of the Lungs.* The surface of many of

these showed a spicular feathery structure, the spiculæ radiating from the centre to the circumference, with fine vessels running parallel between them: indeed, the great vascularity of some of these plates was remarkable. A thin section, treated with hydrochloric acid, and examined with a high power of the microscope, displayed—(1) *fibrous* structure, the fibres being all arranged in parallel layers, which often had a lacuniform arrangement—an approach to Haversian canals; studding the section irregularly over were seen very distinct lacunæ and canaliculi; (2) a "nuclear" structure, of the description mentioned supra.

III. *Tumour of the Omentum.* This had much the aspect of the tumour of the thigh, but was much more vascular; indeed, it resembled closely a portion of inflamed bone. The microscopic characters were also similar, excepting that the fibrous structure was much more distinct; and that there were no cell-nuclei. A quantity of minute narrow nuclei were seen, and here and there a solitary fibro-plastic corpuscle.

Throughout a laborious examination, of which the above are the results, no cancer-cells nor cancer-nuclei were observed.

(7) Enchondromatous Cancer. (*Auct.*) This species is founded on two well recorded cases of the most conclusive characters.

Case. *Enchondroma of the Testis: Operation: Death: Autopsy: Secondary Enchondromatous Deposits in the Lymphatic and Vascular Systems, and in the Lungs.* Henry Wynd, aged 37 years, received an injury to his back and his right thigh, two years before his admission into St. Bartholomew's Hospital, under Mr. Skey. Some swelling of the right testicle ensued; but this did not begin notably to enlarge till, a year afterwards, the organ got bruised by an iron bar falling on it. Before the patient was operated on, the testicle had attained a transverse circumference of ten and a half inches; was hard, heavy, and tender. The spermatic cord was similarly affected. After the operation, the tumour turned out to be an excellent example of enchondroma of the testicle, and to be composed of "tortuous, cylindriform, and knotted pieces of cartilage." The epidydimis was healthy. The patient recovered well from the operation, but soon returned to the hospital, feeble and emaciated, exhibiting a breathlessness which, increasing, cut him off suddenly in less than three months after the operation.

At the *post mortem* examination, the spermatic lymphatic vessels were seen to contain deposits similar to those in the testicle,* and "became connected at their upper part with a swelling of the size and shape of a hen's egg .... probably a diseased lymphatic gland .... which adhered to the vena cava inferior .... and projected into the cavity of this vein." "Beyond this point, no affection of the lymphatic system could be traced .... the growth in the vein was branched like a stunted leafless shrub .... and in direct contact with the venous blood." "Both lungs were enlarged by the formation in them of masses of cartilage in such abundance that the two lungs weighed eleven pounds and a half. "In many of the larger branches of the pulmonary artery, small shrub-like growths, like that in the vena cava inferior, were attached to the lining membrane." No other organ of the body was found diseased.

* It is not often that we have an opportunity of anatomically demonstrating the presence of morbid material in the lymphatic *vessels*. Sir A. Cooper relates an instance of cancer of the testicle, in which "the *absorbents* of the spermatic cord were very considerably enlarged, their coats thickened, and small tumours appeared at irregular distances, arising from a diseased and enlarged state of their valves. These vessels were entirely impervious, and contained matter similar to that found in the testicle." The thoracic duct, receptaculum chyli, and lumbar glands, were similarly diseased. (Sir A. Cooper, in *Medical Records and Researches.*)

"The cartilage, in every seat of its growth, was of the true or hyaline kind." Professor Paget very kindly showed me the various preparations above referred to, and also gave me a section of one of the lungs, of which I subjoin the following description from my note-books:—"The section was crammed with cartilaginous tumours, of the average size of a hazel-nut. They were connected but laxly with the surrounding pulmonary tissue, and could be easily and cleanly enucleated with one's fingers. Each was enveloped in a thin pseudo-cyst of cellular tissue, which, branching inwards, subdivided each tumour into a number of small lobes. The cartilage was blueish and translucent, cut like other cartilage, and agreed essentially in its minute characters with that of the ordinary cartilage of joints. The matrix of the cartilage-cells was finely nebulous; the cells themselves exhibited great variety of forms—round, triangular, elongated, etc., and filled limited lacunæ in the matrix. In some instances, the cell occupied but a small portion of the lacuna, in others it filled it, and in most cases each lacuna contained more than one cartilage-cell. This was well defined, and possessed generally a round dark nucleus, and a good deal of coarsely granular matter."

The second case is that of M. Richet, reported in the *Gazette des Hôpitaux*, Nos. 71 and 95 for 1855.

CASE. *Enchondroma of the Scapula: Operation: Death: Autopsy: Secondary Enchondroma of the Lungs.* A man, aged 34 years, had had a tumour growing on the right scapula for four years: by that time it had attained the size of a child's head. M. Richet removed it, together with a considerable portion of the scapula. "The tumour originates from the bone, which it completely surrounds; it does not rise beyond the level of the spine of the scapula. It is enclosed by the periosteum.... It is composed of a tissue of a gelatinous appearance, but of the consistence of somewhat softened cartilage. This substance is homogeneous, transparent, traversed by filaments of fibro-cellular tissue, which appear to subdivide it into so many lobules or loculi.

"The microscopic examination, made by Messrs. Giraldès, Broca, and Verneuil, proved that the tumour was exclusively formed of large cartilage-cells and nuclei."

The man died a fortnight after the operation.

At the *post mortem* examination, at least thirty tumours were found in the substance and on the surface of the two lungs, some the size of a millet seed, the largest that of a nut. "This latter one offered all the external characters of an enchondroma; it was, in fact, cartilaginous tissue; and the microscopic examination, made with the greatest care by Messrs. Broca, Giraldès, and Robin, proved that these tumours contained nothing but cartilage-cells."

Rokitansky, without offering any further explanation, states that he "has seen it *(enchondroma)*, on several occasions, in the lungs;" and that "enchondroma is benign, provided it does not enter into any specific infectious metamorphosis."*

(8) Colloid Cancer. My personal experience of the

* Since writing this, I have received a letter from Professor Rokitansky, from which the following extracts are made:—"In those cases of enchondroma in the lungs, which I have seen, it was quite solitary." In the second paragraph, quoted above, from his work on Pathological Anatomy, he is especially alluding to those deposits of cartilage, met with in medullary cancers (*e. g.*, in the testicle). In regard to the two cases of "enchondromatous cancer", on which I have founded this species, he says: "It is perhaps not well made out, that the enchondromata in the lungs were developed after the extirpation of the enchondromata of the scapula and testicle; they may perhaps have existed already simultaneously with those enchondromata of the scapula and testicle." It will be remarked that the Professor suggests a different interpretation of the facts of these two cases, to that adopted by Professor Paget and myself. Which of these interpretations is more in accordance with the principles of inductive reasoning, I leave to my readers to determine.

surgical forms of this disease is too limited to warrant me in offering any definite opinion as to its precise nature.

(9) Fibrous Cancer (Paget). Of this form of malignant tumour, Paget gives three cases.* The first of these is especially conclusive, both from its intrinsic characters and the high degree of authenticity it derives from the distinguished pathologist who has recorded it.

Case. Mr. Paget removed the breast of a woman, aged 47 years, for a large tumour of ten years growth, but which, having been struck seven weeks before Mr. Paget saw her, had increased so rapidly, and become so painful, as to induce her to submit to an operation. "The cut surface could not be distinguished from that of an ordinary fibrous tumour of the uterus .... and microscopic examination could find nothing but a tough, compact, well formed fibrous tissue, with imbedded elongated nuclei." Suffice it to add, the tumour recurred three months after the operation, sloughed out, and in about another two months she died, with a huge cavity in her breast. The point of the case, however, is, that, at the *post mortem examination, both lungs contained between twenty and thirty small tumours, similar to the first and second tumours of the breast—"complete fibrous tissue"*.

(10) Fibro-Plastic Cancer (Velpeau). Of this species, I will, in the first instance, narrate the following interesting case, which, having had under observation for two years, I have been able to investigate with an unusual degree of care.

Case. *Fibro-Plastic Tumour of the Orbit: Three Operations: Three Recurrences: Death: Autopsy: Secondary Fibro-Plastic Growths in the opposite Parotid Region, the Dura Mater, and the Pleura.* Susannah Foster was 6 years old

* Paget's "Surgical Pathology", vol. ii, p. 150.

when she first came under my observation. This was on the 12th of October, 1853. Her parents brought her to University College Hospital, to consult Mr. Quain regarding a protrusion of her left eyeball. They said the child had been delicate from her birth, and had been much subject to coughs and colds, and to bleeding from the nose; and, for the last three or four years, she was in the habit of sweating at night, and, three years back, had a bad cough, with bloody expectoration. Her intellectual faculties had always been remarkably keen. For nearly two years, a difference had been observed in the two eyes; "the left one appeared slightly less than the right, rather drawn back, and a little turned." Six weeks before we saw her, she fell on the front of her head, and from that time onwards the right eyeball was noticed protruding. The left eyeball now protruded considerably, was at the same time turned downwards, and felt rather harder than the right one. The pupil acted well, and vision was perfect. The upper eyelid was suffused, and its veins were enlarged. The child pointed to the outer canthus, and said "it pricked her". She was a fair-haired little girl, with a thin delicate skin, long eyelashes, and prominent upper lip, and was remarkably acute and intelligent. Strange to say, the child outlived both her parents; for the father and mother died of phthisis during the progress of her case. In the father, Dr. Peacock writes me, "there were decided evidences of tuberculous deposits at the upper part of both lungs". A letter from the mother's medical attendant, Mr. Luke, informs me that "she died of phthisis". I, on one occasion, saw one of her brothers and three of her sisters; they appeared to me healthy children, had delicate fine skins, and blue eyes. Between this report and the following one, the protrusion of the eye increased—remarkably so in the week preceding her entrance into the hospital. This was on the 29th of

November, 1853. Three days before, the child had been playing about as usual, and up to that time her eyesight had remained good (her father told me "he had often tried her sight", and thought, if there *was* any difference, she saw the better out of the protruded eye); but, on the evening of that day, after the child had been put into bed, she became restless, and complained of pain in the head (apparently the left side only) and eye, and in the lower part of the abdomen. Since that, her mother said, she would start up suddenly in bed, lay herself down again, and then begin rambling. The eye had been discharging offensive matter.

The following are the chief facts in her diary whilst in the hospital.

Nov. 29th, 1853. She was admitted. The left eyeball protrudes about one inch beyond the level of the right one; the eyelids are lividly red. The ocular conjunctiva is, in its upper half, slightly injected; in its lower half, dusky red, and chemosed. Exposure to the light gives her most intense pain. As far as then can be ascertained, the cornea, anterior chamber, and iris, appear sound. Towards the outer half of the upper eyelid is felt a tolerably moveable plate, of the consistence of cartilage. On questioning her as to where she feels pain, she points to a spot on the temple, just at the outer canthus.

Dec. 3rd. Since the last report, the child has been quite freed from pain by small doses of laudanum. She was to be operated on to-day. Half an hour before the operation, her pulse was 120; respirations, 30; tongue moist, coated with a white fur; skin dry and hot.

Operation by Mr. Quain. Chloroform was administered. The outer commissure of the eyelids was divided, and an exploratory puncture made into the orbit; the grooved needle was felt to enter some solid resisting substance. The eyelids were now separated from the contents of the orbit by dividing the palpebral sinuses. The eyeball was then removed. A vertical section through it showed it to be unimplicated in any disease. The mass of the tumour behind it in the orbit was now removed, then some other small portions of the growth, and a small part of the optic nerve. The hæmorrhage was not great. The orbit was plugged with lint, and a compress applied.

Examination of the Growth. It was about the size of a walnut, in form rounded, with one or two lobes on its surface. It cut very firm, its sharply defined section was of a dirty yellowish grey colour, much like that of the grey substance of the brain, only of a deeper hue; there was not the slightest translucency in the tint, which was opaque and dead, and the whole surface had a remarkably uniform homogeneous appearance, excepting a slightly elevated and lobulated nucleus of a rather lighter colour than the adjacent portion of the growth; there was but a single red point, about the size of a pin-head, on the section, otherwise not the slightest trace of vascularity was to be seen.

In tearing out fine shreds with needles for the microscope, the tissue of the growth was found to be very tough, and not to exhibit any tendency to tear in any one particular direction.

Minute Anatomy. Three chief elements constituted the mass of the growth :—

1. Fibres intersecting one another in all directions.
2. Nucleated laminæ of various forms and sizes.
3. Large quantities of well defined circular nuclei, lying amongst intermediate granular matter, and presenting a fine outline and a homogeneous "stumped" aspect.

Besides these, was a very fair number of *cells*, in some cases circular, in others elongated in various degrees. Of true fusiform cells, only two were observed, and those im-

perfect in their development. And, lastly, there were a few oat-shaped nuclei, which, however, presented no definite arrangement to one another.

Not a single cell had any of the characters of the so-called "cancer-cell".

The case went on quite favourably, till about the fifth day after the operation, when a smooth, oblong (half an inch long) moderately vascular fungoid growth was noticed projecting from the outer half of the lower border of the upper eyelid.

December 13th. The fungus of the eyelid has been rapidly increasing in size from day to day.

Dec. 17th. The patient continues in excellent health and spirits. The palpebral fungus has not sensibly altered, but a *second* tumour can be felt above it under the skin of the eyelid, just below the eyebrow. This latter growth is a hard, resisting (non-elastic) swelling, perfectly distinct from the fungus of the lower edge of the eyelid.

Dec. 28th. The upper palpebral tumour is much larger.

Feb. 10th. The upper tumour of the eyelid has now reached dimensions of two inches by one inch. The lower fungus remains stationary. Mr. Quain to-day removed the tumour of the eyelid, leaving, however, and dissecting off the skin of the part. The growth was found in the operation to be intimately connected with the periosteum of the orbit.

Examination of the Second Growth. It was somewhat larger than the previous orbital growth, and stated by the operator to be very intimately connected with the periosteum of the orbit; no section was made of it, but the characters of its substance, where it had been cut in its removal (with the exception of the "nucleus" there referred to), is so completely identical with those of the original growth, that the description given of the obvious physical qualities of this latter may be taken as accurately portraying those of the one now under consideration.

Minute Anatomy. On submitting a very fine section, made with a razor, to the microscope, it was found to be composed of irregularly intersecting fibres, which at the outskirts, projecting beyond the general outline of the section, were seen to possess all the optical properties of ordinary cellular tissue. On the addition of acetic acid, many parts of the section exhibited large quantities of the so-called "oat-shaped nuclei" quite similar to those observed in the original growth; but, besides being very much more numerous, they were seen to be arranged parallel to one another in the most regular possible manner.

A very fair number of rounded, mononucleated cells, too, and here and there some genuine well characterised fusiform (fibroplastic) cells, were observed.

The child left the hospital with the wound of the operation healing, and in excellent health; but for two or three days before her departure, a small nodule made its appearance just below the outer canthus; and by the 25th of March, this had extended below the under margin of the orbit inwards, and had reached the size of a horse-bean.

This third tumour grew rapidly, and was removed by a third operation. It nowise differed anatomically from the preceding two.

I saw nothing more of the child till January 30th, 1854, when her mother brought her back to the hospital. She had continued quite well after the third operation, till within the last two months. Then the tumour recurred in the eyelid, and an entirely new growth sprang up in front of the right ear. The following is a report of her condition at the above mentioned date. At present, the left upper eyelid is the seat of three tumefactions, one above and two below, separated from each other by

the T-shaped scar of the operations. The inner of the lower two tumours is of a very dark, dusky, venous hue, and feels rather soft; the two other ones are harder and not so dark. They have given her no pain. In front of the right ear is a diffuse tumour firmly attached to the subjacent parts, and apparently connected with the zygoma; it reaches to and involves the antihelix, and in this way narrows the meatus auditorius externus so much, as to give rise to considerable deafness. It was the size of a pea when the mother first noticed it: it now measures two inches by two inches; it feels very hard and resisting; the skin over it retains its natural colour. There is some discharge from the ear, and she has been much troubled with the earache, not with any headache. The left nostril is much stuffed, and blowing it gives her pain; it has bled several times. An examination reveals only some redness of the mucous membrane. The child is otherwise well and very cheerful; she has an excellent appetite, and has kept up her flesh.

Feb. 8th. A hard tumour has formed behind the pinna of the ear continuous with that in front of that organ: this posterior swelling measures two inches vertically, and seven-eighths of an inch across.

Feb. 13th. The progress of the growth is truly surprising. A fresh tumour has formed over the bridge of the nose and above the left eyebrow—extensions of the palpebral tumour. Her health is beginning to fail her. She appears to me and to her parents to have lost flesh since I last saw her; she sleeps badly; her appetite is gone; the tongue is coated. She suffers a good deal of pain in the anterior part of the aural tumour. The right eye waters a little, and its vision is somewhat impaired.

March 10th. The following measurements will speak for themselves as to the astonishingly rapid progress of the tumour. *Parotid Tumour.*—Vertical measurement, $3\frac{1}{2}$ inches; horizontal measurement, $3\frac{3}{4}$ inches. The *Fronto-Palpebral Tumour* occupies now the entire left half of the forehead and root of the nose; it measures, from side to side, $2\frac{1}{2}$ inches; and reaches, from the level of the eyebrow upward, $1\frac{1}{2}$ inch.

May 19th, 1855. Up to shortly prior to the present date, I had had the child as a patient at the Farringdon Dispensary, but about this time her father died, and her mother moved to another dwelling; and I therefore got her again into University College Hospital, where she died on the 30th of October, 1855. On May 19th, I have the following notes. *Parotid Tumour.*—Vertical measurement, $5\frac{3}{4}$ inches; horizontal measurement, $6\frac{1}{4}$ inches. *Frontal Tumour.*—Vertical measurement, $4\frac{3}{4}$ inches; from middle line above eyebrow to within an inch of ear, 6 inches. There is great uniform glossy lividity of the parotid tumour, and over the orbit: where no such lividity exists, there the subcutaneous veins are greatly enlarged. In front and behind the right ear, some desquamation of the cuticle has taken place.

Up to the period of her death, she gradually sank into such an exhausted condition, as to preclude the possibility of taking any further exact notes of the case. Pectoral symptoms, too, intervened, indicatory of consolidation and partial softening of the lung tissue. On the evening of the 30th of October, 1855, she breathed her last.

Post-Mortem Examination, Oct. 31st, 1855, 3 p.m. *Head. Parotid Tumour.*—After the skull had been cleared of all the soft parts excepting the morbid growths, the parotid tumour was found attached to the parotid, mastoid, malar, auricular (and slightly the occipital) regions, and to the side of the superior maxilla, approaching within half an inch off the outer margin of the orbit. The pinna

of the ear was greatly enlarged and thickened by infiltration with the morbid material. The shape of the tumour was circular—that of a bun—with the convex face turned outwards, and unattached. Its diameter in any direction was 6 inches. It felt hard and resisting, excepting behind the ear, where a small portion felt softer, and had a mammilated appearance. *Palpebral Tumour.*—It was formed by a great thickening and deformity of the left eyelids by the morbid deposit. The eyelashes still remained, though inverted and concealed by the diseased state of their supports. The tumour thus formed was divided into three or four divisions, which closed the anterior aperture of the orbit; but, on removing the roof of this cavity, only a trace of the morbid deposit was found on its floor. The frontal tumour was an extension of the palpebral, and, occupying principally the left frontal region, encroached on the upper half of the nose. The frontal and palpebral tumours, taken together, measured 6 inches across, by 7 inches from above downwards. The frontal tumour reached also beyond the middle line, slightly into the right frontal region.

The tumours above described, parotid and palpebral (frontal), had no connexion with one another.

On the skin being reflected from both these tumours, they presented the following characters. Of a dirty greenish grey colour, firm, consistent, and homogeneous; destitute of vascularity or hæmorrhages. Excepting the green tint (which may perhaps have been, to a certain degree, *post mortem*), the physical attributes of these growths agreed remarkably with those removed during life. The skin covering the tumours was considerably involved in the deposit, but the cranial bones appeared free from disease. *Brain.*—Healthy, excepting at one point of its surface, where it corresponded to a tumour of the dura mater; here the cerebral substance was depressed, and in part wasted. *Dura Mater.*—Attached to the cerebral aspect of the dura mater, investing the base of the skull (in the right middle fossa, corresponding with the posterior extremity of the petrous portion of the temporal bone), was a tumour, of the size of a walnut, and having all the external characters of the growths previously described. On raising up the dura mater, small points of the tumour were seen penetrating to this aspect of the membrane, and the subjacent bone was found rough and worm-eaten (not carious). *Thorax. Right Lung.*—Weighed 11 oz., somewhat shrunken. The upper, middle, and upper half of the lower lobe, felt as if infiltrated by some hard tuberous deposit of some kind. On cutting into the lung substance, this was found consolidated and grey—in fact, presenting all the appearances that would be expected in old chronic pneumonia. On examining a portion of the lung tissue more closely, I found it studded here and there with what appeared to me to be small deposits of yellow tubercle. With the microscope, after the addition of acetic acid, narrow bundles of intersecting fibres (original lung tissue), exudation corpuscles, indefinite cells, and quantities of fine granules, were the elements noted. *Left Lung.*—Weighed 6½ oz.; exceedingly small, and shrunken to an extreme degree; firmly bound by old pleuritic adhesions; both lobes consolidated, as in the right lung; about an ounce of straw-coloured serum in the pleural cavity. *Bronchial Glands.*—Enlarged. On cutting into one of these enlarged glands, it was found grey and softened, but yielded no juice on pressure. With the microscope, myriads of round, slightly granular corpuscles, less than those of the blood, were seen (lymph corpuscles?). Beneath the *right costal Pleura* of the vertebral extremities of the eighth, ninth, and tenth ribs, and along the sides of the bodies of the corresponding vertebræ, was found a flat

deposit (3 inches long, by 2½ inches broad, and about ¾ thick), of material identical in its physical characters with those of the cranial growths. *Abdomen. Liver.*—Very pale and yellow. *Kidneys.*—Very diseased; extremely hard and tough; apparently consolidated by interstitial fibrinous exudation. *Intestines.*—Very transparent, and distended by flatus.

Minute Anatomy of the Parotid Growth. (1) Large masses of parallel waved fibres, well seen after steeping portions of the growth in chromic acid solution. (2) Elongated narrow nuclei, parallelly arranged, and best seen after the addition of acetic acid. (3) Fibro-plastic cells in fair quantity. (4) Cells about the size of blood corpuscles, round, with a granular nucleus. The basis of the growth was evidently fibrous. No cancer-cells were observed.

The preceding account of the microscopic characters agrees essentially with what was observed independently by Professor Quekett in some portions I brought him to examine.

Mr. Paget had, in 1853, reason to "suspect cases (of myeloid tumours) may be found in which . . . a malignant course is run."* Since the time he wrote this, this suspicion has become a certainty—the occasional malignity of fibro-plastic tumours must now take its rank amongst the best established surgical doctrines. M. Lebert has collected six cases of the kind, the main features of which are given in the following tabular exposition.

* Op. cit., vol. ii, p. 225.

M. Lebert's Cases of Malignant Fibro-Plastic Tumours.*

No. of Case.	Age (when the tumour first appeared).	Locality.	Operation; its date after first appearance of tumour.	Local return of the disease.	Died after last operation, in	Consecutive deposits.
1	16 years and 2 months.	Left epididymis.	Excision; 11 months.	—	One month of marasmus.	Vast tumours in left inguinal and lumbar regions; multiple tumours in peritoneum, diaphragm, and pleuræ.
2	40 years.	Two subsynovial tumours on—1, external condyle of femur; 2, on head of tibia.	Amputation; 3 years.	—	Two months with pulmonary symptoms.	In lungs (?) and surface of liver.
3	79 years (?).	—	—	—	—	Twenty-seven fibro-plastic tumours in the body, viz.: 3 in the meninges, 1 in the left breast, 18 in the pleuræ, 5 in the body of the uterus.
4	34 years.	Popliteal space.	Extirpation; some years after.	1¼ month after extirpation in cicatrix and inguinal glands.	Five months with pulmonary symptoms.	Enormous tumour in popliteal space, inguinal, crural, and lumbar glands; multiple tumours in lungs and pleuræ.
5	29 years.	Middle of right thigh.	First removal (Oct. 1848); 14 months.	Five times in the course of one year; amputation in Jan. 1850; return in stump four months afterwards.	One year and 8 months with pulmonary symptoms.	Vast tumour of mediastinum; tumours in lungs, pleura, inguinal and bronchial glands, and abdomen.
6	24 years.	Bones of feet.	—	—	? with pulmonary symptoms.	Multiple tumours in lungs, pleuræ, bronchial glands and diaphragm.

* Traité d'Anatomie Pathologique, par H. Lebert. Paris: 1855. (p. 194.)

M. Léopold Ollier narrates a case of *Fibro-plastic tumour of the back, accompanied by secondary tumours in the inguinal region, both lungs, and the liver.* The tumour in the back had been removed by the *écrasement linéaire* of M. Chassaignac. M. Delore "found in it only fibro-plastic elements". In the lungs were "little masses of a yellowish white material, pulpy and very soft". In the liver were tumours with "the same outward characters". "In the right inguinal region existed a fluctuating tumour, full of sanguineous serosity and fibrinous deposits". The above description is much more in accordance with that of a case of encephaloid than of fibro-plastic cancer. The figures M. Ollier gives of the microscopic elements, agree more with some of the forms of caudate cancer-cells I have seen, than with those of typical fibro-plastic corpuscles; they are, at any rate, open to doubt, as is indeed the whole case.*

Dr. Follin, in a recent letter, writes me, that "since that time (viz., the publication of Lebert's cases), we have had on more than one occasion the opportunity of observing analogous facts in the Paris hospitals."

The following case, from my essay *On the Diagnosis of Surgical Cancer*, is intermediate in its characters between fibrous and fibro-plastic cancer.

Case. An old man, aged 65 years, of a muscular frame and florid complexion, had a very large tumour at the lower end of his left thigh. It was about the size of a walnut when he first observed it some two years before; but had since progressively increased to its present size. There were no inguinal enlargements. He had suffered occasional "scalding" pains in the part. There was no

* Recherches Anatomo-Pathologiques sur la Structure intime des Tumeurs Cancéreuses aux diverses périodes de leur Développement, par Léopold Ollier. Montpellier: 1856. (page 88.)

cancerous predisposition to be traced; but some of his brothers and a sister had died of phthisis. This man died from the effects of chloroform, administered for the purpose of amputation of the thigh. At the *post mortem*, a tumour was noticed on the left arm, which, somehow, had escaped notice during life, one in the substance of the liver, and some deposits in the lungs. A section of the tumour of the thigh presented all the naked eye characters of a *fibrous* tumour (*propr. sic dict.*), just as is observed in ordinary fibrous tumours of the uterus. At one spot, however, a considerable hæmorrhagic effusion had occurred into the substance of the growth. The microscopic characters of the tumour were equally distinctive. Large quantities of fibres, for the most part parallelly arranged, constituted the main element. Some few fibro-plastic cells, here and there an elongated nucleus (brought out by acetic acid, which effaced the fibres), and a number of fatty molecules, were the secondary elements. Not a single cancer cell could be seen. The tumour from the arm was about the size of an olive, and its section was characterised by numerous pearly fibres concentrically arranged. It had under the microscope an indistinctly fibrous structure, but acetic acid developed quantities of round and elongated nuclei, the latter with their long axes in the same direction. In a word, it was a most typical specimen of a *fibrous* tumour. The growth in the liver, on the other hand, differed from the two preceding ones, in having the properties, not of a fibrous, but of a *fibro-plastic* growth. It was about the size of a filbert, cut hard with a section of a uniform dead white, with points of translucency here and there, and devoid of any sanguineous staining. A mass of fibres was seen in the field of the microscope, and after the addition of acetic acid, a number of nuclei, some spheroidal, some fusiform and narrow. In the lungs were

some irregular deposits resembling exudation-matter, consisting of a great many fibres, mostly of an elastic nature, and what appeared to be a few oat-shaped nuclei.

(11) Epithelial Cancer. (Paget, Schuh.) Epithelial growths agree with the general characters of cancer in three particulars:—

1. Their infiltrating character, irrespective and destructive of the natural tissues met with in their progressive evolution.

2. Their tendency to the production of the same disease in the adjacent lymphatic glands.

3. Their tendency to recurrence after surgical operations.

Now, if of these three cancerous attributes it could be proved, that the two latter are dependent on, and mere consequences of, the first, a great step would be made in the surgery of the disease. That epithelial cancer of the tongue and lips should so constantly recur after operations, need not surprise us; indeed, any one who has dissected these tumours, and observed how marked their infiltrating nature is, would feel more surprised if they did *not* return. If, on the other hand, it can be shown that epithelial cancers of the extremities do not return when amputation is performed early (and before any trace of glandular swelling has manifested itself) above the next joint, it becomes a question, whether complete removal of the tongue and lips, although an operation of extreme severity, would not be more in accordance with the principles of surgery than any partial operation on those organs?

Case. *Epithelial Cancer of the Foot; Amputation at the Ankle-Joint; no return of the Disease three years after the Operation.* Mary B. was 71 years of age when she was admitted into the University College Hospital for a malignant ulceration of the foot. She had hitherto always enjoyed good health: no cancer was to be traced in her parents. Many years ago she had a corn about the size f a florin, near the little toe; this she had been in the habit of soaking and cutting from time to time, when, from its size, it prevented her walking. Last January, in going up stairs, she struck her corn, and felt severe pain in it. From that time forwards it had gradually been getting into its present condition. On the outer side of the anterior half of the left foot was a malignant looking ulcer, which extended an inch and a half back on the dorsum, and three inches into the sole of the foot, and rose about half an inch above the general level of the adjacent sound skin. The surface of the ulcer was very rugged from prominent shreds of concreted discharge; and where this was absent, pale red warty excrescences came into view. The margin of the ulcers was thick and rounded. The skin around had a slight blush, but felt natural. With the exception of the little toe (which was involved in the ulceration in its posterior half), the toes of the foot were sound. The discharge had a fœtid smell; she compared this at times to that "of a water-closet". It had bled several times. During the day she suffered comparatively little pain, of a "gnawing" character; but at night a most intense pain was superadded, which she described as of "a plunging nature, as if a bundle of forks were driven into the part".

She was, considering her age and sufferings, a remarkably healthy looking old woman, with a tolerable amount of flesh on her extremities, her mental faculties most perfect, her spirits excellent. Two days after she had been in the hospital, Mr. Marshall removed the foot at the ankle-joint.

Anatomy of the Growth. Its most marked character was that, by gently insinuating the handle of a scalpel, the growth could be split up into several portions: a section

through its substance shewed this to depend on the columnar structure it possessed, allowing its separation into papilliform shreds. Some portions, however, consisted of a mere granular pulp of broken up structures. The general colour of the section was dead white, but the individual papillæ had a degree of opalescence. Portions of these were examined microscopically, and then found to consist of epithelium scales, similar to those of healthy cuticle; but in some fields of view multitudes of nuclei were alone seen, the outlines of the epithelium cells being concealed, when in several layers.

After a prolonged stay in the hospital, several abscesses and sinuses having formed in the course of the healing of the operation-wound, she ultimately made an excellent recovery.

August 14th, 1856. The stump continues perfectly sound, being constituted by a firm thick pad of flesh: about an inch above this there is in front a very narrow firm cicatrix. She feels "throbbing" pains in the stump, similar to those she felt formerly in the corn, before the weather changes. She walks once a week to St. Pancras Workhouse and back with the aid of a stick. She told me she was seventy-four years of age the 16th of last March, and enjoys excellent health.

Here we have a case of, what the German pathologists would call, the most "exquisite" epithelial cancer, which has not returned three years after amputation.

The only objection that arises is, How are we to explain away those cases, where, after removal of the primary disease, the disease returns not in its original situation, but after perhaps a considerable lapse of time in the adjacent lymphatic glands?

Yet we have two important points in support of the non-constitutional nature of the disease. 1. That these growths appear to kill by their purely local effects: involvement of vital organs, pain, discharges, and hæmorrhages. I do not remember ever having seen a cachectic state produced independent of such effects. 2. That it is extremely rare to find secondary deposits in the viscera in *post mortem* examinations of cases of epithelial cancer, of however long duration.*

* Velpeau has seen epithelial cancer of the lip recur in the thickness of the lower jaw, in the upper jaw, and in the liver; Paget, in the lungs, in the liver, and in the heart; Rokitansky, in the liver.

PART II.

THE HEREDITARY (?) NATURE OF CANCER.

MR. PAGET states that, "in 160 cancerous patients, there were 26, or very nearly one-sixth, who were aware of cancer in other members of their families."* M. Lebert, that "he sought with much care for hereditary predisposition in 102 cases, and found it in 14 of these patients."† In 54 cases which I have observed myself, and in which I have specially noted the point, I find 6 cases of an apparent hereditary predisposition. [1. Scirrhus of the breast: a cousin died of the same disease. 2. Scirrhus of the breast: the mother died of the same disease. 3. Osteoid cancer of the femur: a grandmother and a sister died of cancer of the breast. 4. Scirrhus of the breast: a maternal aunt died of cancer of the liver. 5. Epithelial cancer of the malar bone: the mother died of scirrhus of the breast. 6. Scirrhus of the breast: the mother died of the same disease.]

Summing up these cases, we have, in 316 cases, 46 cases of apparent inherited tendency to cancerous disease, about one-seventh of the total number of cases, or about 14.5 per cent. This proportion is too small to establish the hereditary nature of cancer; but even this statement must be taken *cum grano salis;* for a reason which Louis advances in his *Recherches sur la Phthisie*, viz., that the bare statement of a patient, that one of his relations died of cancer,

* Op. cit., vol. ii, p. 538.
† Lebert's "Maladies Cancéreuses", p. 134.

is not sufficient evidence to the pathologist that such was really the case; he must endeavour to elicit the main features of the disease, and then judge for himself, whether the patient's statement and his own opinion are in sufficient unison to warrant a positive conclusion. Louis, in this way, found, even in the case of phthisis, that, "of 31 phthisical patients, only 3 sprang from parents who were obviously phthisical, 12 from parents who were not phthisical, and 16 from parents the nature of whose disease could not be determined with precision." Now, if Louis considered such precautions necessary to elicit the hereditary character of phthisis, *à fortiori* should they be observed in a disease the hereditary predisposition to which is yet *sub judice*. We may very well conclude that all the above numbers in the case of cancer are, in this point of view, open to objections. I have hence attempted to solve the problem by a totally different method.

Let us assume, in the first instance, that phthisis may be safely taken to be the type of a hereditary disease, then, from the fact that phthisis and cancer are both *fatal* diseases, we have the means of instituting the following comparisons, which are best exhibited in a tabular form.

Comparative Mortality of Cancer and Phthisis in London in the Years 1845-1850.

	Deaths from Cancer from the age of 25 to 80.		*Deaths from Phthisis from the age of 5 to 65.*	
Year.	Males.	Females.	Males.	Fem.
1845	160	519	3233	2762
1846	174	626	3441	2862
1847	177	574	3497	2923
		(from ages of 20-80.)		
1848	204	640	3266	2739
		(from ages of 20-80.)		
1849	195	645	3045	2740
1850	208	656	3049	2683
Sum	1118	3660	19531	16709
	Total 4778		Total 36240	

Hence the average annual mortality in London from cancer in both sexes, from the age of 25 to 80, and from phthisis from the age of 5 to 65, is respectively 796·5 and 6040; and the ratio of the average mortality of cancer to phthisis is 1-7·5.* Now, I contend that, if cancer is less than one-seventh as fatal as phthisis,† this fact alone is sufficient to render it highly probable that *cancer, as a rule, is not a hereditary disease.*

Any objections to this conclusion, founded on the disparity of frequency of the two diseases, are met by the probability that, if cancer, *ab origine*, was a much rarer disease than phthisis, but that both propagated themselves by hereditary transmission, after the lapse of so many centuries, their numerical ratios would by this time have equalised themselves to a greater degree, than is the fact.

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* The deaths in London have been taken as the basis of calculation, because from the large proportion of deaths that occur in public institutions the diagnoses can be better relied on. Deaths from "phthisis" before the age of five have been excluded on account of the doubtful nature of the diagnosis. It is satisfactory, however, to find that deaths at all ages from the two diseases being taken as the data, nearly the same result is arrived at, viz., 1-7·9.

† It is not unworthy of remark, that this ratio is also nearly that which the number of hereditary cases of cancer bears to the total number of cases of cancer, in which this particular has been inquired into.

PART III.

THE RELATION OF CANCER TO TUBERCLE.

Hannover states that, in 338 *post mortem* examinations in the Friedrich's Hospital in Copenhagen, cancer was found combined with tubercle only three times. In 104 necropsies of cancer, Walshe observed only seven instances of tubercle. Paget gives a well marked case. Lebert relates an interesting illustration. A woman, aged 62 years, died with all the symptoms of advanced phthisis. At the autopsy, crude and softened tubercles and vomicæ were found in the apices of the lungs; the peritoneum contained many partly cancerous, partly tuberculous infiltrations. The liver also contained cancerous masses, mingled with deposits of tubercle. Dr. Carl Martius of Erlangen has accurately recorded twelve necropsies of tuberculosis of the lungs, combined with cancer in other organs of the body.* Up to the time of publication of my Essay on Cancer, I had observed two cases of the coexistence of cancer and tubercle; neither of these cases were, however, very satisfactory ones; one was carcinoma of the right auricle of the heart—a dissection-room case; the second a case of colloid (on the nature of which disease opinions are still divided) of the peritoneum. In both of these genuine crude tubercles were found in the lungs. But I am now able to produce a very conclusive case at point.

* Die Combinationsverhältnisse des Krebses und der Tuberculose, von Dr. Carl Martius. Erlangen: 1853.

Case. Obid O., aged 77, consulted me in September 1854, for a swelling of his right cheek, that had existed about four months before I saw him. The right malar region was considerably swollen, felt doughy, was dingy red and glossy; it was very tender, and he experienced remitting pains in the part, of a pricking and shooting character. He had five decayed teeth in front of the upper jaw, and had lost all his other teeth long before. The vision of the right eye was unimpaired. In his right nostril was an ordinary mucous polypus, which had existed for some years; this I removed. He knew not how to account for his malady. None of his relations ever had cancer, but there appeared to be a tuberculous tendency in the family. He had lost flesh; his appetite had forsaken him; his complexion was dull and earthy.

The further progress of the case may be told in a few words. The tumour increased, but never reached any considerable size, nor gave him much pain. The right eye was attacked by a chronic inflammation, and was slightly protruded; and he at last became nearly blind of this eye. He lost his sense of taste; "everything tasted alike to him". The nostril bled occasionally, often to a degree sufficient to require medical attention. His sense of smell, too, became impaired. But it was in his general health that the most marked changes occurred. He wasted to a "living skeleton", sinking with it to a degree of debility not often witnessed. He died the latter end of February 1855, about eight months from the first commencement of his disease.

Post Mortem Examination. *Brain.*—Normal. *Antrum.*—Filled with a growth which reached to the very bottom of that cavity, and had completely destroyed its anterior wall and the floor of the orbit. The tumour was of the medullary species; the cut surface was firm, yellowish white, not hæmorrhagic. On pressing it, a good deal of thick, white, turbid juice, exuded in small drops. I found this growth composed exclusively of cancer-cells—without exception, the most perfect specimens I have ever seen. Some were circular; others lengthened out; others again of an extreme length, and narrowed. A great many contained two or more, often a large number, of nucleolated nuclei—excellent examples of endogenous cell-formation. Exudation corpuscles and fat globules were also abundant. *Lungs.*—Upper halves of both firmly consolidated by quantities of crude yellowish grey tubercles. A few small vomicæ. No cancerous deposits. The microscopic characters of the tuberculous matter were well marked. *Heart.*—Some indurations at the edge of the mitral valve, and in the line of attachment of one of the segments of the aortic valve. Bicuspid and pulmonary valves normal. No hypertrophy nor dilatation; muscular substance firm. *Liver.*—Portal system congested. Contained a small earthy nodule. *Kidneys.*—Left one of a deep venous hue, with a small cyst in its substance. Right one healthy. *Spleen.*—Normal. *Intestines.*—Not opened; much narrowed in calibre.

Another fact worthy of attention is the different susceptibilities different organs have for the development of the two morbid states. Thus primitive cancer of the lungs is very rare, primitive tuberculosis of the lungs very common; primitive cancer of the liver is not uncommon, primitive tuberculosis of the liver is rare. And these facts may be multiplied for several other organs.

I have long been struck, when listening to the melancholy tales of cancerous patients, how often one hears that some of their relatives have died of consumption. Is there any connexion between the two diseases? Are they in any way, as it were, *vicarious* to one another? If they were, the great rarity of their both occurring *together* would be at

once explained. However, the materials for answering these questions are as yet too scanty and vague to allow of any positive conclusions. All I will say is, that, of 51 cancerous patients who have fallen under my own observation, I find that no fewer than 14 (upwards of a fourth) knew of a parent, a brother, or a sister, having died of phthisis.

PART IV.

ON THE RELATION OF THE SECONDARY TO THE PRIMARY DEPOSITS OF CANCER.

THE words "primary" and "secondary" are, in the doctrine of cancer, used in the same sense as in the science of geology, to indicate merely a question of *time*—that one tumour was deposited before the other—without reference to any further relationship they may bear to each other. This is necessary to observe, inasmuch as the predominating idea in the words "primary" and "secondary" would, in the language of the day, appear to be one rather of rank and importance than of simple ordinality. Perhaps the least objectionable designations would be "original" and "consecutive" deposits—terms in which the relations of time overbalance those of comparative rank.

Given an original deposit of cancerous material, the *loci* of the consecutive deposits may be, either singly or conjoined—

(1) The lymphatic glands;

(2) The vital organs (the viscera);

(3) The organs of external relation (organs of locomotion and special sense).

No set of organs is so constantly the seat of consecutive infiltrations as the *lymphatic glands*. Most authors, whilst admitting the great practical significance of this fact, have

underrated its pathological distinctiveness by referring to other specific diseases (as syphilis) and non-specific inflammations, of which engorgement of the adjacent lymphatic glands is a concomitant. We are, however, of the opinion that this symptom is in a degree quite peculiar to cancerous disease.* Upon what other supposition can the well known fact be explained, that, after the removal of a cancerous tumour, *with an often prolonged interval of apparent cure*, the adjacent lymphatic glands may become affected without any local recurrence of the original tumour? Why, in those cases in which it is more reasonable to refer the glandular swelling to infection from the original tumour, the lymphatic rather than the vascular system should be the channel of infection, is a question as difficult of solution as the fact is easy of observation. The analogies of poisons in their preference to vascular or lymphatic absorption is the nearest approach to explanation we can offer. But that the cancerous virus may also be conveyed by the circulating blood to remote organs, two excellent examples will at once demonstrate. The one is a case of Professor Wernher's of Giessen, to whose politeness I am indebted for some excellent original drawings of the preparations. A man had his thigh amputated for fungus hæmatodes of the upper third of the left tibia. He died seventeen days after the operation, with symptoms of gangrene of the lungs. After death, gangrenous abscesses were seen in the lungs. These were found to depend on occlusion of the pulmonary arteries by cords of cancer; whilst in the blood of the vena cava ascendens Professor Vogel detected the microscopic elements of cancer.† The

* The tuberculous deposits of lymphatic glands cannot be regarded as "consecutive" deposits.

† Vide "Ein Fall von Krebs der Lungenarterie, von Dr. A. Wernher", in Henle u. Pfeufer's Zeitschrift, N. F. Bd. v, 2. Heft. pag. 109.

next case alluded to is that of Professor Paget. (*Vide* p. 21.)

But our statistics on the consecutive infection of the vascular system in cases of malignant disease remain to be made; for in how many *post mortems* (conducted as they generally are after a fixed routine) are the blood and its channels, notwithstanding their exalted physiological and pathological position, ever examined? Proceeding, however, from the scanty materials we possess, one's attention is arrested by the following facts.

For the lungs to be consecutively infected in cancer of the testis, is comparatively rare; but, out of 8 cases which I have collected, in no less than 5 cases (upwards of one-half) the vascular system is stated to have been simultaneously infected. In 5 instances of vascular infection in 14 cases of osteoid cancer, in all the lungs were so also.* In a single instance out of 16 cases of cancer of the liver in which the lungs were affected, in that very case was the vascular system. It must be remembered, too, that it is most probable that in many cases the affection of the vascular system was overlooked; but that deposits in the lungs were so, is improbable.

These facts, coupled with those of direct observation (as in Professor Wernher and Paget's cases), would seem to indicate that, *wherever the lungs become the nidus of consecutive cancerous deposits, they do so through the medium of the vascular system.* This view is in a degree supported by the facts observed in another disease—pyæmia. The purulent deposits of pyæmia may not inaptly be compared to those of cancer and tubercle, the differences in the three

* The cases of osteoid cancer possess a special value in discussing the relation of the lung to the vascular infection—1, because, being a rare disease, the *post mortems* have been made carefully; 2, because any infection of the vascular system is rendered the more obvious by the nature of the deposit.

diseases depending on the different times the different processes expend in their consummation. I do not stand alone in seeking to establish these analogies. The same idea has struck many other authors. Of these I may cite Cruveilhier. He calls attention to the fact that the lungs and liver are the organs prone to secondary abscesses and secondary cancers; that, the same as multiple abscesses of the liver are the consequence of phlebitis, so does cancer affect a sort of predilection for the surface of the organs.*

The connexion between phlebitis and pyæmia is admitted: a similar connexion between cancer of the blood and cancer of the lungs is rendered probable by the foregoing considerations, but still remains to be proved.

The frequency with which the *viscera* are consecutively affected in cases of malignant disease may be compared with that of affections of the lymphatic system, and will be found to hold the second numerical rank. The general statement is, that the lungs and liver are the organs most often consecutively affected. This crude statement is true, but affords little information either to the pathologist or to the surgeon. In discussing this point, I have been obliged to glean my materials from the most various sources, and regret to say that I have been compelled to dismiss from consideration two most important organs—the breast and uterus. The records of complete cases of cancer of these organs are rare, because the cases are common. Let us, however, see what results emanate from the consideration of some other classes of cases. Repetition will be avoided, and the subject made the clearer, by exhibiting these results in a tabular form.

* Cruveilhier's "Anatomie Pathologique du Corps Humain". Paris: 1829-35.

Primary Deposit.	Cases.	Secondary Deposits in the—					
		Lymphatic glands.	Lungs.	Liver.	Vascular system.	Brain.	Stomach.
I. Malignant disease of the testis	36	30	8	9	10	—	—
II. Encephaloid of the femur or tibia	9	1	3	3	1	—	—
III. Malignant disease of the soft parts of lower extremities	10	6	7	2	1	—	—
IV. Osteoid cancer of the lower extremities (one of the upper extremity)	14	7	9	0	5	—	—
V. Encephaloid of the eyeball or orbit	14	8	—	—	—	11	—
VI. Cancer of the liver....	16	5 abdl.	1	*	1	—	8

From the above numerical data, we may deduce the following conclusion—that *special original deposits are succeeded by special consecutive deposits.* For example, in 13 cases of osteoid cancer of the lower extremity, in no less than 9 were the lungs affected; while, on the contrary, in 16 cases of cancer of the liver, in only 1 were the lungs affected. In 32 cases of malignant disease of the lower extremities, in 14 were the lymphatic glands affected; whilst, in 36 cases of the affection of the testicle, in no less than 30 were the glands contaminated. There is reason to suppose that, with our advancing knowledge of the pathology of cancer, we may be able to deduce further conclusions on this interesting point. As yet, the one announced appears to be the only one fairly deducible from the data referred to.

PART V.

ON THE NATURE OF CANCEROUS DISEASE.

We come now, finally, to the question of the *Nature of Cancerous Disease.* The most interesting, the most important question that here arises is, Is cancer a local, or is it a constitutional disease?

Let us, *in limine,* ask ourselves what we mean by a "constitutional" disease? It is a disease for which an individual has acquired a special aptitude, which subsequently, under the influence of an exciting (often perhaps unknown) cause, ends in the development of the actual disease itself, for the reception of which that aptitude was in the first instance an essential preparatory element. To take an every day illustration of such a constitutional aptitude: a child is scrofulous; he may grow up to manhood without any notable ailment; he then happens accidentally to sprain the ankle-joint; a specific tuberculous inflammation is lighted up; the cartilages ulcerate; the bones become carious; the whole joint disorganises. This leads perhaps to amputation, perhaps to the grave. A second child of sound constitution meets with the same accident at the same age. A non-specific inflammation of the joint ensues; this subsides, and a slight weakness in the joint is the only vestige of his former accident. In the first case, a special impression is made upon the morbid action by a special constitutional crasis; in the second, no such crasis existing, no special consequences result.

A sufficiently broad line of demarcation has not been drawn between *blood* and *constitutional* diseases. What phrase is perhaps more in the mouth of every surgeon than "constitutional syphilis"?* Syphilis is a disease of the blood, but certainly no more a constitutional disease than typhus fever. Both are diseases due to the introduction of a morbid poison into the circulation. The one is a chronic, the other an acute disease. Both have their determinate series of symptoms, but we have yet to learn that either possesses, like the tuberculous constitution, the power of impressing on other pathological processes a special character (excluding, of course, from consideration the impressions pathological processes may derive from a general dyscratic state of the system).

The following are some of the facts in favour of the constitutional nature of cancerous disease.

(1) Cases of cancer are now and then met with which follow a most acute course, the tumours succeeding one another with a rapidity only explicable by a constitutional tendency to their production.

CASE. *Acute Cancer: Multiple Tumours: Death.* A dark complexioned young girl, 16 years of age, noticed a pimple on the palm of her hand, opposite the root of the little finger. It went on getting larger, till it reached the size of a small nut; and, a week afterwards, a second tumour formed on the inner side of the arm. She then entered the Middlesex Hospital, where a third tumour made its appearance in the axilla, and a fourth on the palmar aspect of the forearm, just above the wrist. Mr.

* If it be admissible at all, it should be limited to the case of infantile syphilis.

Moore made an exploratory incision into the tumour of the palm, which then degenerated into a foul ulcer, with angry edges. It was at this stage of the case that I first saw the girl. The ulcerated part of the tumour looked towards the palm, and extended from about the root of the little finger nearly to the wrist-joint. On the dorsum of the hand, the tumour was covered by the skin, red and glossy from tension. The fifth metacarpal bone felt sound. She had suffered pains in the tumour, "like knives cutting in and out", but was sometimes comparatively free from pain. Her general health had never been good; she often experienced pains in the chest and right flank; her bowels were never regular; she was troubled with vomiting and sick headaches. She had never menstruated, nor felt any catamenial sensations at the monthly periods. After she left the hospital, a fifth tumour formed in front of the arm, two or three small ones below the bend of the elbow, several hard tumours the size of a bean under the skin of the mammary region, one on the forehead, one under the skin of the eyelid. All these tumours I saw myself, but I believe she had several others. During this period, she fell into a deep cachexia, and emaciated rapidly; before her death, she had cough, with bloody expectoration. Unfortunately, she came into the hands of a cancer-quack, otherwise I should have been enabled to have given a more complete account of this interesting case.

(2) In those distressing cases of highly vascular encephaloid growths, to which Hey applied his designation of fungus hæmatodes, especially as they occur in the limbs of young subjects, notwithstanding the most complete of all surgical removals—that of amputation above the proximal joint—the disease is almost inevitably certain to recur, *often after an interval of apparent cure.* I have seen several instances of this fact.

(3) It is by no means uncommon for scirrhus of the breast to recur *months or years after an operation*, not in the cicatrix of the operation wound, but in the neighbouring lymphatic glands.

(4) CASE. A woman had her breast amputated for an ordinary scirrhus. It was a hard, firm growth, cut with a clean section, which was of a translucent bluish colour, traversed by threads of an opaque buff (milk ducts). Some highly characteristic cancer-cells were observed in the growth. The operation had hardly been done four or five days before the disease returned in the skin above the operation wound. The secondary formation was removed; it was a grey, semi-transparent, gelatinous, highly vascular and hæmorrhagic substance—in a word, *encephaloid*. The microscopic characters were those usually seen. She was discharged, with the operation wound cicatrised, in about three weeks after the last operation.

Such a case as this affords strong evidence of the constitutional origin of cancerous deposits. The secondary growth was of a totally different species of cancer to the primary one: hence the former was not a portion of the latter left by an incomplete operation, but would appear to have been called into existence by the irritation of the operation wound reacting upon a strong constitutional predisposition to malignant disease.

(5) The exciting cause of a cancerous tumour is often inappreciable: in the great proportion of cases, inadequate to account for its appearance. In this latter respect, cancerous disease bears a strong analogy to pyæmia. It is not improbable that this latter disease (and even possibly tetanus) may demand a prior special alteration of the general constitution for its actual production.

Turning to the evidence for the local nature of cancerous

disease, we are at a loss to determine upon what facts such evidence rests.

(1) That cancerous tumours not uncommonly succeed some local injury? *Post hoc, propter hoc.* Admitting such an interpretation of the facts of the case, hardly an individual of the human race would be exempt from the fatal malady.

(2) Some authors have held that the secondary deposits of cancer originated in the first instance from the blood that had become infected by absorbing the cancer-blastema of the primary tumour. The doubtful, if not negative, results obtained in the attempts to inoculate cancer controvert this opinion. Several months ago, Dr. Harley and myself instituted experiments on this subject; and, as we intend publishing our results at a future period, I for the present refrain from saying anything more on the subject, than that the possibility of inducing cancer by inoculation is far from proved.

We are, in a word, firmly convinced that *cancer is a constitutional disease:* that a cancerous tumour may react secondarily upon the system at large, by infecting the blood with cancer-blastema, and so in a limited sense be itself a *local* evil, we are not prepared to deny. Indeed, under certain exceptional circumstances, there is every reason to believe that the cancerous diathesis may exhaust itself (die out) in the production of a single tumour; and this secondary source of contamination being removed by a surgical operation, the patient may be permanently cured.

RICHARDS, 37, GREAT QUEEN STREET.

A REPORT

ON THE

PROGRESS OF IMPROVEMENT IN THE TREATMENT

OF

CONSUMPTION

AND OTHER

PULMONARY AND LARYNGEAL DISEASES,

AND ON SOME

NEW REMEDIAL MEANS.

BY

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PREFACE.

THIS Report formed a series of papers, originally drawn up for the purpose of being read to the Liverpool Medical Society, at two meetings of which the views it contains were very fully discussed. The treatment of Consumption and allied Pulmonary Diseases is a subject which has for several years received much of the author's attention; and he has had considerable opportunities of investigating it, having in the Royal Infirmary three wards under his charge, in one of which he has been in the habit of placing together his cases of Pulmonary Disease, for the purpose of observing more closely, and comparing the effects of treatment in a variety of cases of the same class.

MORNINGTON TERRACE, LIVERPOOL,
May, 1853.

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A REPORT,

&c.

It is now more than three years since I laid before this Society and the profession, An Inquiry into the Curability of Consumption, with Observations on the Treatment, and the use more particularly of cod liver oil, a remedy, the true value of which was not at that time as fully appreciated as it now is, and respecting which considerable difference of opinion prevailed. I need scarcely observe that, at that period, medical men were but little disposed to receive favourably, any facts tending to prove the possibility of recovery from consumption, even in its early stage; their views of the treatment being limited almost exclusively to the palliating of the cough and other urgent symptoms, but without any definite hope of materially retarding the advance of the disease. The treatment of consumption, and the nature and causes of tubercular and scrofulous diseases, are subjects which have, since then, received a large share of the attention of medical men,—a fact which is evinced by the publication of several works, and of many papers and lectures in the medical periodicals. And, I may venture to assert that, while those members of the profession, whose opportunities of examining the subject give to their opinions the best claim upon our respect, now fully admit the possibility of recovery in the earlier stages, it has become with all, an additional object to suspend or arrest the progress of the disease.

The introduction, therefore, of a new object to be attained in the treatment, viz., the arrest or suspension of the disease, which can scarcely be said to be in any case quite beyond the range of possibility till the means in the hands of the profession have been fully and perseveringly tried, is itself a strong proof of progressive improvement. But, besides this, our advance towards a more successful treatment of the disease is proved by numerous carefully observed cases, which have shown that this subject is by no means so unfruitful as to be incapable of yielding some return for patient investigation; and I feel assured that any facts I have to lay before you respecting new remedies, will receive favourable consideration, and an unprejudiced examination from the profession.

My objects in this report are, to add a few facts to those I have already published, with reference to the degree of permanence of recovery in those cases of consumption where the disease has been arrested, and to bring forward some further researches respecting the treatment of this disease, as well as asthma, and some affections of the air passages.

In the Inquiry I read to the society, in 1850, I directed attention to two subjects more particularly, viz.,—the curability of the disease viewed as an abstract question, independent of any particular method of treatment, and the value of cod liver oil as a remedial agent. I shall not re-open the first of these further than to add two illustrations which appear sufficiently interesting to be worthy of notice here. The second is a subject respecting which much new matter has been accumulated, and it will therefore call for a more extended review.

The first *case* in illustration of the previous point, is a very remarkable one, showing that, after all the usual symptoms of consumption had manifested themselves to such an extent that recovery was considered hopeless, the disease was, nevertheless, arrested spontaneously, and has continued suspended for fifteen years, though a large cavity still exists in the left lung.

A gentleman called upon me on the 31st of December, 1850, by the direction of a Life Assurance Company, to be examined with reference to the eligibility of his life. I was surprised to find that, though he appeared to enjoy pretty good health, he had a very large cavity in the left lung. He was then thirty-two years of age, and I ascertained that at the age of nineteen he had been very ill, with all the worst symptoms, and that two eminent medical men had considered his case quite hopeless. He gradually, however, im-

proved in his health, and was able to enter into business; and when I examined him, he was in the habit of taking much exercise in the open air, and was actively engaged in commercial pursuits. His breath was habitually rather short when he exerted himself much; he had never been quite free from morning cough and slight expectoration; and on four or five occasions, since his illness, he had spat blood. The nails were much enlarged, but he had no night perspirations or other sign of active disease, and the pulse was only 80. There was very decided dulness on percussion, and flattening of the left side of the chest. In the mammary region respiration was amphoric, and the voice pectoriloguous. Posteriorly, at the lower part of the chest, there were some dry creaking sounds. It was evident that in this case a large cavity had formed, and still existed, and it must have become lined by a fibrous, or fibro-cartilaginous membrane, the disease being thus suspended by an effort of nature; and such a case gives us the best encouragement to persevere in our efforts to accomplish a similar object.

The second *case* was one in which cretaceous tubercles were found along with a puckered cicatrix, which must have resulted from the healing of a cavity. The patient was a gentleman about fifty years of age, who died suddenly of another disease, aneurism of the aorta, and I had an opportunity, along with Dr. Ramsay and Mr. Fletcher, of making an examination. In the upper part of the left lung there was a portion very much puckered, in and around which five or six cretaceous tubercles were found. One of the tubercles was surrounded by a thick capsule or cyst, and another cyst was opened which contained only a thin yellow fluid. On cutting into the most depressed and puckered part, a radiating appearance, caused by fibrous bands concentrating towards a point, was found, and there could be no doubt that this star-like cicatrix had resulted from the contraction and obliteration of a cavity, seeing that cretaceous tubercles containing crystals of chlolesterine existed in the surrounding tissue. I have no history of the case further than that the individual had lived many years in the West Indies, and had latterly suffered from symptoms of heart disease. There can however be little doubt that, at some period, probably early in life, active disease of the lung existed, but that the constitutional powers gained the ascendency; the cavity contracted, and at last completely healed, while those tubercles, not eliminated or absorbed, underwent transformation, and ceased to cause further irritation.

I have formerly shown the possibility of recovery from consumption, taking place in three ways: first, by the shriveling and obsolesence of miliary tubercles: secondly, by the cretaceous transformation: thirdly, by the healing of cavities. I have also expressed the opinion, formed from observation, of changes in the physical signs under successful treatment, that more or less complete absorption of tubercle occasionally takes place. This opinion, I am glad to find strengthened by that of Ancell, and by the opinion of Dr. Cotton, one of the physicians to the Brompton hospital for consumption, who, in the work he has recently published, observes—"The possibility of tubercle becoming absorbed, has been much questioned; but I have witnessed so many instances in which the recovery was complete, and all evidence of pulmonary disease was entirely dissipated, after every general and physical symptom of tubercular deposition had been most unmistakeably manifested, that I cannot for a moment doubt its occasional occurrence—less often it is true than we could desire, but still sufficiently frequent to encourage hope, and to lead to a steady perseverance in those measures which are likely to promote it." I may also remark that, in making post mortem examinations, I have had opportunities of observing dryness and shriveling of the tubercular deposit, with increase of the black pulmonary matter, in cases where consumption had been long arrested by means of cod liver oil and other treatment. *The possibility of recovery* in these ways, is now, therefore, *no longer a matter of doubt;* but, it is equally certain that, the further the disease has advanced, the less is the probability of any of these favourable changes occurring; and, as regards the healing of cavities, I feel convinced that this is a rare occurrence, and that we cannot always regard the disappearance of the physical signs of a cavity which had once been proved to be present, as certain evidence of its obliteration.

I have always been desirous of tracing how nature brings about spontaneous recovery, and I may quote the following extract bearing on this point, from the introductory address I delivered at the opening of the Liverpool Royal Infirmary Medical School (Session, October, 1852). "We have reason to expect that improvements will continue to be made in practical medicine by observing closely how nature unaided effects the cure of some diseases. 'It is the character of the true philosopher to hope all things not impossible, and to believe all things not unreasonable,' (Herschell)—and we should seek to follow wherever we are able to trace her footsteps. The cure of aneurism by ligature of the artery, and the still more advanced method of treatment by compression, are based upon the process by which nature has in some instances effected the removal of the disease without any assistance from art. Close observation of her operations has also incontestably proved that she succeeds in no inconsiderable number of cases of consumption in arresting, and even in some instances, in effecting perfect recovery in a disease which had long been set aside as utterly beyond the reach of medical treatment." In this point of view the case of the gentleman who presented himself for life assurance is particularly interesting, being one where the same partial recovery or suspension of the disease has occurred, which improved means of treatment enable us to effect in no inconsiderable number of those cases where cavities have formed. The long duration of spontaneous suspension in that case, is also an encouraging circumstance, as it gives us reason to hope that, in cases where suspension has been effected by medical treatment, in similar circumstances a like degree of permanence may be not unreasonably looked for. It is hoped that the following facts will tend to elucidate in some degree this important practical subject.

HOW FAR IS RECOVERY PERMANENT WHERE CONSUMPTION IS ARRESTED?

This is a subject of momentous interest to those who have tubercular affections of the lungs. We are frequently pressed hard by patients and their friends to give a decided opinion upon it, and we often find it very difficult to reply in precise terms, for as yet it cannot be said that the opinion of the profession has been embodied into any general proposition expressing a complete answer to the question. I believe, however, that some of the most definite facts illustrating it are those published by Dr. Quain, in the *Lancet*, as cases of arrested pulmonary phthisis.

The degree of permanence of recovery is a matter which must be influenced by many circumstances, such as the greater or less degree of constitutional tendency to the tubercular disease, the rapidity or slowness of its progress, the care which the patient himself may take in efficiently and perseveringly carrying out the proper means of treatment, his position in life, and the power he may thereby possess of guarding against, or of removing himself from, the operation of injurious influences, which tend to reproduce the disease; but, above all, by the stage of the disease and the extent of its progress. I shall not on this occasion enter into the consideration of these subjects, which are, however, of great practical importance and interest; but as each medical man who carefully observes and records the cases which come under his notice, may contribute some facts towards the elucidation of the subject, and, as a very considerable number of cases of pulmonary disease have come under my observation and treatment during the last four years, in private as well as hospital practice, I offer the following selection of cases, which gives a fair representation of the actual results of treatment in this disease, with reference to the point under consideration.

Case 1.—I was consulted, in the beginning of December, 1849, in the case of a delicate youth, thirteen years of age, of pale complexion, and the son of a gentleman of very scrofulous constitution, who had lost several relatives from consumption. He had been confined to the house more than a month with cough, which had alarmed his parents. He had occasional perspirations at night, and some expectoration in the morning. He was easily flushed, and had been losing flesh, but the appetite and digestion were still pretty good. Beneath the centre of the left clavicle there was evident flattening, and in this situation the sound was less clear on percussion, and the expansion on full inspiration less perfect than on the opposite side. In this part respiration was harsh and somewhat

bronchial in character, but no rales were audible on either side. He was treated by counter-irritation, mild nutritious diet, and cod liver oil, and very soon improved so much as to be able to take active exercise in the open air. By the 11th of January he had gained flesh, colour, and strength in a striking degree. On the 1st of March I again saw him; he then looked as well as before his illness, and had entirely lost his cough, but continued to take the oil. On examining the chest I found a decided change; there was no flattening or dulness below the left clavicle, expansion on full inspiration was as perfect as on the opposite side, and there was no appreciable difference in the respiration on the two sides.

This patient, whose case was published in my work on consumption, has had no return of his complaint, and has grown up to be a healthy young man.

Case 2.—In consultation with Mr. Atcherley, I saw, on the 24th of December, 1850, a little boy, three years of age, who had been ill a month with cough, loss of flesh, and profuse night perspirations. The child was very pale and weak. At the upper part of the left side of the chest, in front as well as behind, there was very decided dulness on percussion, and respiration on this side was feeble when compared with the right. The physical signs of consolidation at the upper part of the left lung were so well marked that, viewing them in connexion with the general symptoms, neither of us had any doubt of the existence of tubercular deposit. The child was treated with expectorant medicines, counter-irritation, and cod liver oil, and under this treatment there was a speedy improvement, which has been maintained. Hearing lately from Mr. Atcherley that the child continued quite well, I went with him, on the 11th of March, 1853, to examine the chest for my own satisfaction. He was running about, quite well and fat, but he had a fine skin and delicate complexion, his mother observing that his colour was that of a girl rather than of a boy. On examining the chest I found below the left clavicle rather less elasticity on percussion than on the right side. Any remaining dulness was scarcely appreciable. Posteriorly there was no difference, and the intensity of respiration seemed equal on the two sides. At this early period of life, when the nutritive functions are most active, it is probable that tubercular disease may be more perfectly removed than in those in whom the lungs and other organs have attained their full growth and development, provided due attention be paid to those hygienic prophylactic means which are even more necessary in those who have been attacked with the disease than in other children who are only hereditarily predisposed.

Case 3.—A gentleman about twenty-eight years of age consulted me, in the spring of 1851, on account of severe cough without expectoration. The cough was dry and very irritating, and the patient was much changed for the worse in appearance, and had been losing flesh rapidly. The sound on percussion in the right infra-clavicular region was less clear than on the left side, and over the cartilage of the fourth rib there was a prominence where the dulness was well marked. Respiration was feebler here than on the left side, and the resonance of the voice considerably louder than natural; but there were no rales or any sign of softening having yet taken place. Behind, there were similar signs of consolidation in the situation of the spine of the scapula. In this case immediate change of air, morphia with squill, and cod liver oil were prescribed with remarkable benefit, and the patient began to improve soon after going to the country. My opinion as to its nature was confirmed by that of two eminent physicians, who subsequently examined the chest and detected the same signs. In September following, when I again examined his chest, I found that the signs of consolidation were not entirely removed, some dulness on percussion and feebleness of respiration, but less marked, still existing in the situation of the cartilage of the fourth rib. He had no cough then, and his health was exceedingly good. This patient has felt it necessary to be careful of his health, but during the following winter he was able to attend to the duties of his profession, having recourse occasionally, by way of precaution, to the use of cod liver oil. When I recently (March, 1853) had an opportunity of seeing him he had been perfectly free from cough and his health was excellent.

Case 4.—M. G., aged fifty, a man of dark complexion and rather thin, was admitted into the Liverpool Royal Infirmary, under my care, on the 18th of March, 1850. He stated that for fifteen years he had been subject to cough, especially in winter; and ten years ago he had so much cough, emaciation, and expectoration, that his medical attendant did not expect him to recover. Three years ago he was again so ill as to be unable to work for five weeks. Twelve months since he spat a considerable quantity of blood, and for six weeks before admission he had been unfit for any work, suffering from cough, expectoration, night sweats, and debility, with considerable emaciation and shortness of breath. Below the right clavicle there was dulness, some sibilant rale was audible, and the respiration had a bronchial character. He was treated with sedative expectorant remedies, cod liver oil, and mild counter-irritation, by means of an embrocation containing acetum cantharidis. His health improved under this method of treatment, and on the 27th of April he had very little cough, the expectoration was trifling in quantity, he had no perspirations at night, his appetite was good, he had become stouter, and wished to return to his work. The dulness below the right clavicle was still perceptible, but rather less so, and the respiration was free from any rales.

This case is condensed from the report of it in my work, in order that I may now state that I had an opportunity of again seeing the patient on the 4th of November following, when he was at work, free from cough, and enjoying good health. It is one of those cases of the chronic form of phthisis where the tubercular matter has probably undergone some cretaceous transformation.

Case 5.—A gentleman, aged thirty-nine, tall, and of bilious temperament, placed himself under my care, on the 17th of December, 1850, on account of frequent hacking cough, but with scarcely any expectoration. He had been ill nearly two months, and stated that two years previous he had suffered from a less severe and protracted attack, from which he had recovered under the care of a Dublin physician. He was pale and thin, and had night perspirations. After being treated, for a short time, with tonics and expectorants, which afforded only some temporary benefit, the chest was examined. Some depression was found below the left clavicle. On this side the sound on percussion was less clear than on the right, and two or three inches below the clavicle it was decidedly less resonant, respiration being also, in this spot, interrupted and mixed with a few mucous bubbles. Under the use of cod liver oil, sulphuric acid and quinine, counter-irritation, and other appropriate treatment, his health improved very greatly, and he became much stouter. When examined, about the middle of April, the difference in the clearness of sound on percussion of the two sides of the chest, was very trifling, and there was no mucous rale anywhere. An eminent physician, in Dublin, who was also consulted in this case, took so unfavourable a view of it, that he thought it indispensable that the winter should be passed in a warmer climate. The patient was, however, able to attend to the duties of his profession during the succeeding winter, without any permanent return of cough; and, during the past winter, he has only once required my services for a trifling cold—his general health continuing excellent up to this time, April, 1853.

Case 6.—In May, 1850, I was consulted respecting the health of a young lady, twenty-one years of age, of pale chlorotic complexion, and delicate constitution. She had then a cough which had also been present three years before, so as to cause some alarm, and the opinion was obtained from a physician that the upper part of the left lung was not perfectly sound. Change of climate, however, and other treatment, succeeded in restoring her health at that period. When visited by me she was very weak, she had dry cough, and became flushed with the least agitation or excitement. Decided, but not extensive, dulness on percussion, was discovered at the apex of the left lung in front. Respiration was somewhat weakened in this situation, but it was free from any of the abnormal sounds which indicate softening of tubercular matter. The opinion was therefore formed, that tubercles had been deposited in a limited spot, and had probably existed for a considerable period without tending to soften; and the hope was entertained that, by improving the general health and restoring regularity of menstruation, which was then scanty and irregular, the quiescent state might be maintained for an indefinite period of years. These indications having been carried out by

chalybeate tonics and cod liver oil—the lady has since married, and though she had a premature confinement, a satisfactory state of health has been maintained, and when I had, in April, 1853, an opportunity of seeing her ordinary medical attendant, he informed me that, though still rather a delicate person, she had been recently confined, a second time, and that she and the child were both doing very well.

Case 7.—A married lady, aged twenty-six, consulted me in the beginning of April, 1850. She stated that her father had died of consumption, and that, in April, 1849, she was confined, three weeks after which she was seized with cough, and continued to get gradually worse under the care of her ordinary medical attendant. In September, she consulted a physician, who caused her to wean her child, and put her upon a course of treatment of which the use of cod liver oil formed an essential part. Having examined her chest, he told her friends that her case was a very hopeless one. She was then very weak and emaciated, and had profuse night sweats and abundant expectoration; but her appetite improved, and the cough and other symptoms abated so much, that she was encouraged to persevere with the oil. In consequence, however, of the unfavourable opinion which had been given, she placed herself under my care. She had kept the house, carefully, during the winter, being very susceptible of cold; she was weak, though not thin, the flesh soft, and the skin so relaxed that she perspired easily, and hence the liability to attacks of cold. There was profuse menstruation, leucorrhœa, and some tendency to diarrhœa. The cough was not severe, she slept well, and expectorated but little. Below the left clavicle there was considerable depression, the sound, on percussion, was decidedly duller, and the elasticity less than on the right side. Respiration was feebler on the left side, and interrupted, occurring in whiffs, especially about two inches below the centre of the clavicle. There were no rales or other signs of active disease. This patient improved remarkably under the tonic plan of treatment detailed in my work, where these observations with reference to it were made:—"Not having seen this case at first, it is impossible for me to form an opinion as to whether a cavity had existed or not.

There can, however, be no doubt that the tubercular matter is now in a quiescent state; and, as the nutritive functions have received a healthy impulse, we may hope that by maintaining this, by removing any urgent symptoms as they may occur, and by improving the general health by tonic means and by change of air, the health of the patient may be sustained till the tubercular matter has been absorbed, or rendered innocuous by cretaceous transformation."

These favourable anticipations have been fully realized, for this lady has improved in health, and has since had an addition to her family. In March, 1853, she called twice upon me, along with friends who wished to consult me. She informed me that, after her confinement, she had spat some blood, but had never been better than since then: she had no cough, looked stout, and had no sign of active tubercular disease, but there was the same deficiency of clearness and elasticity, on percussion, below the left clavicle.

Case 8.—A lady, twenty-four years of age, rather tall and thin, consulted me in June, 1851, on account of an attack of pain in the left side of the chest. She had not much cough at that time, but had been ill two years previous, with all the worst symptoms of consumption, including spitting of blood. She had the opinion of an eminent physician in London, who concurred with her ordinary medical attendant, in thinking her case a very hopeless one. She returned, however, to the country; and, under the persistent use of cod liver oil, and other means, the disease was so completely arrested that she had passed the previous winter without suffering almost at all from cough; and continued in the enjoyment of pretty good health till she had the attack for which she applied to me. On examining the chest I found, about two inches below the centre of the left clavicle, where she had been told that the disease existed, and at the spot in which she then had pain, a slight depression; and there was dulness on percussion, not very great, but well marked. Respiration in this spot was weak, somewhat bronchial, and jerking. At the end of a deep inspiration, especially after coughing, some dry crackling crepitation was audible. This, and also some peculiar dry creaking sounds, are frequently heard in cases of arrested phthisis. The exact cause of these new sounds,

and whether produced in the tissue of the lung, or on the pleural surface, cannot, in all cases, be certainly known. In this instance, as the crepitus was superficial, and accompanied with pain and scarcely any cough, I considered that it was produced by slight inflammation in a part where old adhesion probably existed. Mild counter-irritation was therefore applied, and alterative mercurial aperients given so as to regulate the digestive functions which were much disordered. The occasional resumption of the cod liver oil was recommended, and also a tour on the continent, which proved of great service to the general health. This lady has since been confined, without any untoward circumstance, and she is now, February, 1853, free from cough, and in the enjoyment of as good health as she has ever had.

Case 9.—A gentleman, of a consumptive family, aged thirty-five, came from Warrington on the 17th of October, 1851, to consult me by the recommendation of Dr. Stokoe, his usual medical attendant. His breath was very short, his cough frequent and troublesome, and his pulse 120, very weak. Mucous and sibilant rales were heard generally over the chest, before and behind on both sides, showing that there was bronchitis; but, as these rales were most abundant at the upper parts of the chest, and there was flattening below the clavicles, especially on the left side, where there was also some dulness on percussion, we formed the opinion that tubercles also were present. He was first treated by blistering and a stimulating expectorant mixture. After this cod liver oil was taken to the extent of an ounce thrice a day, and a milder form of counter-irritation was kept up by the application of croton oil embrocation. This constituted the chief treatment, which was so successfully carried out by Dr. Stokoe that, when I again saw him, on the 12th of December, he had become stout, and so strong that he had been able to walk six miles. His pulse, which had been 120, was only 86. He had no longer any night sweats, and very little cough, with which there was some trifling yellow expectoration, in the morning. On examining the chest, the only abnormal sounds found were slight but distinct dulness below the left clavicle, and a few clicking bubbles in the same situation. When first seen he had been so weak and tottering that I did not examine the vital capacity of the chest by the spirometer, but it was now found to be 235 cubic inches, and as his height was scarcely five feet eleven inches, this was not more than 25 below the healthy standard. There was a steady increase in the weight of this patient after taking the oil. Weight, 1st November, 1851, 10st. 12lb.; 21st December, 12st. 4lb.; 22nd January, 1852, 12st. 8½lb.; 12th April, 12st. 10½lb.; 2nd May, 12st. 12lb. This patient continues (April, 1853) to enjoy very good health.

Case 10.—W. Murray, a sailor, aged 21, was admitted into the Royal Infirmary, on the 6th of December, 1849, with cough and other well marked symptoms of consumption. His mother had died of this disease, and he had been ill for three months, during which time he had suffered from two attacks of spitting of blood. His countenance had a shrunk and faded appearance, and he was weak and considerably emaciated. His cough was violent, and he frequently vomited with it. The expectoration consisted of some ropy white mucus, he had perspirations at night, and pain below the right clavicle, and the breath was short. The skin was hot, the pulse 90, the tongue furred, and the bowels costive. There was well marked dulness below the right clavicle, harsh respiration with sibilant rale, loud prolonged expiration, and loud resonance of the voice and cough. He was treated with alterative mercurial aperients, cod liver oil, and inunction of a small quantity of iodide of mercury ointment below the right clavicle. He speedily improved under this treatment, but a small quantity of the tubercular matter softened, and a very small cavity formed at the right apex. He was made an out-patient on the 24th of January, but continued under treatment till the 27th of February. He was then a good looking young man, stout and muscular, with a healthy colour. On examining the chest I could find scarcely any dulness below the right clavicle. There were no rales or signs of any secretion, but respiration was rough, and the expiratory murmur prolonged; the resonance of the voice and cough was also louder than on the other side.

This case is condensed from the report of it in my work, and I now revert to it in order to state that I had an opportunity, more

than a year after, of seeing the patient several times. He was in the enjoyment of good health and free from cough. On examining the chest I still found slight deficiency of clearness on percussion below the right clavicle, and harsh, rather feeble respiration, but no sign of any return of active disease.

Case 11.—A gentleman, thirty-one years of age, one of whose sisters had died of consumption, became affected with cough about Christmas, 1848. He had felt languid and out of health all winter, and towards the middle of May, while walking upon the street, he was attacked with spitting of blood. The attack was severe, and did not stop till he had coughed up nearly a pint of blood. I saw him in the beginning of June along with his ordinary medical attendant. He was then pale and weak, but had not lost flesh to any great extent, though he had the usual symptoms of consumption. About three inches below the right clavicle very decided dulness on percussion was found, and in the same situation there were all the signs of a cavity of considerable size. The disease was arrested by country air, counter-irritation, and the prolonged use of oil and other means. I examined the chest on the 20th of April, 1849, and found considerable depression and some loss of elasticity in the situation where the cavity had been found, but the dulness was less marked. There was dry harsh respiration, and loud resonance of the voice, but none of the former signs of a cavity. He looked remarkably stout and well, and scarcely coughed at all, except a few times in the morning when he brought up a little mucus. This case was recorded in my work as a satisfactory one of recovery after a cavity had formed. I must now however state, that the disease returned; he had an attack of spitting of blood, after which the usual symptoms of consumption again showed themselves, and he died in the beginning of April, 1852. In this instance, therefore, the disease returned and proved fatal, after having been arrested, in a very complete manner, for nearly four years.

Case 12.—Thomas Hanlon, aged twenty-seven, was admitted into the Royal Infirmary, on the 21st of February, 1850, with all the usual symptoms of advanced consumption, and having also the physical signs of a large cavity towards the upper part of the right lung. There were also the signs of an earlier stage of the disease in the left lung. He remained two months in the institution, at the end of which time I succeeded in arresting the disease, and he was then in such an improved state of health that he was able to return to hard work; and he maintained himself by his own labour till the following December, when he again presented himself for admission, in consequence of having been attacked with acute inflammation of the upper part of the left lung. He had been employed as a fire-man, and the attack had been brought on by exposing himself to the cold air when in a state of profuse perspiration. On his second admission he had a stout healthy appearance, much more so than when he had been discharged in the preceding March. This corresponded with the statement he made, that previous to the attack of inflammation he had been in good health, and almost entirely free from cough. By means of blistering, and other active treatment, I succeeded in removing the inflammation of the lung, but the tubercular disease which had been quiescent was again lighted up into activity, and fresh cavities formed at the upper part of the left lung. I again, however, after three months treatment, succeeded in suspending the progress of the disease, and he so far regained his health that he was able to go out, and again maintain himself by his own labour, from March till November, 1851. He was then admitted the third time, labouring under another acute attack brought on in a similar way. He had acute bronchitis, with great congestion of the lungs, and he expectorated large quantities of thin serous fluid. This attack proved fatal in a few days.

The post mortem examination was highly interesting, as it showed the condition of the lungs in a case where the tubercular disease had been arrested, and the death of the patient was not the direct effect of this, but of an acute inflammatory and congestive attack; and as it proved also how much may be done, even in an advanced case, to arrest and also repair the injury done by tubercular disease. The right lung was firmly adherent at the upper part. Near the apex, anteriorly, there was a cavity large enough to contain a large apple, having an irregular surface with projecting ridges, as if formed by the union of several small ones. It was lined with a greyish white

membrane, which was well organised, and evidently contracting. There were some deep red spots and patches upon it, apparently indicating the occurrence of recent inflammation in the new structure. In the centre of several of these spots, small openings into the bronchial tubes were perceived, and seemed to show that inflammation had extended from the bronchi. The walls of the cavity were very hard. The apex of the lung was very dense, and there were tubercles and small cavities in this part. Below the large cavity there was another the size of a walnut, and lined with a white membrane, free from any purulent secretion. At the apex of the left lung there was also a large cavity lined in the same way, and throughout both lungs there were tubercles more or less advanced, and generally of a dark colour, proving that they had not been recently deposited.

The powerful effort made on the part of the constitution, when assisted by proper treatment, to repair the local injury here, is particularly worthy of notice; and this was so far successful that the cavities were lined by membranes which did not secrete any matter, and were contracting. This process had arrested the disease on two occasions, and prevented it proving fatal in the ordinary way—that is, by hectic fever and the exhausting discharge of purulent matter. In all cases of suspended phthisis, such exposure to cold as suddenly drives the blood from the surface to the lungs, or even a rapid fall of temperature in-doors may, when the pulmonary circulation is obstructed by tubercular disease, produce such congestion, dyspnœa and copious serous expectoration, as occurred in this case. In some its force will be expended in causing inflammation of the pulmonary tissue rather than of the bronchial mucous membrane; and in other cases the congestion may be relieved by spitting of blood. It is therefore a matter of primary importance in all cases where consumption is arrested, to prevent the occurrence of such congestion by every means at the command of the patient; and I can conceive that, if this patient, instead of being obliged to work hard, had been able to pass the winter in a mild climate, or with such comforts as wealth could afford, the issue might still have been pending. In another case of arrested consumption, where the patient died of serous apoplexy, (tubercular menengitis?) with copious effusion in the ventricles of the brain, having been ill less than twenty-four hours with the head symptoms, I found the condition of the lungs such as has been now described, cavities lined with fibrous membrane not secreting pus, and the tissue of the lung, where the tubercular matter had been deposited, unusually hard.

Case 13.—A very tall gentleman, aged twenty-four, came from Oldham to consult me, on the 4th of July, 1851. He stated that he had begun to feel weak, and his health had declined from November, 1849. In May, 1850, he had cough and some expectoration, but no night sweats till the following month. He commenced taking cod liver oil in May, but did not improve very decidedly, and in July was worse than he had at any time been. In September he spat blood. He passed the winter in Hastings, still using the oil and keeping up permanent counter-irritation over the chest. Upon the whole he did not lose ground there, though his strength rather declined. On his return to Oldham, five weeks before he visited me, there was a decided improvement in his strength. I found him rather stout: the cough affected him chiefly in the morning, when he had still some expectoration. The pulse was 78, the tongue clean, the digestive powers good, no thirst, and no night perspirations. The examination of the chest showed the existence of a very considerable amount of disease at the upper part of the left lung, much more than one should have been led to expect, in judging from his appearance. The conformation of the chest was unusual; the sternum was prominent, and there was flatness on each side, especially below the left clavicle, and the shoulders sloping very much gave the whole chest a remarkable, conical appearance. The sound on percussion was not clear beneath either clavicle, but it was duller below the left than the right. Respiration was less distinct, and had less of the vesicular character below the left; and in this situation there was some dry crackling crepitus at the end of full inspiration. The crackling extended considerably below the nipple, and also laterally; but it was most distinctly audible immediately below the scapular end of the clavicle. Below the right

clavicle respiration had a harsh character, and the voice and cough were loud. The condition of the patient at the time of consulting me was, upon the whole, rather satisfactory, the disease being then stayed in its progress. His objects were therefore to have himself placed under a plan of treatment, by which the improvement already effected might be carried forward still further, and also to know my opinion as to whether it might be desirable for him to try the effect of removal to the climate of Australia. My opinion was, upon the whole, rather favourable to removal, provided the improvement in his health should continue to advance during the summer. The means used having succeeded in attaining this object he went out to Australia, and his subsequent progress I give in the words of his father's letter to me:—"He arrived in Melbourne, May 21st, in improved health. His cough was still a little troublesome, but he had expectorated none for two months previously. His strength was increased, appetite excellent, sleep sound. The last letter I received from him came by the Marco Polo, and was dated October 12th. He stated that he continues to improve. The fine spring weather had set in, and he found the air exceedingly soft and balmy, but, at the same time, very stimulating,—quite of another character from any climate he had ever experienced. He had begun again to take his cod liver oil. He had left off taking it at sea, having no proper medicine to take it in. A physician of Melbourne had examined him with the stethoscope when he landed, and again in October, and he stated that he was much improved."

Case 14.—A gentleman, twenty-two years of age, who had lost a brother and a sister from consumption, placed himself under my care, on the 19th of August, 1851, on account of cough, loss of flesh and strength, and the usual symptoms of consumption, with considerable hectic fever. The physical signs indicated very clearly that a small quantity of tubercular matter was deposited at the apex of both lungs, and was in the process of softening. There was slight dulness at the upper part of the chest, in front, on both sides, and a few moist clicking bubbles. He had pain beneath both clavicles, and considerable constitutional disturbance. The tongue was furred, the pulse 90. There was thirst, and the digestive functions were much disordered. Saline sedative treatment, counter-irritation, and mild mercurial aperients were first prescribed. Afterwards cod liver oil and light nutritious diet were ordered, and he was then sent to Ireland for change of air. He returned in November, looking very stout and well, and having gained a stone in weight. His pulse, which had been 90, was then only 70, and he had scarcely any cough. A few large bubbles could still, however, be heard when he took a deep inspiration, and respiration beneath each clavicle was harsh. During the winter the patient fully maintained his ground, and almost altogether lost his cough. His health was so good that he did not lose a single day from his office. He persisted in the use of the oil, and in foggy weather he wore a respirator. On the 25th of November, 1852, he again consulted me, and stated that he had continued to take cod liver oil pretty regularly, but had left it off during the hot weather in summer. His health had kept very good until a month previous, when, not feeling so well, he resumed the use of the oil, but had found it not to agree with him so well as formerly. This was evidently owing to a deranged state of the digestive organs, admitting of being easily rectified. He had also some cough, and return of night perspirations. An examination of the chest showed that there was now a small cavity at the apex of the left lung, which was nearly dry. Mild alterative mercurial aperients were again employed to regulate the digestive functions; cod liver oil was afterwards resumed, and counter-irritation used by an embrocation containing croton oil, chloroform, oil of bitter almonds, soap liniment, and rectified spirit. As the local disease showed a tendency to resume activity, though the general health was still good, and the patient had kept up his flesh and strength, I proposed that he should make arrangements to pass the winter in a warmer climate. The next time I saw him, he informed me of his intention to go out to Australia, a course I did not disapprove of, and he sailed on the 1st of January, 1853.

Case 15.—A gentleman residing in Manchester, twenty-four years of age, rather short and muscular, occasionally consults me. Though he has a moderate sized cavity at the very apex of the left lung, and there has been an amount of tubercular disease, which has

left complete dulness on percussion, and entire absence of vesicular respiration in the infra-clavicular region, he has all the appearance of health, and attends regularly to his business, though he does not feel quite as strong as formerly. He was attacked with cough in April, 1852, in consequence of getting wet, and the usual symptoms of consumption showed themselves. In the end of May he began to take cod liver oil, after which some improvement first began to show itself. On the 16th of February, 1853, I examined him carefully; he had been taking a tablespoonful of cod liver oil regularly twice a-day, and was anxious to have a change in the treatment, as he found himself in a stationary position. He had scarcely any cough; but expectorated a few times in the day, especially after meals. The pulse was 94, he had no perspirations, and his strength was good; but after lifting something heavy, he had on two or three occasions seen a little blood in the expectoration. The tongue was clean, the appetite good, and the bowels regular. There was no sinking below the left clavicle; but the sound on percussion was completely dull; there were no rales, but respiration was absent, and the sounds of the heart loudly transmitted to the ear. Over the scapular end of the clavicle all the signs of a moderate sized cavity, almost dry, were perceived. Below the right clavicle the resonance of the cough was loud, and respiration was interrupted. Syrup of the iodide of iron was ordered to be taken with the oil, and iodide of lead ointment to be rubbed in below the left clavicle.

The great amount of consolidation indicated by complete dulness and absence of respiration is the most remarkable point of interest in this case. As a general rule, it may be said that a great degree of dulness in this situation is an unfavourable sign, indicating a corresponding amount of tubercular deposition; but, where it occurs in a case like this, in which the disease is so satisfactorily arrested, and the health restored, the question suggests itself, whether it may not be caused more by that fibro cartilaginous matter deposited in the walls and around cavities which have a healing tendency, than by ordinary tubercular deposit. Such a view of the case points to the use of local means to promote absorption, such as the iodides of mercury and lead; and, taking this more favourable view of the case, I have made use of these means, which may not be altogether devoid of power, to promote absorption even of true tubercular deposits.

Case 16.—Miss C., a lady about forty years of age, tall and of large frame, came from Warrington on the 25th of November, 1852, to consult me. She had been ill with cough and other symptoms of consumption for five years, and her illness had begun at that time with spitting of blood, but she had also had an attack of spitting of blood about twenty years before. She had consulted many medical men, and had been told, at an early period of her illness, by a physician in London, that her left lung was much diseased, and her case altogether a hopeless one. She had been most persevering in the use of cod liver oil, and when I saw her, was still taking it under the advice of Dr. Stokoe. She was pale, and her flesh was soft and relaxed. The tubercular disease of the lungs was arrested, she had scarcely any cough or expectoration, and the pulse was only 80. Beneath the right clavicle the sound on percussion was clear. Immediately below the left, it was less clear than on the right side. In the left mammary region it was decidedly duller than natural. Respiration was harsh in this situation near the sternum, and more externally cavernous respiration and pectoriloquy were very distinctly audible. Some mucous rales could also be heard. A tonic plan of treatment with quinine and sulphate of zinc, and the continuance of a moderate quantity of cod liver oil were recommended.

I did not again see her till the 11th of January following, when a new set of symptoms had developed themselves. She then had pain at the stomach, with sickness and vomiting of every kind of food, but no pulmonary symptoms. Some of the ordinary means relieved these symptoms, but, ultimately, everything failed, and Mr. Atcherley (who attended the case with me) and I were obliged to trust almost entirely to the use of nutritive injections containing wine and brandy to support the patient. She rallied however, so far as to be able, about the middle of February, to return to Warrington, where she was sustained in the same way, and by minute quantities of light nourishment taken by the stomach, till the 23rd of April,

1853. During that time no new symptom of importance showed itself, except that, on one occasion, she lost a large quantity of blood from the bowels.

The patient having, during her life, expressed a wish, that after her death an examination should be made, and the case being a most interesting one in reference to the arrested disease of the lungs, as well as the obscurity of the gastric symptoms, I went over to Warrington, and with Dr. Stokoe and Mr. Atcherley, made an examination. The right lung was healthy, with the exception of a single dark-coloured old tubercle at the very apex. The left pleura was extensively adherent, and at the posterior part of the lung, four inches below the apex, there was a very distinct cicatrix running transversely an inch in length, and penetrating half an inch into the lung. It must have resulted from the healing of a cavity of very considerable size. Deeper still there was a cavity the size of a moderate walnut, lined with a thick rather soft membrane, and filled with a thick secretion of a greyish white colour, more consistent than pus, and not unlike sebaceous matter. In front, the upper lobe was contracted and more dense than natural. About an inch and a half below the apex there was a cavity smaller than the first, and lined completely with a firm well organised fibrous membrane. The tissue of the lung, lower down, was firm and rather shrunk, and it contained two or three small cyst-like cells filled with a thin yellowish fluid. In their vicinity there were one or two very small cretaceous bodies, the sole remnants of absorbed tubercles; and as the lungs were in other respects healthy, and the two cavities in process of contraction, or at least producing no injurious effect upon the health, there is no reason to doubt that, so far as the lungs were concerned, this individual might have lived to an advanced age.

An examination of the liver and stomach showed at once the cause of the distressing sickness, vomiting, and pain, from which she had so long suffered, and proved that she had not died from the pulmonary disease, but from *cancer* of the *liver*. There were several white tubera of soft cancer, some of which had become adherent to the stomach, and ulcerated through it; but there was no cancerous disease of the stomach itself.

In the preceding cases, the fact of the disease being true tubercular consumption, rests not merely on the symptoms, but on unmistakeable physical signs furnished by stethoscopic examination of the chest. It is however in the early stage of consumption, when the tubercles are so small and imperfectly developed that they do not give evidence of their presence by physical signs, or only so obscurely, that we cannot cite such cases as positive instances of recovery from phthisis, that most can be done by medical treatment and hygienic means to avert the disease, or effect a permanent cure. We should not therefore reject altogether the evidence in favour of permanent curability, furnished by those cases where the ordinary symptoms of the disease are present, but the physical signs are obscure or wanting, more especially if there be family predisposition, seeing that in this class of cases we have, in the absence of physical signs, all the evidence which the nature of consumption, in its earliest stage, admits of. Of this class of cases I might give many examples, but the following illustration will suffice.

Case 17.—I visited, at Birkenhead, on the 25th of October, 1851, a lady about thirty years of age, whom I saw in consultation with Dr. Robertson. She had lost two sisters from consumption, and her constitution was delicate, and she had always been liable to catarrhal attacks. She was pale, thin, and weak; and had been suffering from a trifling cough for some months, which had been so much aggravated by exposure to wet on the occasion of her Majesty visiting Liverpool, on the 9th of October, that she had from that time been confined to the house. She had lost flesh, and had night perspirations and some expectoration with the cough in the morning. The pulse was 120, small and weak; the tongue clean, but pale and flabby; the bowels costive, and the catamenia rather abundant. She had never had spitting of blood; but her declining health alarmed her friends, more especially as two sisters had gone off in a similar manner. On examining the chest, it was found that the infra-clavicular spaces were flat and hollow on both sides; but there was no marked difference of sound on percussion. Below the left clavicle respiration seemed rather harsh, and in the left shoulder she had frequently felt some pain; but, as there was no abnormal physical sign beyond the harshness of the respiration, we considered that any tubercles which might exist were in the earliest stage of their progress. We directed our attention to the improvement of the general health by a tonic plan of treatment, giving her citrate of iron and afterwards cod liver oil. These means succeeded in averting the disease, the patient got quite well, and has continued so; and though we cannot claim this as an undoubted case of consumption arrested or cured, yet I have very little doubt that, if left to itself, it would have pursued the more ordinary course of the disease, and have ultimately proved fatal, as in the case of the two sisters.

Summary of Results in previous Cases.—The cases which have been detailed scarcely as yet form a sufficient basis for general inductions as to the permanence of recovery from consumption, and, as time will both increase their number and give greater weight to any general conclusions, we shall at present take only a summary review of the actual results which they furnish.

In the *first* case the disease was in the early stage before any softening and disorganisation of the lung had occurred, recovery seems to be complete, and there is, therefore, good reason to expect that it may be permanent. In the *second*, a degree of dulness, indicating a very considerable amount of consolidation, has been almost completely removed, and the general health perfectly restored for nearly two years and a half; and as this has occurred at an early period of life, when tubercular disease does not commonly attack the lungs, there is sufficient ground to believe that the judicious use of hygienic means and prophylactic treatment may enable the child to outgrow the tubercular tendency entirely. In the *third*, the disease had not gone beyond the first stage; but remaining dulness shows that there is pulmonary induration, or partially absorbed tubercular matter, which may have undergone cretaceous transformation. In other respects recovery is most perfect; and there is reason to hope that, with due care on the part of the patient, it may prove permanent. In the *fourth*, the tubercular matter is probably cretaceous, recovery is very good, and, as the period of life of the patient—above fifty years of age—lessens the tubercular tendency, there is reason to expect that due care may prevent the activity of the disease being renewed. In the *fifth*, the disease was in the first stage; and a very perfect recovery has been effected. The *sixth* is a case where the slow progress of the disease, and the fact of it being arrested in the first stage, are grounds for hope; whilst on the other hand the natural delicacy of constitution is a reason to fear that slight exciting causes might rekindle the activity of the tubercular deposit. The *seventh* and *eighth* are cases where the amount of tubercular deposit has been small; and it is not improbable that it has reached a condition similar to what was described as found in the lung of the gentleman who died of aneurism. (Page 3.) If so, a similar degree of permanence may be reasonably looked for. In the *ninth*, the disease had reached the second stage; recovery being very perfect, there is some ground to hope that it may also be permanent. In the *tenth* case, the disease had arrived at the third stage; but its extent was more limited than in most cases so far advanced, and the general health had never sunk to a low point. These circumstances and the perfect restoration of the general health, with almost complete removal of the local signs, lead us to believe that the small cavity, if not already obliterated, may ultimately be completely healed. The fatal result in the *eleventh* case, where a good recovery of very considerable duration had been made, shows that there is uncertainty as to the result of all those cases where a cavity of considerable size has once been known to exist, however perfectly the disease may seem to be arrested. The termination in the *twelfth* would lead to a similar observation; but in this case it is satisfactory to add that, though the original extent of the disease precluded any favourable anticipations, reparation was carried forward to a much greater extent than was expected, so that the disease did not prove fatal in the ordinary way, but by an accidental inflammatory complication. In the *thirteenth* and *fourteenth* cases it is hoped that, as the constitutional powers are good, the alterative influence of a complete change of climate may enable them to maintain the ascendency over the local disease; and if the opinion advanced as to the cause of the dulness in the *fifteenth* be

correct, it may be hoped that the good state of the general health may effect a similar result. The *sixteenth* is undoubtedly one of the most interesting cases on record. It furnishes a most important link in the chain of evidence in favour of the curability of consumption, and also of its curability by treatment. Reparation was not only carried so far forward by absorption and elimination of the tubercular deposit, which was almost wholly removed, and the two remaining cavities so nearly healed that no injurious effects could afterwards have been produced by them on the health of the patient, but the tubercular diathesis itself had been so completely eradicated that another—the cancerous, usually considered to be almost incompatible with the tubercular—had sprung up in its place.

General observation of tubercular disease of the lungs, as well as the results in some of the previous cases, enable me to state with confidence the opinion that perfect recovery in the early stage may not unfrequently be permanent; that it may likewise be so not very unfrequently in those advancing into the second stage when the extent of disease is limited; but that, in those cases in the third stage where one or more cavities of considerable size exist, perfect recovery is so rare that it can be permanent only in exceptional cases. It is however satisfactory to know that, though the ultimate result must in these cases be very generally unfavourable, the disease may often be suspended, and a fair amount of health enjoyed by the patient for an indefinite period of years.

In a recently published voluminous work on tuberculosis, Ancell has argued strongly in favour of the curability of tubercular affections of the lungs as well as of other organs, and he makes the following remarks on the necessity of continued care on the part of those so affected: "The greatest caution is necessary in pronouncing a patient cured who has once been tuberculous. Blood once tuberculous, whether by hereditary descent or by acquisition, is so prone to relapse under the original or new anti-hygienic influences, that it requires good judgment to determine when those therapeutic rules which may have been adopted should be relaxed, and to pronounce when, and under what circumstances, the patient is safe. At the period of convalescence, patients or their friends most frequently take the law into their own hands, and many have, accordingly, lost their lives who might have distanced the disease had they continued to follow medical advice. For this, the profession is not amenable; but if we overlook the tendency to relapse, and sanction the injudicious proceedings of others, not only ourselves individually, but the science of medicine suffers in public estimation." In these observations I entirely coincide, having often had occasion to regret the want of steady perseverance in the use of means on the part of patients in whom the disease had been arrested.

Curative value of Cod Liver Oil and other oils reviewed.—My chief object in relating the previous cases having been to bring forward the condition of the patient when first seen, more especially with reference to the symptoms and the local signs of disease, and to show the amount of improvement attained and the length of time it has continued, I have not detailed the treatment so fully as I should otherwise have done. I may now however observe that, in all the cases, the use of cod liver oil, appropriately administered, and combined with such other treatment as the particular circumstances in each required, formed an essential part of the treatment. I need scarcely therefore add that they constitute the strongest evidence I could give of my unshaken confidence in the value of this remedial agent, which is now universally acknowledged to have a stronger claim to be considered as a curative remedy than any other hitherto discovered. I consider it the most valuable medicine that has of late years been added to the *Materia Medica*, applicable alike to the treatment not only of consumption when it has shown itself by the presence of tubercles or ulceration in the lungs, but also to all those states where there is a scrofulous or tubercular taint of the blood or system predisposing the individual to these and other local tubercular deposits. I have also found it peculiarly valuable in some cases of tubercular disease of the mesenteric glands and peritoneum, where it seems to be even more efficacious than in the same disease affecting the lungs.* As it is important that all medical men should

* See the author's Clinical Lectures on Dropsy and on Tubercular Peritonitis. *Medical Times and Gazette*, vol. v., pages 56, 157, and 431.

be so impressed with the value of this remedy as to have the utmost confidence in persevering with its use, I may here quote the opinions of some of the latest writers who have had much experience in its employment. Dr. Wash says, "It more rapidly and effectually induces improvement in the general and local symptoms than any other known agent." Ancell observes, "This is the most important therapeutic agent that has yet been discovered for the treatment of tuberculosis." Dr. Cotton remarks that "Some prejudice against its employment still exists, based upon a belief that its good effects are not lasting; and that it fattens without permanently improving the health or adding to the strength. It certainly does so in a considerable number of cases; but, on the other hand, the examples of its successful employment are so numerous and unquestionable that we have, I think, only to bear in mind the character of the disease we are dealing with, and how utterly powerless against it are the majority of individual agents, to be forced to the admission that the use of cod liver oil was the commencement of a new era in the treatment of consumption." I may therefore assert that the opinion has been fully borne out which I expressed in my work, in these words, "Cod liver oil is not a mere fashionable remedy of the day, as some would insinuate, but will, if not *indiscriminately* used, and *exclusively* trusted to, maintain the reputation it has attained."

What I have now to add respecting this remedy has reference chiefly to the careless or indiscriminate way in which it is too often used, and the exclusive manner in which some trust to it without so combining the use of other appropriate means suited to the nature of each case, and the complications which are continually liable to occur, as may enable the patient to derive the full benefit it is capable of producing. It may perhaps be said that every remedy is thus liable to suffer from the injudicious way in which it may be used, but this is especially apt to happen with one like cod liver oil, which is too often taken without any medical advice, and in cases where it is not required; whilst in cases of consumption, it is either not persevered with sufficiently, or is considered the sole treatment necessary. In order however to draw out the full power of the remedy, great attention must be paid to hygienic treatment; the stomach and digestive functions must be carefully attended to, and the secretions from the liver and bowels duly regulated from time to time. All inflammatory complications affecting the lung itself, the pleura, or the bronchial mucous membrane, must be removed by the ordinary means. The cough, and also the general irritability arising from such a depressing and exhausting disease, call for the use of appropriate sedative and stimulating remedies, and the perspirations of hectic fever for astringent and acid medicines. Diarrhœa, spitting of blood, and inflammatory complications, often necessitate the omission of cod liver oil for a time, but it must never be assumed that because these complications occur during its use, they are the effect of the remedy, or when, from any other circumstance, the oil has ceased for a time to be of service, that therefore its good effects have been exhausted. It has often happened to me to find, after using the oil for a considerable period, as much as a month or more, without being able to perceive an appreciable good effect, that, either from a change in the condition of the patient, or from some alteration being made in the other means of treatment, the beneficial operation of the remedy has begun to develop itself, and there has afterwards been a steady improvement. Much judgment and skill may therefore be shown by the physician in seeking out and removing the opposing complications which so often interfere with its successful employment, after which a steady perseverance is required in order to draw out all its curative power. The following case will illustrate some of these remarks. It is one of pleurisy, with effusion occurring as a complication along with tubercular disease of the lung; and it shows how important it is that this severe complication should not be overlooked, but treated with appropriate antiphlogistic remedies, whilst theuse of cod liver oil is laid aside for a time.

Case 18.—A gentleman, aged twenty, came from Southport to consult me on the 18th of November, 1852, having been recommended to go to Bowdon for change of air. He had a fair complexion, and was pale and delicate looking, but, though he had lost flesh, he was not much emaciated, having been trying to take cod liver oil up to the time I saw him. His chief object in consulting

me was not so much to know the condition of the lungs, respecting which he had already had the opinion of an eminent physician in London, soon after an attack of spitting of blood, but to see if I could devise any means to enable him to take cod liver oil, which had not agreed with him for three weeks. I found that for that length of time he had been troubled with a pain in the right side of the chest, and that his breath had become very short. The tongue was furred, the appetite bad, there was thirst, and the pulse was 110, symptoms all indicating a greater amount of fever than we usually find in cases which have scarcely entered into the second stage. He had evening fever, but not much perspiration in the night. Some moist crepitation below the right clavicle appeared to indicate the existence of tubercular deposit there; but the whole of the right side, especially inferiorly, was completely dull, and respiration suppressed. Percussion also still caused pain, and no vibration was communicated to the hand by the voice. It was at once evident to me that the original tubercular affection of the lungs had become complicated with acute pleurisy three weeks previous, that this had produced effusion into the chest, and had been the cause of the inability to take the oil; and that the patient needed active treatment, and was in a very unfit state to derive any benefit from change of air till the inflammation should be subdued.

A blister was applied to the side, and a mixture ordered, containing iodide of potassium, solution of potassa, and spirit of nitric ether; and, as there was a tendency to diarrhœa, small doses of grey powder, with rhubarb and Dover's powder, were given to regulate the bowels. The cough was allayed by a linctus containing oxymel of squill, tincture of digitalis, compound tincture of camphor, and prussic acid. Under this treatment there was a most rapid improvement, the pain and shortness of breath were removed, the fluid was absorbed, the appetite returned, and he was able on the 27th of November to resume the use of the oil. Finally he gained much benefit from change of air, and on the 25th of January he called upon me, on his return, for the purpose of thanking me, and stating that he felt quite well. Three days after I had an opportunity of seeing and examining him. He had become so stout and fresh in the colour that I scarcely knew him. He had become strong and active. The tongue was clean, the appetite good, and the bowels regular; the pulse was 86. He had no perspirations, very little cough, and hardly any expectoration. The respiration had returned at the lower part of the right side of the chest, and the sound on percussion had become clear; but there were still some indications of tubercles at the upper part of the right as well as the left lung. Below the right clavicle percussion was not so clear as natural, and a few bubbles were still heard on full inspiration where the crepitation had formerly been perceived. At the left nipple too, and in the axilla, a few viscid mucous bubbles were perceived, and appeared to show that some isolated tubercles had softened there.

The patient conceived that he was perfectly well, and was most anxious to enter into business; but I strongly recommended him to devote his attention entirely for a time to the improvement of his health, and advised him to continue the oil along with the syrup of iodide of iron. Since this was written I was sent for to see this gentleman again, on the 20th of April. I found that, feeling himself very well, he had resolved to give his attention to business, and in the middle of March had set out on a journey with this intention, but was attacked with spitting of blood, followed by pleuritic effusion on the left side, for which he is now under treatment.

In many cases of this disease, especially where it has made considerable advance, the use of cod liver oil must be continued for months, or even years, being omitted only at times, during short intervals. It is important that the patient should be aware of this; for I believe that the full effects of the remedy are seldom attained unless the patient appreciates its beneficial action, and gives hearty and persevering co-operation.

I have often had cause to regret, in those consulting me, the loss of valuable time during which the disease had been destroying the lungs, while the patient had either been neglecting the remedy or giving it only such an imperfect trial as rather prejudiced him against it. I had at the beginning of last winter a gentleman under my care who resided in the neighbourhood of Manchester, and had, during his illness, consulted many medical men; but owing in some measure to the importance of this part of the treatment not having been duly impressed upon him, as well as to his own wayward disposition and his objection to take the oil, no fair trial had ever been given to it. He was in so advanced a stage, and so extremely weak, that I had very little expectation of any decided benefit; but, as no proper trial of the oil had ever been made, I urged him strongly, and succeeded in overcoming his objection to it. A very speedy and decided improvement took place in all the symptoms, so that he was enabled afterwards to take a journey into the south of England. In a case like this, where the remedy has been so obviously beneficial, we cannot but regret that it was not used at an earlier period, so that the improvement, which is still maintained to some extent, might have begun before the lungs were so seriously disorganised.

When a patient states that he cannot take the oil on account of sickness, or because it rises again, we should not be readily induced to lay it aside altogether, though it may in some instances be necessary to intermit its use for a short time, in order to remove the irritability of the stomach, or the cause on which it may be dependent. I know, however, that some medical men, who cannot even yet be fully impressed with the value of this medicine in phthisis, are in the habit of telling their patients that, as the oil does not agree with them, other treatment must be used instead. This I consider to be a grievous mistake, as there is as yet no other remedy, except it were some of the other oils, all of which are less easily assimilated, which could serve as a substitute. Other means should therefore be used, not to replace it, but to prepare the system for the oil, to remove opposing complications, and to educe more fully its beneficial properties.

There are a variety of means useful in removing this irritability or weakness of stomach, some of which are the same as we find applicable to the treatment of ordinary dyspepsia. Sometimes tonic bitters, such as gentian or calumba, are useful, or some of the preparations of iron or quinine. Alkaline remedies are occasionally of service; but I have more frequently found acids beneficial, more especially the nitro-muriatic and the phosphoric. The oil may often be taken most advantageously on the surface of a mixture composed of nitric and muriatic acids, syrup of lemons, and infusion of orange. Tincture of gentian may be added to this, and will sometimes render it more efficacious, though less palatable, and phosphoric acid may be substituted for the other acids. Ancell says he has found considerable advantage from one of the daily doses being taken with a small cup full of new milk and a dessert spoonful of rum early in the morning. Ordinary means however of disguising the flavour of the oil, or of improving the tone of the stomach, fail in many cases in rendering it tolerant of the remedy on account of a special irritability of the stomach peculiar to phthisis, and which causes rejection of food as well as oil. There are some pyrogenic remedies, which I shall presently have to mention, peculiarly adapted to meet this condition.

The external application of cod liver oil is a method of using it which has lately attracted some notice. It is not however one of which I have much experience; for I have preferred the more natural mode of introducing it into the system by the stomach, and I have scarcely met with a case, unless far advanced, where I have not succeeded after a time in bringing the stomach into a condition to bear it. At the same time, there are facts which seem to show that this is a mode of introducing it which should not be altogether overlooked, as it may occasionally bring the system under the influence of the remedy where it could not be borne in the ordinary way. Dr. Theophilus Thompson (Lectures, *Lancet*) has related some cases which prove that this very unpleasant mode of using the oil may sometimes be of material service; particularly the case of a gentleman, confined to bed, emaciated, hectic, and apparently failing rapidly, with a cavity at the apex of the right lung. There was diarrhœa preventing the use of the oil internally, and he therefore ordered an ounce of cod liver oil, combined with oil of lavender, to be rubbed into the chest night and morning. He rallied, and recovered so far as to be able to ride about on horseback, and when last examined the physical signs indicated a reduction in the size of the cavity. He has related another case where it was also of decided

use; and he has adverted to some experiments made by a German physician, which show that dogs may be fattened by having cod liver oil rubbed into the skin.

Action of Cod Liver Oil.—The mode in which cod liver oil acts upon the system is a most interesting subject for inquiry. It has attracted some attention, but has not received all the investigation which its practical importance demands. It is not a matter of mere speculative interest; for, if the mode of action were certainly known, such knowledge would form a sure basis for further improvements in the treatment of consumption and other diseases. Some advance towards a solution of the problem has been gained by the discovery of the fact that other animal oils, as well as cod liver oil, have a similar, though none of them an equal, efficacy. Dr. T. Thompson found that neats' foot oil has in some instances no inconsiderable power of arresting phthisis; and he has recorded cases in which it was of very decided service. I made a trial of it in a case under my care in the Infirmary, but found it more difficult of digestion, and less efficacious than cod liver oil, after substituting which there was a rapid improvement in the condition of the patient. Train and spermaceti oils have likewise been tried at the Consumption Hospital, and the fact that all of them possess some efficacy has been placed beyond dispute; but the oils obtained from the livers of fish, especially the cod fish, still stand unrivalled in respect to the facility with which they are assimilated by the digestive organs, as well as their power of arresting the progress of tubercular disease.

The germ of many discoveries no doubt lies hidden in the researches of former ages, which were certainly more fruitful in experimental therapeutics than the present, which has, however, by turning its inquiries into the fields of physiology and pathology laid a better foundation for such researches.*

Organic chemistry is a rapidly advancing science which must soon

* It is not unworthy of notice that, nearly a century ago, cod liver oil was recognised as a remedy of no mean value, though its efficacy in consumption continued unknown; also that suet dissolved in milk was known as a remedial article of diet in consumption in the time of Dr. Young. Yet it is strange that two such

throw more light upon the *modus operandi* of this remedy, and Liebeg has justly observed, that without a profound knowledge of chemistry and natural philosophy, physiology and medicine will obtain no light to guide them in the solution of their most important problems,—that is in the investigation of the laws of life, the vital processes and the removal of abnormal states of the organism. Now the fact that other oils as well as cod liver oil have the power of controlling phthisis, proves that the efficacy of this oil does not depend upon the accidental ingredients—the iodine, the bromine, the phosphorus, or the biliary matter, to each of which its peculiar action had been attributed, but upon the essential oily principles. This leads us to ask what is the composition of oils generally, and of cod liver oil particularly. Oils and fat are generally combinations of fatty acids with oxide of lipyl, which may be separated in the form of glycerine. Lehmann regards them as haloid salts, formed by the combination of a haloid base with an organic acid, and he places together the oxides of ethyl, methyl, and lipyl, as belonging to the same series of compounds. They are also analogous in composition to what Gmelin calls ethers of the third class, and acetate of the oxide of methyl, one of these bears a certain degree of analogy in its chemical constitution to fats and oils. Again, spermaceti is the cetylate of the oxide of cetyl, and the hydrated oxide of cetyl is considered by chemists to be closely allied to the alcohols, in fact a species of alcohol.

Dr. Winkler states that he has lately found that cod liver oil differs in composition from all other oils hitherto used in medicine in this respect, that when saponified with potash it does not yield glycerine, but oxide of propyle, a new body which exists in combination with the oleic and margaric acids, taking the place of the oxide of lipyl in other oils and fats. By means of oxide of lead this body may be separated in a higher state of oxidation as propylic acid. By means of ammonia it may likewise be converted into an alkaloid propylamine, which has also been obtained from ergot of rye, from herring brine, and from the destructive distillation of substances containing nitrogen. It thus appears that there is a sufficient difference in the chemical composition of cod liver oil to account for its superior efficacy, without attributing it to the accidental ingredients it contains. It has been thought not improbable that, in the ultimate decomposition of fat and oils in the animal economy, the fatty acids are first separated from the base, oxide of lipyl or oxide of propyle; and from margaric acid it is known that there is a descending series of fatty acids, each of which contains two atoms less of carbohydrogen than the one above it. As some of these acids are found in the animal economy, it is not improbable that the fatty acids are thus oxigenated by successive subtractions of a certain number of atoms of carbo-hydrogen, until finally reduced to carbonic acid and water; and that after having served various purposes in the nutrition and metamorphosis of the tissues, this portion of oils and fat is thus finally consumed, furnishing fuel for the support of the important function of respiration, and the maintenance of animal heat. With respect to the glycerine separated from the fatty acid, it has been thought by Dr. Lehmann, that it may be converted into lactic acid, which performs an important part in digestion and other processes, and is finally consumed in the process of respiration, for which purpose the alkaline lactates, by their affinity for oxygen, are peculiarly adapted. It would appear too that the oxide of propyle is readily oxidated so as to form propylic acid. Oils and fat unquestionably serve other important intermediate purposes in nutrition, as yet very imperfectly understood; and they are essential to the growth of cells as they form the nuclei; that they are however ultimately oxidated and consumed in the process of respiration, scarcely admits of doubt.

Lehmann asserts that there are no acute and but few chronic diseases in which there is not deficient oxidation, and if we consider how much of our treatment, in most diseases, consists in removing unhealthy secretions, most of which would not exist at all if the function of respiration were vigorously performed, we have much reason to believe that there is a great amount of truth in this

facts should not have been placed together, especially as other kinds of oil and fat had been known to have proved serviceable in consumption, and that thus the discovery should not have been sooner made of the applicability of cod liver oil to the treatment of tubercular disease.

view. This can be clearly shown to be true of gout, where deficient oxidation prevents the conversion of uric acid into urea, as well as of some other diseases. I am strongly disposed to think that deficient oxidation, that completing part of the process of digestion which takes place in the lungs, and consists of excretion as well as absorption, is one of the great causes of tubercular formations, which are more frequently deposited in these organs than in any other part of the body. Among the best known causes of tubercular phthisis, we find many of the conditions which lessen the activity of the respiratory function, such as—depressing passions, grief and anxiety of mind, sedentary employments, and above all confinement in prisons; whilst, on the other hand, active out-door exercise, a cheerful state of mind, and all those hygienic conditions which promote the free action of the atmosphere on the blood, tend to avert this disease. Let it not however be supposed that I consider deficient oxidation the sole cause, as there are facts in relation to other diseases which seem to show that it is not so. There is much reason however to believe that imperfect digestion, combined with deficient oxidation, or a want of uniformity in the action of oxygen on the blood, and through this fluid on the whole system, is the main cause. We should likewise observe, that in proportion as the breathing power of the lungs is impaired by tubercular disease, the tendency to further deposit is increased, so that the difficulty the physician has in combating the disease is continually increasing with its advance. Hence too the fact, that tubercular disease affecting the lungs is not only more common, but less curable, than when it occurs in any other organ.

Cod liver oil appears to improve the quality of the blood by increasing the red corpuscles which are supposed to convey the oxygen from the lungs to the tissues of the body:* by its attraction for oxygen it would appear to increase the energy of the respiratory function, furnishing hydro-carbonaceous fuel well suited for this

* Lehmann (Physiology, Chemistry, vol. ii., p. 105) advances the opinion that the chief function of the liver is the formation of the blood corpuscles; and it is worthy of notice that the blood of the vena porta entering the liver contains much fat, and that of the hepatic veins leaving it contains very little.

purpose, and thus, as well as by suppressing the purulent secretions, it would seem to promote a more uniform action of the oxygen on the blood and system. If this view of its action be correct, it should lead us to try the effect of other hydro-carbonaceous bodies, in the hope of discovering some that may be even more efficacious; and it should lead us to regulate the diet of consumptive patients with special reference to the function of respiration.

ON OTHER REMEDIES AND MODES OF TREATING SOME PULMONARY AND LARYNGEAL DISEASES.

The improvements effected of late years in the treatment of consumption having clearly shown that the disease is much more within the reach of medicine than was at one time supposed, and that even the cure of it is possible in some cases, the search after improved means of treatment is not only a legitimate subject of inquiry, but a duty which those medical men who have extensive opportunities of treating the disease, especially in hospital practice, should endeavour to fulfil. Holding this opinion, I have examined the properties of some remedies which had formerly a reputation in consumption, but have now fallen into disuse, in the hope that our improved position in reference to the treatment of this disease might enable us to discern more clearly their beneficial properties. I have also investigated some other methods of treatment not yet generally adopted by the profession. To these and other points of practical interest in reference to the treatment of consumption, as well as some other pulmonary diseases, I shall now direct attention as follows:

1st.—The use of some Pyrogenic remedies.

2nd.—The use of the alcoholic extract and the tincture of the seeds of the Œnanthe Phellandrium.

3rd.—The Topical application of solution of the nitrate of silver in Laryngeal diseases.

4th.—The employment of Inhalations in consumption and other pulmonary diseases.

5th.—Hygienic means of treatment, with reference more particularly to the use of Sugar of Milk and other articles of diet capable of furnishing carbonaceous fuel for respiration.

On the Use of some Pyrogenic Remedies.

My attention has been directed to the use of pyrogenic remedies in consumption by several circumstances. Tar water had formerly a great reputation as a remedy in this as well as other diseases, having, in 1744, been excessively commended by Bishop Berkley; but, though it afterwards fell into neglect, it has never been altogether lost sight of as a popular remedy. Creasote and naphtha, pyrogenic remedies obtained from tar, are known to have a very decided power of relieving several of the symptoms of this and of some other pulmonary diseases. I was also led to examine these remedies more particularly from the view which I have taken of the action of cod liver oil upon the function of respiration, and from knowing that the pyrogenic bodies are highly inflammable, having apparently been brought into a fit state for ready union with oxygen by exposure to a high temperature, with a limited supply of this agent. I may here observe that the process of destructive distillation, by which tar and the other pyrogenic bodies are produced, is a very interesting one, not merely to the chemist, but also to the physician, when we reflect that in the bodies of all living animals a process of oxigenation, or slow combustion, is at all times going forward, by which their heat is maintained and products are formed, not merely similar, but identical with some of those obtained by destructive distillation. It is not however for me, in a practical paper like this, to enter into the chemistry of this process. I shall only, therefore, now observe that tar, one of the chief products, is a very complex substance, containing more or less of most of the products of the distillation of wood. Of these, the chief are pyroligneous acid, some spirituous bodies, such as wood spirit, acetone, and acetate of the oxide of methyle; and creasote, picamar, capnomor, cedriret, pittacal, and pyroxanthine. These are chiefly ternary compounds, containing carbon, hydrogen, and oxygen; but there are others—paraffine, naphthaline, and eupion—which are binary, and contain the two former only. Some are soluble in water, such as pyroligneous acid and wood spirit; others, as creasote, are insoluble, or sparingly soluble; and a third set are solid, such as naphthaline and pyroxanthine.

In employing tar, therefore, as a remedy, we make use of a most complex substance, the effects of which must vary according to the proportions it may happen to contain of these various products of distillation. It would be most desirable that each should be fully investigated; but as yet creasote is the only one the properties of which are thoroughly known. The great difficulty of obtaining most of them in a pure state is undoubtedly one cause of their not having been examined, and it has prevented me from ascertaining the medicinal properties of several which I have found it impossible to procure. I shall first point out the properties of tar water, a remedy deserving of more attention than it has received of late years; after which I shall examine the properties of some other pyrogenic bodies, more particularly naphthaline, a remedy not hitherto used in consumption, but which I have found valuable in relieving the cough and promoting easy expectoration.

Tar Water.—The medicinal properties of tar water must be due chiefly to those ingredients of the tar which are soluble in water. These are pyroligneous acid and several bodies of a spirituous or ethereal nature, pyroxylic spirit, acetone, acetate of the oxide of methyle, and other allied bodies. It also contains creasote, the solubility of which in water is increased by the acid. Some of the other less soluble bodies are also probably suspended to some extent, or dissolved by the same agent, and impart to the fluid their properties, and its brownish yellow colour.

It appeared to me that tar water might, like many other useful remedies, have fallen into undeserved neglect, and that, used with the other means we now possess, and applied with the precision which improved means of diagnosis furnish, it might be found a useful addition to the present means of treatment. I accordingly made trial of it, and very soon found that it may be so used as to afford valuable assistance in combating some of the most trouble-

some symptoms of phthisis. During nearly two years I have given it in many cases in private as well as hospital practice; and I shall now state how it has been found to act, and in what cases it has proved beneficial.

It has been said that tar water is a stimulating remedy, which increases the action of the skin and kidneys. I have frequently found it produce a gently stimulating and tonic influence upon the whole system; and in many cases it has at the same time relieved the general febrile disturbance and other hectic symptoms. In some instances it acted very decidedly upon the kidneys. As an example, I may mention the case of a boy, about twelve years of age, who came under my care in a very advanced stage of consumption, and with general dropsy. In this case it improved the general health and strength, and acted very decidedly as a diuretic, so that the swelling was removed in the course of a few days. The stimulating action of tar upon the skin in cutaneous diseases is well known; and it has been thought that tar water promotes perspiration. It certainly exerts a decided influence upon the mucous and cutaneous surfaces; but in consumption I have often found it check the profuse night sweats of hectic fever. This property I have ascribed to the pyroligneous acid it contains, which is a remedy used extensively, both externally and internally, to check hectic perspirations. The mucous surfaces on which it acts are those of the lungs and stomach. By its action on the former, we not unfrequently find that expectoration, when it has been copious, is checked. Of all its effects however none are so important as that which it produces directly upon the stomach. In cases of consumption we very often find, more especially as the disease advances, a peculiar irritable condition of the stomach, which causes sickness and vomiting. It is often very difficult to overcome this form of dyspepsia; but it is most important that it should be removed, as the irritability of the stomach prevents the patient from taking a sufficient quantity of food, and also interferes seriously with the use of cod liver oil, the chief remedy for the primary disease. In this condition of the stomach, we find that it rises, producing unpleasant eructation, or causing sickness and loss of appetite. I have already adverted to some of the various means that have been used to overcome this irritability of the stomach; and I have now to observe that, in many cases, some of the pyrogenic remedies at once succeed in removing it, and none have appeared to me to succeed so well as tar water, which at the same time fulfils other important indications.

The four following cases illustrate the preceding observations:

Case 19.—Harrison, a tall young man, aged seventeen, was admitted into the Royal Infirmary, under my care, on the 2nd of October, 1851. He had all the usual symptoms of advanced consumption, as well as the physical signs of cavities at the upper part of both lungs. He was greatly emaciated, and extremely weak; and he had profuse expectoration and night sweats. I was unwilling to admit him, seeing but little prospect of being of service in so advanced a case, more especially as he had already taken cod liver oil for a considerable time, without any material benefit. At the urgent request however of his mother, I agreed to take him in for a short time, in order to make a trial of what could be done. He was again put under treatment with cod liver oil, and for eight days he took it without any apparent benefit, the appetite continuing very bad. I then ordered him to take half a pint of tar water daily, the oil being still continued. From this time he began to improve, the perspirations and expectoration diminished, and he slowly gained flesh and strength. The report on the 6th of November was as follows: "He has milk diet, chop, and three ounces of wine daily, and has made far greater progress than was expected from his weak state and the amount of disease. The gurgling at the upper part of both sides of the chest is much lessened. In the right side, there is dry blowing and pectoriloquy. In the left, there is still some mucous rale." He continued under my care about four months, part of the time as an out-patient, and then went to live with some friends in the neighbourhood of Belfast, where he resumed his employment as a tailor. In consequence of the benefit he had received, an uncle of his came from Belfast at the beginning of the succeeding winter, to place himself under my care, and from him I learned that the health of the nephew had continued to improve.

Case 20.—On the 17th of November, 1851, I saw, in consultation, a lady, aged forty, who had the usual symptoms of phthisis, with the physical signs of a cavity at the apex of the left lung, along with a degree of dulness on percussion, which indicated a very considerable amount of tubercular deposit. She was placed under the usual treatment, with counter-irritation, sedative expectorants, and cod liver oil, under which treatment she improved at first; but she afterwards became unable to take the oil; and when I was again called to see her, five weeks subsequently, I found that she had retrograded. She had become paler and thinner, and the perspirations were profuse. She had also become unable to take the oil. Some alteration was made in the expectorant mixture for the cough, and tar water was prescribed to be taken in conjunction with the oil. When I again saw her, towards the end of April, 1852, the change in her appearance was very remarkable: the disease was arrested; she had become stout as well as strong; the cough gave her very little annoyance; and she had hardly any expectoration, and no perspirations. The physical signs still showed the existence of the local disease, but in a state of abeyance.

I did not again see this lady till the 7th of March, 1853. I found that she had been confined of a healthy child seven weeks previous; and her chief object in consulting me was to know if I approved of her nursing the baby. This, I need scarcely say, I at once stopped, for her own sake, as well as that of the child, and placed her on a tonic plan of treatment. Since she has stopped nursing, the general health has improved, and at present she has no symptom of active tubercular disease, scarcely any cough or expectoration, no perspirations, a good appetite, and pulse 80. The physical signs indicate that the local disease has also improved, and the cavity has diminished in size. There is sinking below the left clavicle, a clearer sound on percussion, and dry cavernulous breathing. Upon the whole, I consider her condition very satisfactory, and look forward to further improvement under the influence of change of air, combined with hygienic and tonic treatment.

Case 21.—A woman, twenty-two years of age, who was not much emaciated, was admitted into the Royal Infirmary on the 15th of December, 1851, with cough, and having recently had a severe attack of spitting of blood. She had the usual symptoms of consumption,—hectic fever, very profuse night sweats, and abundant muco-purulent expectoration. At the apex of the left lung there was very decided dulness on percussion, and the signs of a cavity of considerable size. Cod liver oil and a sedative expectorant mixture were ordered for her. On the 22nd, she had not improved in any respect, and she complained of loss of appetite, and of sickness and vomiting after taking the oil. Half a pint of tar water was ordered to be taken daily. On the 26th there was already a marked improvement, there had been no sickness since taking the tar water, the appetite had become good, the tongue clean, and the perspirations and expectoration had both diminished. Under this treatment she continued to improve, the progress of the disease was arrested; and on the 19th of January she considered herself well, and wished to be discharged. She went out however contrary to my wish, as I knew that, where so much local disease existed, it was impossible that it could have undergone, in so short a time, an amount of improvement corresponding with what had been effected in the general symptoms, and that therefore there was reason to fear a relapse.

Case 22.—In December, 1851, I saw in consultation with Dr. Robertson, of Birkenhead, a lady about twenty-one years of age, who was in a very advanced stage of consumption, and had also fistula in ano. She was then so weak that she could scarcely stand; and she had profuse perspirations and copious purulent expectoration, also the physical signs of advanced tubercular disease in both lungs, and a cavity in the right. She had been visited by a physician who had come from London to see her, and Dr. Robertson had also endeavoured to induce her to take cod liver oil, but there was a very irritable condition of the stomach, and she had refused to take it. We prescribed tar water, which removed this state of the stomach, and at the same time checked some of the hectic symptoms. She was then enabled to bear the oil in small doses; a rapid improvement took place in her health, and towards the end of April she had improved remarkably in appearance, and had gained flesh and strength to a degree quite beyond the expectation of her friends. This patient removed from the neighbourhood, and when I

last heard of her, more than a year after my first visit to her, she was still tolerably well, but continued an invalid.

These cases are sufficient to show that much benefit may be derived from this remedy, even in some advanced cases, where it may be used so as to give the patient an impetus in the right direction, after which the advantage gained may be followed up by the use of other means. I am anxious however to produce no undue impression as to its beneficial properties, and I repeat therefore that I recommend it more particularly as a remedy for the treatment of those symptoms I have already mentioned,—viz., sickness and vomiting, with irritability of the stomach, so common in this disease, and which causes the oil to rise or be rejected, also for the purpose of checking, in some degree, profuse expectoration and night perspirations. Though I do not now claim for tar water any ulterior power in preventing or removing tubercular deposits, there are some facts which might seem to show that it may not be entirely devoid of such power. It has, for example, been found beneficial in scrofula too, and Dr. Copland, in the article in his Dictionary on this disease, strongly recommends tar and tar water externally, as well as internally, in the treatment of scrofula. As tubercular diseases are also so closely connected with mal-assimilation, it is possible that any remedy which exerts so decided an influence over the function of digestion may produce an effect upon the disease beyond what has now been attributed to tar water.

Creasote.—This is a valuable medicine which undoubtedly possesses some of the properties of tar in a concentrated form. It has an anodyne action, examplified in its power of relieving toothache and neuralgic pain of the stomach. In common with several other pyrogenic bodies it has a remarkable power of stopping vomiting and sickness. It exerts a stimulating and astringent action on the cutaneous and mucous surfaces, and in many diseases of the skin it has healing properties similar to those of tar. In many pulmonary diseases it is a very valuable remedy. In cases of consumption it frequently relieves the cough, promotes easy expectoration, and lessens the quantity of this discharge. I believe that it produces these effects chiefly by its action on the mucous membrane, for in cases of chronic bronchitis I frequently find it equally efficacious. In gangrene of the lung, in chronic pneumonia, and in phthisis with fetid expectoration, its antiseptic and astringent properties render it peculiarly valuable, and it may be inhaled as well as taken internally. In the diarrhœa of consumption it is also known to be a useful remedy, especially when combined with the metallic astringents. The action of creasote, in these and other diseases, is so well known that I need not enter further into its properties than I have now done, for the purpose of showing that it possesses some which are common to it and other pyrogenic bodies.

Pyroxylic Spirit, Acetone, Acetate of Oxide of Methyle.—The medicinal naphtha which at one time obtained a reputation as a remedy in consumption, is usually a mixture of these three spirituous compounds, obtained from the distillation of wood. It is now known that naphtha has no curative power over this disease, but I may observe that I occasionally meet with cases where it is decidedly useful in relieving cough, checking profuse expectoration, and stopping sickness. For these purposes however, I more commonly use tar water or creasote, as I have found them less apt to produce injurious stimulating effects. It appeared to me not unlikely that there might be a difference in the properties of acetone, acetate of the oxide of methyle, and pyroxylic spirit, and I therefore made some trials of each of them separately, but I did not find that there was any material difference in their effects. In a case of emphysema, with bronchitis and copious serous expectoration, I lately used the pyroxylic spirit with very good effect. It relieved the cough and difficulty of breathing, and reduced the discharge from the lungs. I believe that the action of each of these spirituous compounds is exerted chiefly upon the mucous membrane of the bronchial tubes, and of the stomach.

Naphthaline.—We have seen that the properties of tar water must be derived from the more soluble pyrogenic bodies. Being satisfied that they possessed useful properties in consumption and other pulmonary affections, I resolved to make trial of some of the less soluble pyrogenic compounds. Naphthaline, which is the most easily procured, is a white crystalline substance, having a strong

odour, but not much taste. It is a pure hydro-carbon, consisting of twenty equivalents of carbon and eight of hydrogen; and it has been found in all kinds of tar, but most abundantly in coal tar, from the distillation of this product being conducted at a high temperature.

My experience of naphthaline as a remedy has been confined chiefly to cases of consumption. I find that taken in the dose of from three to ten grains thrice a-day, it generally relieves the cough, and causes easy expectoration, and at the same time it not unfrequently diminishes the quantity. When there has been difficulty of breathing, it has often relieved this symptom too. I have particularly noted its effects in fifteen cases of consumption. In three no marked effect was produced upon the cough or pectoral symptoms. In ten cases it was relieved; in four the breathing was relieved; in three the expectoration was rendered easier; and in three it was diminished in quantity. In three the appetite was improved decidedly. Also, in two cases of chronic bronchitis, it acted as an expectorant; and in a case of chronic pneumonia, probably of tubercular nature, the expectoration was rendered easier, and the quantity diminished. When I first made use of naphthaline I believed that it had not been employed in medicine except as an external application in diseases of the skin. In looking through the appendix of the United States Dispensary, I have since however found that it had previously been used as an expectorant in chronic bronchitis. "It has," observe the editors of that work, "been proposed by Dupasquier as an expectorant, and has been found on trial to act decidedly as such. In the impending suffocation occurring in the chronic pulmonary catarrh of old persons, and in humoral asthma, it facilitates expectoration in a remarkable degree. Being a stimulating remedy, it is not proper in acute bronchitis, or where pulmonary inflammation exists." These observations as to its effects as an expectorant in chronic bronchitis and asthma, tend strongly to confirm the correctness of what I have advanced as to its beneficial effects in cases of consumption.

There are many other pyrogenic bodies, which can only be obtained with great difficulty in a pure state. As yet scarcely anything is known of their properties; but, as the preceding observations show that this class of hydro-carbons exercise an important influence upon the lungs, and probably also on their excreting functions, it is most desirable that more should be known of the effects of these and other hydro-carbons. It may not be unworthy of notice here, that many of our expectorant remedies, such as camphor, the balsams, gum resins, and essential oils, are chiefly hydro-carbons; and in reference to naphthaline it may be observed, that with chlorine, iodine, nitrous acid, and other bodies, it forms a variety of substitution compounds by giving up a certain number of atoms of hydrogen, a fact which would dispose us to believe that it might undergo similar changes in the animal economy. Through the kindness of Mr. Scanlan, the discoverer of pyroxanthine, I procured a small quantity of this pyrogenic substance. It is a crystalline solid of an orange yellow colour, and is obtained from crude pyroligneous acid. It has a slightly bitter taste; but I have not been able to discover that it exerts any decided action on the animal economy.

On the Use of the Alcoholic Extract and the Tincture of the Seeds of the Œnanthe Phellandrium.

The plants which belong to the natural order of umbelliferæ furnish many of our most valuable medicines, as well as some of our most virulent poisons. The conium, so much used in the treatment of consumption, scrofula, and various other diseases, is an example. There is another indigenous plant belonging to the same natural order, the œnanthe phellandrium, or phellandrium aquaticum, which has long had a popular reputation as a remedy in consumption and other diseases; though I am not aware of it being used by the profession in this country, at least in the present day. This may be owing to the fact that the virtues of the remedy are very imperfectly obtained in the ordinary mode of giving it in the form of powdered seeds. The plant belongs to the same genus as the œnanthe crocata,

which is known to be a powerful narcotic poison; but in the phellandrium, the narcotic principle is so much weaker that the seeds may be safely used, their narcotic power being so slight that they produce merely an anodyne effect upon the cough, whilst the essential oil and the resin, which they also contain, give them their valuable expectorant properties.

Having found the tincture, and also the alcoholic extract made from the seeds of this plant, of great service in relieving the cough and other pectoral symptoms in almost every case of consumption in which I have prescribed them, I wish to direct the attention of the profession to their medicinal properties, feeling assured that they will be found a valuable addition to our ordinary means of treating this disease. On referring to Dr. Woodville's Medical Botany, I find it stated that the seeds, when taken in large doses, produce a remarkable sensation of weight in the head, accompanied with giddiness, intoxication, &c.; and that, therefore, they may be deemed capable of proving an active medicine; also that, distilled with water, they yield an essential oil of a pale yellow colour, and of a strong penetrating smell; and that one pound of the seeds affords nearly two ounces of spirituous extract, of which nearly three drams consist of resin. He also quotes some ancient authorities to prove their good effects in several diseases, more particularly those of the bladder, also in asthma and consumption. Stephenson and Churchill, in their work on Medical Botany, make the following observations on their properties and uses: "The seeds of phellandrium aquaticum are carminative, narcotic, and diuretic. They have been much recommended on the continent in pulmonary consumption; and many cases are recorded in which the disease, if not cured, was evidently relieved by them." Also, "The seeds were employed by the ancients in calculous complaints; and have been highly extolled by Heister, Ernsling, and others among the moderns, as possessing valuable diuretic, antiseptic, and expectorant properties." Sir Alexander Crichton, in his work on consumption, strongly recommended the seeds in the dose of from a scruple to a dram to relieve the cough in this disease. My first trials of the remedy were made with the powdered seeds, given as he had recommended. When used in this way, I found so little effect from them that I was at first disposed to think that their virtues had been exaggerated; and it was only after giving a strong tincture prepared from the seeds that I became convinced of their efficay. I have since used an alcoholic extract,* which may be given in the form of a pill, and is more suitable than the tincture in those cases where we wish to avoid the stimulating effects of the rectified spirit, with which it is necessary that the tincture should be prepared.

In examining my notes of cases, I find that the effects of the tincture, and of the extract of phellandrium, have been carefully observed and recorded in ten cases of consumption under my care in the Royal Infirmary. It was given only in those where the cough was complained of as being troublesome, in all of them it was more or less decidedly relieved, and in some, more than by any medicine which had been previously given. In almost all the cases the expectoration was rendered easier, and the quantity was in several materially lessened, as occurs not unfrequently where other resinous or balsamic expectorants are taken. In some instances the patients, after using the phellandrium, slept better at night; but, beyond this, I have not been able to observe any narcotic effect. In a case of emphysema of the lungs, with chronic bronchitis, I also used the phellandrium with advantage.

My experience then of the phellandrium gives me confidence in recommending it as a safe and valuable remedy, deserving of more attention in the treatment of consumption than it has hitherto received; and I feel also satisfied that the tincture and alcoholic extract are preparations by which we are enabled to obtain from them, with more certainty and power, the whole of their beneficial properties.

* I am indebted to J. B. Edwards, Ph.D., Chemist, Berry-street, Liverpool, for the preparation of this extract.

On the Topical Application of Solution of the Nitrate of Silver in Laryngeal Diseases.

Many local diseases, it is well known, have a constitutional origin, and, unless it admits of removal, we find it impossible to cure the local affection permanently. This observation applies to the treatment of consumption, and likewise to that of all external scrofulous diseases; and, in these and many other constitutional affections, our chief attention must therefore be directed to the essential cause. In many external scrofulous diseases, however, whilst we employ means to act upon the constitutional state, we find the greatest benefit from the use of local remedies also. As an example, I may mention lupus, a scrofulous disease of the nose and face, where, by the use of local means, combined with suitable constitutional remedies, we often succeed in permanently curing a most obstinate form of scrofula, which would certainly resist either means of treatment adopted singly.

I believe that in pulmonary diseases the direct application of remedies has not yet received all the attention it deserves. In this section I shall point out the advantages that result from the use of local applications in laryngeal diseases affecting the voice, and in the succeeding I shall endeavour to show that we may reasonably expect to derive material benefit from the inhalation of volatile remedial agents. It may perhaps be said that we cannot as yet point to any very satisfactory advantages derived from the latter mode of treatment; but this is no sufficient reason for thinking that more extended researches will not yield better results, and, until very recently, the same objection might have been applied to the former topical mode of treatment to which I have in this section to direct attention.

The direct application of remedies to the seat of disease in affections of the larynx and glottis, is a method of treatment which was frequently tried with partial success some years ago. It is only however within a recent period that it has been clearly proved, that this mode of treatment can be used with perfect safety in many cases of consumption, complicated with inflammation or ulceration of the larynx, causing hoarseness, loss of voice, and sometimes difficulty of swallowing; and that, in certain cases of obstinate chronic cough and asthma arising from simple or follicular laryngitis, it may be used with complete success. Several practical writers have lately recommended this mode of treatment very strongly; but, as it is an improvement which has not yet been generally adopted by the profession, I shall now detail the results of my experience of it as briefly as possible.

It would seem that the merit of first applying a solution of the nitrate of silver to the glottis by means of a sponge, is due to the late Sir Charles Bell, who, in his "Institutes of Surgery," observes—"I long since, in hospital reports, recommended the solution of nitrate of silver to be squeezed into the glottis, by means of a piece of sponge attached to a catheter wire. The late Mr. Vance adopted the practice." An American physician, Dr. Horace Green, has extended this method of treatment, and shown that the sponge may be introduced into the larynx and trachea with great advantage. Soon after this mode of treatment began to be again used in this country, it appeared to me that all the advantages of it might be more easily gained by injecting a solution of the nitrate of silver, by which means either the larynx or fauces might be washed with the fluid. I therefore got an instrument made similar to the syringe which has since been recommended by Dr. T. Thompson, and I have found very decided benefit in many cases of chronic laryngeal inflammation and ulceration, by injecting the fauces and glottis, and in some instances the larynx, with a solution of the nitrate of silver, the strength of which has been made to vary from one to two scruples to the ounce of distilled water.

Chronic inflammation of the larynx and windpipe may be a simple disease independent of any other, this form being the most readily curable. In other cases it is of syphilitic nature, but in a larger proportion of cases it is a scrofulous disease, and generally exists in conjunction with tubercular disease of the lungs.

Simple chronic inflammation of the mucous membrane of the larynx attacks more particularly the mucous follicles or crypts, which are so abundant in the parts of the fauces round the glottis, and in the larynx. These follicles secrete the lubricating fluid which protects the glottis and larynx from the irritating action of the atmosphere; and inflammation of these follicles must excite irritation directly, as well as by vitiating the secretion and depriving the parts of this natural protective fluid. It has been called *Follicular laryngitis*, and often arises from colds attacking the tonsils, the uvula, the fauces, and the back of the pharynx, from which parts the inflammation extends downwards into the larynx. Dr. Todd says that it is apt to occur in persons of gouty habit, and in women of relaxed habit, who do not take proper care of the general health. It is probable that it is always more or less connected with dyspeptic or some other derangement of the health, which prevents the catarrhal inflammation from subsiding in the usual way; and hence, in this, as well as all other laryngeal affections, for which I have to recommend the use of local treatment, the state of the general health, with a view to the removal of any constitutional cause, must never be overlooked. Follicular laryngitis has been known to occur in persons long subjected to the inhalation of irritating particles of dust. It is also a frequent disease in persons who are obliged to make great exertions of the voice; and hence public speakers, clergymen, and teachers are subject to this form of laryngeal disease, which causes hoarseness, and occasionally in the advanced stage, when neglected, complete loss of voice. It is attended with dry cough of a scraping, clearing description, but, after a violent effort, little rounded pieces of tenacious mucus are sometimes brought up. The cough is increased by exposure to cold, by changes in the weather, and, when there is relaxation of the uvula, it is often troublesome on lying down. It is often considered as bronchitis, and treated as such; but the expectorant medicines which afford relief in this disease fail in removing the cough and irritation which arises from follicular laryngitis.

The seat and nature of the disease must be ascertained by examining the throat and fauces. This is to be done by depressing the tongue with the instrument commonly used for this purpose, so as to obtain a complete view of the fauces, the uvula, the top of the pharynx, and the epiglottis. These parts will be found more or less red, swollen, and congested. The follicles may also be seen prominent, enlarged, and red; and the uvula is frequently elongated, occasioning an irritating cough, and frequent desire to swallow. The finger may also be used to ascertain if there be any irregularity of the surface of the epiglottis which might indicate ulceration, or any swelling and stiffness which may interfere with its valvular action and cause pain and difficulty of swallowing. Auscultation of the larynx has also been used, by which means occasional rales may be detected, and a dry harsh metallic tone of the respiration. Beyond this, however, it does not seem to furnish any evidence of much value.

Several of the most recent writers on laryngeal diseases, have pointed out that this affection of the larynx is a frequent cause of those intractable coughs which do not yield to ordinary treatment. In some too it is a cause of asthma, of which Dr. Eben Watson* has published an interesting case. Follicular laryngitis also sometimes occasions spitting of blood, which is apt to be regarded as coming from the lungs, and therefore as a symptom of consumption. The following is a case of follicular laryngitis, where there was complete loss of voice, and also cough with spitting of blood, which would certainly have been regarded as proceeding from the lungs, and a symptom of tubercular disease, if the precaution had not been taken of examining carefully the parts about the opening of the glottis.

Case 23.—Julias Myers, a German cigar maker, aged 39, was admitted into the Royal Infirmary, on the 28th March, with complete loss of voice, so that he could only speak in a whisper, and dry harsh laryngeal cough. These symptoms had commenced three weeks previous, and since then he had occasionally brought up a small quantity of pure blood with the cough. He was pale, but rather muscular, and not emaciated. He was of scrofulous habit,

* On Laryngeal Disease. *Dublin Quarterly Journal*, Nov., 1850, page 342.

having had lupus of the nose four years before. His habits were not temperate, and he had enlargement of the liver. At first I believed, seeing that his constitution was scrofulous, that the chief disease would be found in the lungs, and that the laryngeal affection was merely a complication; but, on examining the chest, I was unable to discover any dulness or other physical sign of disease. On inspecting the fauces however, I found the mucous membrane of a dark red colour, and the velum uvula and epiglottis much inflamed. Behind the velum, at the top of the pharynx, I saw distinctly a dark clot of blood, showing that this, and not the lungs, was the source of the spitting of blood. The solution of the nitrate of silver was injected behind the velum, and into the glottis, three times. After each application there was a decided improvement in the voice. On the 2nd of April he had quite recovered his voice, though it was still rather hoarse, the redness was nearly gone, and he wished to go out and return to work.

Phthisical Laryngitis.—There are cases of consumption which commence with hoarseness, and dry or stridulous cough, evidently produced by laryngeal inflammation. In some of these cases the laryngeal affection is probably the cause of the pulmonary disease, as we know that affections of the glottis and larynx tend to creep inwards to the trachea and lungs. In others it is probable that tubercles have already begun to form as soon as the laryngeal affection shows itself. But, whether this be so or not, the laryngeal disease exercises an injurious influence upon the lungs; and therefore, in conjunction with general treatment, appropriate local means should always be employed to remove the laryngeal complication. In the majority of cases of phthisical laryngitis however, where we have the symptoms of an advanced state of laryngeal disease indicated by purulent expectoration occasionally bloody, by prolonged difficult inspiration, stridulous hissing cough, difficulty of swallowing, and complete loss of voice, the disease of the lungs will be found to be in an advanced stage. Such a condition of the larynx so obscures the ordinary signs that it is often difficult to ascertain the exact state of the lungs by auscultation.

In some of these cases, where there could be no doubt of the existence of ulceration of the larynx, and probably of the epiglottis, I have used the injection of the nitrate of silver to the fauces, and sometimes into the larynx, with great benefit. At first there is spasm and severe cough when it enters the larynx. Afterwards the cough and breathing have generally been relieved, the patient has swallowed more comfortably, and the voice has been more or less restored. In most of such advanced cases, the relief must necessarily however be but temporary, the ultimate result being dependent upon the condition of the lungs. Dr. Bennett observes however, that the local treatment may not only remove or alleviate the laryngeal complication, but that, in conjunction with general remedies, it tends in a marked manner to induce arrestment of the pulmonary disease. The following case illustrates the beneficial effects of local treatment on the laryngeal, as well as the pulmonary, disease.

Case 24.—George H., a ship carpenter, aged fifty-two, was admitted into the Royal Infirmary on the 27th of January, 1853. He was weak and emaciated, and he had much difficulty in breathing, and considerable lividity of the face. He had a harsh stridulous cough, pain in swallowing, and the voice was so hoarse that he could only speak in a whisper. He had chills, but no night sweats, and he expectorated a considerable quantity of thick muco-purulent matter. His illness had commenced with spitting of blood eighteen months previous, since which he had got gradually worse. The sound on percussion seemed less clear than natural below both clavicles, especially the right, on which side there was moist subcrepitant rale, obscured in some measure by the affection of the larynx. Over the larynx, respiration was dry and harsh, and though a slight sibilant rale was heard on a subsequent occasion, none was audible at that time. A pectoral mixture and cod liver oil were prescribed for him. On the 4th of February the throat and fauces were carefully examined, and it was found that they were much inflamed, the mucous membrane being of a very dark red colour. The parts around the glottis were injected with a solution of nitrate of silver of the strength of half a dram to the ounce. It caused much coughing and a burning sensation at the time, but the next day he felt relieved. The report on the 12th was,—"The

solution has been applied every day, or second day. He has now no uneasiness in the larynx, and he has some voice, which is however very hoarse. The general health and strength keep pace with this improvement, and he gains flesh." On the 17th, though the general health was still improving, he had taken cold in the throat, and the voice was again more hoarse. The redness of the fauces was also found to have increased. The solution was applied, and an embrocation with croton oil rubbed externally upon the larynx. The same treatment was continued, the solution being applied at longer intervals during the remainder of the month of February, and he steadily gained flesh and strength, the voice also improving. On the 3rd of March he was quite free from pain in the larynx in speaking or swallowing. He had very little cough or expectoration, and he felt his general health so good that he wished to go out. As the voice was still however hoarse, I injected a stronger solution, made with two scruples to the ounce, completely and effectually into the larynx. It produced cough and spasm, and burning sensation in the larynx. On the 5th of March he had no difficulty in swallowing, he could breath with great freedom, and his voice was strong, though hoarse. He had become very much stouter and stronger, and was altogether much pleased with the change in his condition. The state of the lungs had also undergone much improvement, and there was a diminution of the dulness and subcrepitant rale below the right clavicle.

On the 7th of March he was made an out-patient; and since then he has come once to the Infirmary to return thanks for the benefit he had received, and to state that he intended to resume his employment, which he had no expectation when he entered the Infirmary of ever being able to do again.

My object in the preceding observations having been to direct attention to the topical mode of treatment merely, I have not spoken of other ordinary means, such as counter-irritation. These however I do not undervalue; and I would observe that, as the larynx is the organ of voice, silence is sometimes important, in order to avoid irritating the part affected. Topical treatment will, I believe, in these cases afford more relief, temporary or permanent, according to the nature of the case, than any general means; but even in those not complicated with pulmonary disease there is often some derangement of the general health, so that local treatment should be employed not altogether as a substitute for general treatment, but rather as an adjunct. If gouty derangement were found to exist, the digestive organs would require to be attended to; and, in females with irregular menstruation, the uterine functions should be regulated by appropriate means.

On the Employment of Inhalations in Consumption and other Pulmonary Diseases.

The facts which have been brought forward with reference to the beneficial effects gained by combining local with constitutional means in the treatment of laryngeal diseases, would lead us to expect similar advantages from the direct application by inhalation of volatile remedies to the seat of the disease in pulmonary affections. It can scarcely however be said that we have as yet derived an equal advantage from the use of inhalations; and it may be asked how it is that a mode of treatment, which has been used more or less from the earliest periods, has not furnished more definite and useful results; and that, notwithstanding the discovery of a new class of remedies—the anæsthetic, such as ether and chloroform—this mode of treatment may still be said to be in its infancy. One reason may perhaps be that the investigation is a difficult matter, and would require to be made thoroughly on a large scale in order to furnish definite results. It is an easier matter for a medical man to prescribe a medicine than to superintend the inhalation of remedies. I believe too that our knowledge of the subject has not advanced as much as it might have done, because many who use inhalations prescribe them without any well defined object beyond the soothing effect, which may often be attributed rather to the watery vapour

than to the medicinal agent; and Dr. Snow has shown that some used for this purpose, such as extract of hyoscyamus, are incapable of being volatilized, and cannot therefore have any effect at all. There are however a great variety of volatile agents capable of being used for inhalation, which have never been tried at all; and, as organic chemistry is constantly adding to their number, there can be little doubt that this is a mode of treatment from which we may yet expect to derive a considerable amount of assistance in the treatment of pulmonary diseases.

My own researches on the use of inhalations being at present incomplete, I should not now have touched upon the subject were it not to direct attention to a mode of treatment which seems to me to be somewhat neglected. I shall examine it therefore rather with the view of ascertaining what is the actual state of our knowledge of this mode of treatment, and how far we may reasonably expect to derive benefit from the use of inhalations, than for the purpose of stating the results of my own observations.

When volatile remedies are inhaled, they must produce, besides the general effect resulting from absorption, as occurs with chloroform, a local action on the mucous membrane and its secretions, and hence we should expect them to exert an influence in bronchitis, especially the chronic forms. They must also produce a direct action upon the nerves which supply the mucous membrane, and through them upon the muscular fibres of the bronchial tubes. This would lead us to expect that inhalation of antispasmodic remedies would prove beneficial in spasmodic asthma, a deduction which is confirmed by the results of experience. Some remedies, such as iodine, must, when inhaled, act more directly upon the tissue of the lung itself than when taken internally, and hence it was thought that they might promote absorption of tubercles of the lungs. But experience has not confirmed this view; and, when we consider that tubercle is the result of a constitutional disease, there does not appear to be any good ground to expect advantage, until at least the constitutional tendency to deposition has been arrested or removed. There is still another very common morbid condition of the lungs, upon which the inhalation of volatile agents must act directly, viz., ulcerated cavities resulting from tubercular disease. In these cases it would be a vain hope to expect any lasting good from mere local treatment; but, in conjunction with such treatment as suspends or removes the constitutional disease, it is reasonable to expect benefit from such means. I have never therefore used inhalations in those cases where cavities were present in the lungs, except in conjunction with other means, to arrest the disease, and seldom until some decided progress had been made. I conceive however that in many cases where the health has been restored by the use of the means which recent improvements have placed in our hands, when the patient has become stout and often apparently well, but has still an open cavity in the lung, it is quite possible that local means may be used with advantage. In such a condition, we know that, even after the cavity has contracted, and the process of healing is advancing, the ulcerated surface is liable to become inflamed from exposure to the weather and various other exciting causes; that the unprotected vessels often allow blood to escape, causing hæmoptysis; and that there is always more or less purulent secretion, which weakens the system and reacts upon the constitutional tendency to tubercular disease. There can be no doubt that the want of power to complete the healing of cavities, even after considerable progress has been made, is one reason that patients so often relapse after they have regained an appearance of health. Without overlooking the fact that tubercles generally exist in other parts of the lungs, I consider that the discovery of means which would promote the cicatrization of cavities in these cases of arrested phthisis is a desideratum and a legitimate object of inquiry. Any means which would promote this object would certainly tend to advance still further the treatment of consumption.

Dr. Snow has shown in a paper on the inhalation of various medicinal substances, that some must be inhaled with the aid of heat, such as opium, morphia, extract of stramonium, and the gum resins; others with the vapour of water, such as iodine, camphor, and creasote; and a third class of substances, such as hydrocyanic acid, ammonia, and chlorine, at the ordinary temperature. Mead, in his day, recommended fumigations with the balsams in phthisical

cases; and Dr. A. T. Thomson, (Cyclopædia of Medicine, Art. Expectorants,) has stated that he has seen much benefit from them when inhaled in spasmodic asthma, in shortening the paroxysm and promoting expectoration. Dr. Snow found that ammoniacum gives off a fragrant, rather pungent odour, which can be inhaled very well by most persons. He also found inhalation of the watery extract of opium serviceable in relieving the cough, but that morphia was the most pleasant and suitable preparation of opium for inhalation. Extract of stramonium afforded more or less relief in five or six cases of asthma. He tried iodine in eighteen cases of consumption at the Brompton Hospital; in ten of them it was continued for more than a month; and the conclusion to which he came was, that no benefit could be observed to follow its use. Oil of turpentine appeared to relieve the cough in a few cases, and likewise camphor. He used the volatile alkaloid conia in the quantity of one minim diluted with nine of spirit; the cough was usually relieved, and in two or three cases the breathing also. It would therefore seem from its volatility, at the ordinary temperature, to be a remedy peculiarly suitable for inhalation, if it could be obtained more easily. Dr. Snow also found great relief produced in a few cases of bronchitis with difficult expectoration, from inhaling ammonia, twenty drops of the strong solution being mixed with two ounces of water in a Woulfe's bottle. Chlorine has been much used for inhalation. It was introduced for this purpose in France, and there seems to be good reason to believe that it has proved of material service in cases of chronic bronchitis, and even in some of phthisis. With reference to its use in the latter disease, Sir James Clark has observed, "We have tried it in many instances, and it has in several apparently suspended the progress of the disease." He also states, that it relieved dyspnœa and cough in some cases, though in the majority it produced no amelioration. Dr. A. T. Thomson has likewise stated, that in cases of asthma the relief it produced was very striking, and that in phthisis he had observed the hectic symptoms abate.

Of the various remedies now mentioned, it is probable that the gum resins and balsams, camphor, conia and chlorine, are the most suitable and useful for inhalation; but it does not appear that, by inhalation of opium or morphia, any very decided advantage has been gained over the more ordinary mode of exhibiting them.

The vapour of tar was formerly recommended for inhalation, and few medicines have been more used for this purpose than creasote. Sir Alexander Crichton, in 1823, strongly recommended tar vapour in consumption; but Dr. Forbes, in a report of cases in which he had tried it, published in the *Medical and Physical Journal*, stated that he had found it injurious in this disease, though of service in some cases of chronic bronchitis. He appears, however, to have used it in cases so far advanced, that no benefit could reasonably have been expected from its employment. Creasote has now superseded the use of tar vapour, which does not, from its irritating properties, seem well suited for inhalation, though there can be very little doubt, when we consider the healing power which it has as an external application, that it must exert a similar effect upon the lungs, if it could be used in such a form as to obtain its beneficial influence apart from its irritating properties. Creasote is, perhaps, more generally used by the profession for the purpose of inhalation than any other remedy; and I believe that when sufficiently diluted with the vapour of water it is one of the most useful. I have found that it has a sedative influence, relieving cough and promoting expectoration, whilst it at the same time not unfrequently lessens the quantity of this secretion both in consumption and bronchitis.

I have already observed that the pyrogenic bodies act upon the mucous and cutaneous surfaces; and my attention has been directed to other bodies of this class by the fact that many of them have remarkable healing properties when applied to ulcers and chronic cutaneous eruptions, a fact which leads me to expect that this class of bodies may, when fully investigated, furnish a suitable remedy for promoting the healing of pulmonary ulcers, and thus supply the desideratum to which I have previously alluded. Many of the pyrogenic bodies possess such healing properties in cutaneous diseases in a greater or less degree. From my own experience, I know that ointments made with tar, creasote, spirit of tar, juniper tar oil, and naphthaline, each have such properties, and are valuable remedies in the treatment of skin diseases.

The inference drawn from these facts, has led me to use for inhalation, some other pyrogenic bodies, viz., spirit of tar, juniper tar oil, Persian naphtha, and eupion. The spirit of tar possesses the healing virtues of tar, without its irritating effects, so much so, that I think it might advantageously supersede the crude substance, as an external remedy. It is more readily volatilized than creasote; and, when inhaled, it produces generally a mild, stimulating, and often rather a soothing effect upon the lungs. In some instances, however, it has appeared to increase the cough and expectoration, and it is not, therefore, suited for cases of bronchitis until inflammatory action has been subdued completely, or for cases of consumption until progress has been made in arresting the disease. Without wishing to speak confidently of the remedy, I may state that it has appeared useful in some cases of the latter disease, in conjunction with other treatment. Juniper tar oil (oleum cadinum), which is a valuable remedy in skin diseases, and much used on the continent, is less volatile than spirit of tar, and it is more irritating when inhaled. Persian naphtha and eupion possess decided anæsthetic properties: the former, when inhaled along with the vapour of water, has in some instances relieved difficulty of breathing in a very remarkable and decided way; and this fact renders it worthy of trial in spasmodic asthma. Eupion has decided sedative properties, it has relieved cough and difficult breathing, and patients have slept after using it; but it is not a pleasant remedy to inhale, and it has not unfrequently produced sickness afterwards, so that I should not recommend it to be used for this purpose.

I have used several of the essential oils for the purpose of inhalation. Many of them possess decided antispasmodic properties; and I have found that they have a remarkable power of relieving difficulty of breathing, a property which renders them peculiarly suitable for the treatment of spasmodic asthma. The oil should be dissolved in spirit, and inhaled with the vapour of water, so as to dilute its stimulating properties. The oils of cubebs, turpentine, and copaiva, which are pure hydro-carbons, are mild in their action, and produce very little stimulating effect. The oxigenated oils which I have used appeared to be more stimulating in their action on the air tubes; and some of them have stronger antispasmodic and expectorant properties. The oils of anise seeds and of peppermint are very stimulating, and in general cause too much irritation. Oil of spearmint is milder and antispasmodic, relieving difficulty of breathing in asthma, and even in phthisis. Oil of fennel is also mild. The oil of origanum is moderately stimulating and expectorant. I have also used the oils of rosemary and pimenta, which have similar properties. The hydruret of benzoyle, which is the bitter almond oil deprived of its prussic acid, (and closely connected with gum benzoin, becoming benzoic acid in a higher state of oxidation), is very irritating and much too stimulating for inhalation.

Chloroform is a remedy which has been much used by some medical men for the purpose of inhalation, not only in asthma, but in a small quantity in consumption, in order to relieve irritable cough. In some cases, I have dissolved the essential oils in chloroform, and given them in this way for inhalation, their volatility being so much increased that they may thus be given on a handkerchief, as chloroform is usually administered.

On Hygienic Means of Treatment, and the Use of Sugar of Milk as an Article of Diet.

There is scarcely any part of the treatment of consumption more important than the hygienic. It embraces the removal or avoidance as far as possible of the known causes of the disease, as well as the observance of every rule relating to diet, exercise, sleep, clothing, change of air or climate, the state of the secretions, and the habits of mind and body, which directly influence the health, and indirectly act upon the constitutional tendency. If rules relating to these points are of the highest importance for the prevention of the disease, and if the neglect of them tends to produce it, in those merely predisposed, it is obvious how much more inattention to

them must tend to reproduce it, in those who have once been affected, but in whom the disease has been arrested. I would observe, however, that hygienic means of treatment may be fully carried out in those who show merely the constitutional tendency, without evident signs of local disease. Such persons may be made to take much active exercise in the open air, and may be sent for change, to the climate most likely to invigorate the system; but when local disease has manifested itself, we are too often obliged to sacrifice part of the hygienic treatment. Thus it may become necessary, in consequence of the irritability of the lungs, to select a warm relaxing climate, and to confine the patient in-doors, and in winter to a warm room, a direct benefit being in this way often gained at the expense of some indirect injury produced upon the constitutional state. The indirect injury of such means should not however be overlooked.

It has been ascertained that consumption is a very common disease among the resident inhabitants of many of those places to which invalids from this country frequently resort. This shows that the advantage derived, is dependent more upon the excitement of travelling, and the change of habits and scene, than upon any curative power of climate. The selection of a suitable climate is a subject which could not be briefly touched upon with advantage; I shall only, therefore, observe that the change to more distant places is adapted chiefly to those in whom tubercular disease is in an early stage, or very perfectly arrested, and that most of the advantages of change, may be more safely attained by more delicate invalids, in removing from one part of this country to another. There is scarcely any point, in reference to the treatment of this disease, on which the medical man is called to give an opinion, of greater importance to the comfort of the patient, than that of change of climate; and I believe, that much injury is often done by the removal of patients, who would have been better at home. In deciding, whether a change should be made, and what change would be advisable, there are many points which should be carefully considered—the condition of the patient; the stage and extent of the local disease; the period of the year; and the effects of previous treatment. When the disease has been arrested, a change of air and climate will often stimulate the constitutional powers, and enable them to carry forward the improvement, after the remedial means by which it had been accomplished, have ceased to be of further service. On the other hand, where there is much disorganization of one or of both lungs, and the disease appears still to be advancing, so that the patient must necessarily during winter keep chiefly in the house, the comforts of home and the society of friends will be often found more valuable than a change to a slightly milder climate. In those advanced cases, where there is reason to believe that the disease will steadily advance in spite of any treatment, the patient should not on any account be removed from home.

I was consulted in September, 1850, by a gentleman who was passing through this town on his way to Torquay. I found the lungs extensively disorganized, and the disease advancing so rapidly that there was scarcely any chance of his living over the winter. He anticipated great benefit from a change to the south of England; but I was so impressed with the superior advantages of home comforts that I recommended him to return to Dublin. This he at last agreed to do; but his physician there appeared to take a different view of his case, and allowed him to go to Queenstown, where he died very soon after. In all such cases, where the disease is far advanced, and still making progress, I think it is the duty of the physician, however much it may be opposed to the wishes of the patient, to recommend strongly that he should remain at home.

The chief point with reference to hygienic treatment, to which I wish to direct attention, is the use of articles of diet which tend to unite readily with oxygen, and may thus, in the disabled condition of the pulmonary organs, promote a more perfect performance of their functions. Liebeg has shown that there are two kinds of nutriment,—the plastic or sanguigenous, which form the tissues of the body, and are derived from the vegetable as well as the animal kingdom. A portion of these is necessary not only in pulmonary diseases, but under all circumstances. The other is the non-nitro-

genous or combustible, which support respiration. Starch, sugar, fat, and alcoholic liquors, are the chief of these. As we have seen that there is reason to believe, that the efficacy of cod liver is, partly at least, due to the fact of its serving this purpose better than any other oil or fat, it becomes us to inquire, if we can support its action, by any other means calculated to produce a similar effect.

It must be evident, that if oxigenation be deficient in chronic diseases generally, and in pulmonary diseases more especially, the deficiency could be counteracted, so far as the ingesta are concerned, only in one of three ways,—by giving remedies capable of directly communicating oxygen to the system—by giving such as would determine a greater action of the atmospheric oxygen upon the tissues of the body, or the combustible constituents of the food—or by selecting articles of diet having a strong affinity for oxygen, and which might therefore cause increased absorption at the lungs. It has been thought that nitric and nitro-muriatic acids have some oxigenating power; but whether this be so or not, there can be no doubt that, given in conjunction with cod liver, they promote its beneficial action, a fact of which experience has fully convinced me. It has also been thought that chlorate of potass has likewise an oxigenating power; and it has been said by Dr. Williams and others, that it is a remedy of some efficacy in this disease, but on this point I cannot speak from experience. Peroxide of hydrogen, or oxigenated water, is a compound which would certainly have a direct power of communicating oxygen; but I am not aware that any trials have been made with it.

Again, with reference to remedies capable of increasing the action of oxygen on the tissues of the body or the food, I would observe, that alkalis have this power to some extent. The blood is an alkaline fluid, and its alkalinity is essential for the various purposes it serves, more especially respiration and animal heat. The experiments of Dr. Parkes* show that liquor potassæ is a remedy which determines increased oxigenation of the tissues; and I may observe, that in some states of pulmonary disease it is a very valuable

* *British and Foreign Medico-Chirurg. Rev.* January, 1853.

medicine. In the case referred to, at page 30, it formed an essential part of the treatment.

Of the combustive articles of food there is none which appears to have a stronger affinity for oxygen than *Sugar of Milk*,* which is an important constituent of all kinds of milk. As yet I believe it has never been used to any great extent as an article of diet; but, as there is probably none, unless it may be some of the oils, which has so great an attraction for oxygen, or so readily affords material for respiration, it appears to be deserving of much greater attention in this point of view than it has yet received, more especially, as there are already facts proving its utility in consumption. It has long been known that asses' milk is a valuable article of diet in advanced cases of consumption, and in pulmonary diseases generally. It seems to afford a certain amount of nourishment without any excitement. In the case of a lady, who came under my care in a very advanced stage of consumption, it appeared to have a decided effect in prolonging life. Dr. Pareira says, "in the convalescence from acute maladies, in consumptive cases and chronic diseases of the digestive organs, it is a most valuable aliment." Now, as sugar of milk forms the chief nutritive constituent of the milk of the ass, as well as of that of the mare, we must ascribe its beneficial properties to this article. I would also observe, that whey has been found useful in consumption. Dr. Pareira has remarked, that whey, the nutritive properties of which depend upon the sugar of milk, is well adapted for pulmonary and catarrhal affections, especially incipient phthisis and hæmoptysis; also, that it promotes the action of the secreting organs, and is useful in congestion of the *liver*. Goats' whey has been more especially used in consumption; and Ancell directs attention to it, observing, "it has been said that the use of goats' whey, of particular localities, in large quantities, two or three quarts in a morning, has cured consumption." He attributes its beneficial effects to its impregnation with the aroma of herbs, observing, that the whey of goats fed on the mountains of Wales,

* "In the cheese dairies of England thousands of cwts. of this valuable respiratory matter are annually lost in the whey."—LIEBIG'S LETTERS ON CHEMISTRY, 3rd ed., 1851.

Ireland, and the Swiss Alps, has obtained the highest celebrity. Any superior advantage it may have in these localities must, however, be attributed to the beneficial effect of the mountain air upon the patient; and any curative value it possesses must be ascribed to the sugar of milk, which forms the chief part of this as well as other kinds of whey, and of asses' milk.

The facts now adduced are the result of practical observation, apart from any theoretical opinion as to sugar of milk. They are sufficient to arrest attention, and should lead us to inquire, if there be anything further in its properties or composition, which would lead us to ascribe the beneficial properties of these articles of diet, to sugar of milk, and would justify the opinion expressed of its nutritive qualities in pulmonary affections. Further inquiry will show that there are: and, in order to prove this, we shall examine it with respect to its attraction for oxygen; its power of supplying material for respiration and animal heat; and the nature of the changes it undergoes when taken as an aliment.

The attraction of sugar of milk for oxygen is very considerable, so much so, that in certain circumstances it has the power of reducing some of the metallic oxides more or less completely. The circumstances in question are the presence of an alkali. With ammonia, the elements of sugar of milk take, from oxide of silver, the whole of its oxygen; and with potass, from the oxide of copper, one half of its oxygen. When sugar of milk is taken as food, it is either absorbed at once into the blood, or is converted into lactic acid. We have seen that the blood is an alkaline fluid. It furnishes therefore the necessary condition for the oxigenation of sugar of milk; and as we know, that the oxygen absorbed in the process of respiration combines first, and chiefly, with those substances which have the greatest affinity for it, there is no reason to doubt, that it at once supplies fuel for respiration, an important matter where the lungs are disabled; and thus we can readily account for the beneficial properties of those kinds of aliment, of which it forms the chief component. The formula of sugar of milk is $C^{12}\ O^{12}\ H^{12}$, and when absorbed into the blood it disappears with great rapidity, being converted into carbonic acid and water. Twelve equivalents of oxygen displace the hydrogen and form carbonic acid, and the twelve of hydrogen unite with an equal number of oxygen to form water. It would seem, however, that part of the sugar of milk is converted into lactic acid in the stomach, and when this enters the blood it forms an alkaline lactate. This also undergoes oxidation; and Lehmann observes, "we know of no substitute which could better act in the blood as food for the respiration, than the alkaline lactates." In order that sugar of milk may undergo oxidation in any of the ways referred to; whether out of the animal economy; when directly absorbed into the blood; or after convertion into an acid; it would seem that the presence of an alkali is necessary. This leads me to observe, that Dr. Parkes found, in his experiments with liquor potassæ, that two very different effects were produced, according as it was given, fasting, or soon after a meal. In the former state, it produced a powerful oxidizing effect upon the tissues of the body, and increased the quantity of extractive matters in the urine. In the latter it appeared to have no such effect, simply acting as an antacid. He has not attempted to give any explanation of this; but I conceive, that it may have been owing to the action of the alkali being produced, upon the saccharine and other materials for respiration contained in the food, the presence of which may thus have protected the blood and tissues of the body from being directly acted upon.

There is one other point, with respect to the supply and use of saccharine and oleaginous materials for the purpose of respiration and combustion, which I have still to notice. It is the fact, originally pointed out by Liebeg, and now admitted by physiologists, that one of the great offices of the liver is, the preparation of combustive material for the respiratory process. This is a point which has not been sufficiently kept in view by medical men; but it is one of great practical interest, when we consider that the function of the lungs, and that of the liver, are so intimately connected and mutually dependent, that derangement of the secreting function of the latter, must necessarily interfere with the former, and may not improbably be one of the chief causes of a tubercular state of the blood. The

liver prepares the combustive materials for respiration; and of this there are two sources, one being the worn out tissues of the body, the hydro-carbonaceous part of which forms bile, and being re-absorbed is consumed at the lungs; the other is the saccharine and fatty matters of the food, which are consumed in a similar way. It would seem, however, that the liver has not only the power of preparing the latter, but also of forming saccharine at least, if not oleaginous matters from the blood. A defect in this power may be one of the great causes of tubercular diseases, and if we can—by giving a ready-formed oil which is stored up at certain times in the liver of the cod fish—rectify to a great extent any defect in its action, so far at least as the oleaginous material for respiration is concerned, there is good reason to expect that still more may be gained, by giving in a ready-formed state, the other combustive material, the saccharine. Dr. Carpenter says, "It appears that fatty matters are elaborated in the liver from saccharine or some other constituents of the blood; so that even when no fat can be detected in the blood of the vena porta, that of the hepatic vein contains a considerable amount of it. A portion of this fat may be destined for immediate elimination in the lungs; but if the supply that should be introduced by the lacteals be deficient, it would doubtless be made subservient to the formative processes. So, again it would appear certain, that the liver elaborates from some other constituents of the blood a saccharine compound,* (diabetic sugar,) which is destined for immediate elimination." Lehmann, on the other hand, states that the blood entering the liver by the vena porta contains much fatty matter, whereas that leaving it by the hepatic veins con-

* The objection urged by Dr. Inman in the discussion, that tubercles frequently form in diabetes, though the blood is loaded with sugar, appears at first sight opposed to the use of sugar of milk; but a closer examination of the cause strengthens the author's views. In consumption, there is deficient oxigenation, and defect in the formation of the respiratory material. In diabetes it is abundantly formed, but is lost, and there is deficient oxigenation and deposit of tubercle in the lungs from another cause—because "the conversion or regressive formation of the sugar is impeded" (Lehmann), a view confirmed by the fact that rennet, by promoting the lactic acid fermentation, has been found a useful remedy in diabetes.

tains a diminished quantity, and much sugar; and he has endeavoured to show that the biliary matter, or cholic acid, is formed from sugar and fat, still serving, though less directly, the purpose of preparing food for the lungs. Whichever view be correct, we see how important is the correct performance of the function of the liver in reference to pulmonary diseases, and how curiously the saccharine and oleaginous constituents of nutrition are linked together, not only in the ultimate purpose they both serve in the animal economy, but also in their preparation for this purpose by the same organ.

The preceding facts and train of reasoning have led me to use sugar of milk, as an article of diet, along with the other food, in some cases of consumption; and, as I believe, independent of the statements with reference to whey and asses' milk, that I have seen advantage from it, I wish now to recommend it as an article of diet deserving of more extensive employment. I may also remark, that the use of grapes in considerable quantity, as an article of food, has had a certain reputation in consumption, being called the *"cure des raisins,"* and that they contain a large quantity of grape sugar, the kind which most nearly resembles milk sugar in its character and composition.

The number and variety of subjects treated of in this Report, have necessarily rendered my observations on some points brief, and less perfect than they should otherwise have been; but I hope to be able from time to time to lay before the Society reports of a similar kind; and I trust that it will at least stimulate research into the nature and causes of tubercular diseases, and keep alive the spirit of inquiry and improvement, awakened of late years with respect to the treatment of a very common and most important disease.

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STATISTICAL REPORT

ON THE

SICKNESS AND MORTALITY

AMONG THE

TROOPS SERVING IN THE MADRAS PRESIDENCY.

PREPARED FROM OFFICIAL DOCUMENTS PRINTED BY ORDER OF THE MADRAS GOVERNMENT.

BY

T. GRAHAM BALFOUR, M. D.,

GRENADIER GUARDS, &c. &c.

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STATISTICAL REPORT.

The extensive British possessions in India, comprehending within them such diversities of physical geography and varieties of climate, offer a wide field for the study of the natural history of disease and of the influence of climate on the different races of mankind, which has hitherto been little cultivated. Of late years the increased attention paid to this interesting branch of science has led to the collection of much valuable information, which, however, has not yet been made sufficiently available to the medical profession. We purpose in the following report to submit the results of an investigation into the sanitary condition of the troops in the Madras Presidency, instituted by order of the Supreme Government.

In 1835 Mr J. R. Martin, Presidency Surgeon, Calcutta, brought under the notice of Sir Charles Metcalfe, the Governor-General, the great advantages which might arise to the army from the adoption of a well-organized system of reports on the topography and sanitary statistics of the different stations in India. These reports were to be furnished periodically by the officers of the medical department, and to be collated for publication under the direction of the medical boards of the three Presidencies. Mr Martin, at the same time, submitted a memoir containing the details of a plan for collecting and arranging these materials, and specifying the subjects on which information was required. The Governor-General, justly appreciating the value of the suggestions, directed the memoir to be circulated to the medical department, which was done in the following official memorandum, dated 25th November 1835.

"Memorandum to be circulated to the medical service by the Medical Board.

"1. The Honourable the Governor-General of India in council is pleased to direct that the officers of the medical service, whether in the civil or military branches, be required to furnish, through the superintending surgeons of divisions, information on the following points having reference to the medical topography of the district, station, or cantonment, whether fixed or temporary, with the localities of which each officer may in the course of service be best acquainted.

"2. In the present order it is only intended to point out matter on which information is considered essential, but further details will be arranged by the medical board on questions incidental to general medical topography, and on which it is hoped that much interesting and useful information will be furnished by those officers whose qualifications and experience enable them to speak to such matters.

"3. The topographical reports, when forwarded to the presidency by the superintending surgeons, will there be collected by a committee of three medical officers, nominated by the medical board, and such as are approved of will be ultimately printed and formed into a memoir, a copy of which will be furnished to all staff-surgeons and officers of the quarter-master-general's department.

"4. The reports required from the medical service should contain specific information on the following points:—

TOPOGRAPHICAL DETAIL.

"1*st.* Situation, boundary, elevation, facility and mode of communication with the place described; general direction of the prevailing winds, &c. Mountains, with particular notices of such ranges as might afford advantage and convenience for sick convalescent troops.

"2*d.* Seas, rivers, lakes, wells, morasses, drainage, state of the canal, &c.

"3*d.* The climate; its physical character and medical effects, &c.; with the highest, lowest, and medium states of the thermometer.

"4*th.* The soil; its general nature, its elevation above the adjacent seas and other waters; nature of the waters; the period of the year when noxious exhalations arise from the soil in greatest abundance; and the extent to which evaporation has proceeded when these exhalations become most deleterious, &c.

"5*th.* Vegetable, animal, and mineral products.

"6*th.* The state of the agriculture.

"7*th.* Roads and communications.

"8*th.* The diseases, endemic and epidemic, and those that may be hereditary. The diseases of particular classes of manufacturers, of prisons, and poor-houses.

"9*th.* On the state of the barracks, their situation, the date of their erection, their form—whether built in square or parallel lines, or in detached houses, and whether of wood, brick, or stone—quality of the supply of water, whether from springs, wells, or rivers.

"10*th.* Nature of the soil on which the barracks are built, and of that immediately around; their state in regard to damp, cold, or exposure to particular winds, and their general aspect; drainage of the ground of the barracks.

"11*th.* Size of the rooms in feet, as to height, length, and breadth; number of windows and doors.

"12*th.* State and dimensions of the bedsteads; how many the barracks will accommodate.

"13*th.* State of the kitchen and other out offices.

"14*th.* State of the places of confinement, as to situation, dryness, &c.; and whether any particular disease has ever been traced to them.

"15*th.* The hospital. The same questions as relating to the barracks.

"16*th.* Distance of the hospital from the barracks, and whether there be a separate airing ground for the convalescents.

"17*th.* State of the store rooms, the surgery, and dead-house, attached to European corps.

"18*th.* Whether any patients have ever laboured under any diseases that could fairly be attributed to the locality of the hospital.

"19*th.* Sketch maps of particular localities would prove a great addition to the reports. (Signed) W. CASEMENT, Col. C. B., Secretary to the Government of India, Military Department."

In compliance with this order, reports were forwarded by the officers on the Madras establishment to the medical board of that presidency, but they were in many respects so defective, that repeated references regarding them were necessary, and it was not until August 1842 that the board was enabled to print for circulation a "General Topographical and Statistical Account of each of the Military Divisions of the Presidency," compiled from these documents.

It is much to be regretted, that, owing to the want of uniformity in the returns in use in India, the data from the various stations frequently differ in form, and are, in consequence, not always available for the purposes of comparison, and that this defect cannot be remedied, owing to a large number of the diseases being included under the general term of "other diseases," instead of being distinctly specified. There is, however, much information in regard to the more prevalent diseases both among Europeans and natives, which will prove a valuable addition to our knowledge on this subject. This we have endeavoured to arrange in a form adapted for the purpose of comparison, as illustrating the influence of locality and race on the development and results of morbid action.*

* We understand that orders have been recently sent from this country, directing the adoption of a uniform nomenclature and system of medical returns in the three presidencies, so that we may anticipate receiving, in future, more complete and accurate information on the subjects comprehended under the title of medical statistics. It is melancholy to reflect that such an order was necessary to effect so desirable an object, and that the measure did not originate with the members of the medical boards, whose duty it was, and whose ambition it ought

The Madras Presidency lies between the 8th and 22d degrees of N. Lat., and 75th and 85th degrees of E. Long., being bounded on the north by Hindostan Proper, on the south by the Indian Ocean and Gulf of Manaar, on the east by the Bay of Bengal, and on the west by the Indian Ocean and the Bombay Presidency.*

The country may be described as consisting of extensive plains stretching from the sea coast to the foot of the mountain ranges, and varying in breadth from 30 to 70 miles; of two chains of mountains termed the Eastern and Western Ghauts, running from north to south throughout the Presidency; and of the Table Lands between these two chains. The climate of the different parts of a country, comprising an area of 140,000 square miles, and presenting such variety of physical aspect, must obviously vary greatly, and be influenced by numerous local modifying circumstances; we shall therefore reserve our observations on this subject till we come to the description of the various military stations in detail. The principal circumstance affecting the climate of Madras is the occurrence of the periodical winds or monsoons. The N. E. monsoon commences about the middle of October and continues till the end of February, and the S. W. blows from the beginning of May till the beginning of September: heavy rains and much thunder and lightning accompany the setting in of each. In March and April southerly winds prevail; and from the end of August till the beginning of October the winds are very variable and the weather close, sultry, and oppressive. The period of the setting in and termination of the monsoons varies with the latitude, but the above may be considered a general description of their prevalence in this Presidency.

The troops on the establishment have generally consisted of one cavalry and six infantry regiments of the Royal Army, the E. I. C. European Artillery and Madras Regiment of Infantry, and of their native army composed of cavalry, artillery, and infantry. The European soldiers in the Company's service are enlisted in the United Kingdom in the same manner as for Her Majesty's army, but are entitled to their discharge after 21 years' service with a pension of one shilling a day, or, if discharged as unfit on account of broken constitutions after 14 years' service, with a pension of ninepence.

The Sepoy, if he wishes it, is entitled to his discharge in time of peace after having served three years, provided the regiment is nearly complete to its establishment, but, in time of war, may be retained as long as his services are deemed necessary. After 15 years' service, if labouring under a disability which disqualifies him for active duty, or if wounded or having contracted incurable disorders in the service before completing that term, Sepoys may be recommended to be placed upon the invalid establishment. Those who are fit for garrison duty are drafted into invalid battalions, while the others are permitted to retire on the invalid pay to any place within the Company's dominions. Native soldiers convicted of theft are discharged as being a disgrace to the military profession, and their condition being greatly superior in point of pay to that of the class from whom they are taken, this is considered a severe punishment.

to have been, to advance the best interests of a profession in which they have risen to the most honourable and most lucrative appointments in the service of the East India Company.

* In addition to the territory on the peninsula, the Madras Presidency comprises the British possessions on the Tenasserim coast, and at Singapore, Malacca, and Penang. We propose, however, to confine our observations to the troops serving in the peninsula of India.

The Sepoys are not enrolled under the age of 16 nor above 30, and are in general active healthy men. In 1838, about six-sevenths of the native cavalry, and two-fifths of the native infantry in the Madras Presidency were Moosulmans—the rest being Hindoos.

During the ten years, 1829–38, the average annual strength of the Madras army has been 10,343 Europeans, and 56,840 natives. The total admissions into hospital among the former have amounted to 186,865, and the deaths to 4,725; and among the latter the admissions have been 347,327, and the deaths 9,121. Reducing these to a common ratio we find the proportions to have been as follows:—

	Annual ratio per 1000 of Strength. Admitted.	Died.
European troops,.........	1807	45·7
Native troops, ...	611	16·

Thus it appears that the admissions and deaths among the Europeans have been nearly thrice as numerous, in proportion to the strength, as among the native troops. We shall postpone the consideration of the relative prevalence of the different classes of diseases till we have briefly described the various military posts of which the medical details are available.

The Madras Presidency forms seven military divisions, with three stations beyond the frontier and one beyond seas. This arrangement has been followed in the preparation of the Reports by the Medical Board; but however suitable it may be for military purposes, it does not seem to be well adapted for the investigation of the influence of climate on the health of troops, or its modifying effects upon disease. We shall, therefore, adopt a different classification of the stations, and examine,

1*st*, Those situated on, or immediately adjacent to the sea coast.

2*d*, Those on the plains between the coast and the mountain ranges.

3*d*, Stations on the table lands.

4*th*, Peculiar stations, including under this head two on the coast, viz. Cuddalore, where the European pensioners are located, and Vizagapatam, (as far as regards European troops,) which is occupied by the Carnatic European Veteran Battalion; and two stations on the plains, viz. Wallajahbad, where are the head quarters of a Native Veteran Battalion and the Drumboy Establishment, and Poonamallee, the depot of Her Majesty's troops, where recruits arriving from England remain for some time previous to joining their corps, and invalids wait till an opportunity occurs of sending them home. It is obvious that, to include these in any of the other three classes, would be apt to lead to erroneous conclusions.

1. *Stations on the sea coast.*

Commencing on the Malabar coast, the first military station is the cantonment of

1. *Mangalore*, situated in 12° 51′ N. lat., 74° 54′ E. long., in the immediate vicinity of the sea, but separated from it by a back water, formed by the junction of the Bolar and the Baloore. The town and cantonment stand on a peninsula formed by these rivers, which, in the rainy season, are navigable for a considerable distance inland; but in the dry season contain little water, except what flows in with the tide. Their banks are high and steep, planted with coco-nut trees, or laid out in gardens or rice fields, and their beds are sandy or gravelly. Immediately under the cantonment, however, an extensive and deep bed of alluvium has been deposited from the meeting of the two rivers. The peninsula is surrounded by a level belt of land from one to two hundred yards wide, converted at the southern extremity into rice fields, or thickly planted with coco-nut trees. Along this belt the fishermen and labourers chiefly reside; and the great bazaar extends north about half-a-mile. Toward the north end of the peninsula the houses are detached on separate hills, which, with the intervening low ground, are covered with jungle. Immediately beyond the cantonment the country becomes more elevated, rugged, and barren. The valleys in the neighbourhood contain a deep rich soil, and are very carefully cultivated. The chief produce is rice, of which three crops are obtained within the year.

The cool season extends from November to March, during which time the thermometer ranges from 65° to 75°; from that period till May it stands at from 80° to 86° in the shade, and for a short time before the monsoon sets in, even as high as 90°; about the middle of May, when the rains have commenced, the heat becomes moderated, and the temperature ranges between 75° and 82°. The fall of rain averages about 128 inches annually.

The cantonment stands on the north side of the town on a gently rising ground; the Sepoy lines are on the south side of the parade, open to the sea breeze, and well drained. The huts are built of clay, and thatched with grass, and extend in parallel lines from east to west. The hospital is well raised, dry, and airy, and stands at their north-east end. There are no European troops at Mangalore; the aggregate* strength of the native force stationed there during ten years, 1832–41, has amounted to 11,079, among whom 7875 admissions and 151 deaths have occurred, being in the proportion of 710 and 13.6 per 1000 of the strength annually.

Passing southwards along the coast, the next station is

2. *Cannanore*, situated at the bottom of a small bay in 11° 51′ N. lat., 75° 26′ E. long. The fort is built on a jutting portion of land which forms one side of the bay, and is about quarter of a mile distant from the town. The European barracks are situated a few hundred yards west of the fort, and the native barracks, hospital, and lines about a mile and a quarter in rear of it. The European barracks are built of stone, and tiled; they stand on an open plain about 500 yards from the sea, and 30 feet above its level, are of a quadrangular form, and afford ample accommodation for a regiment, but the ventilation is said to be defective. The town is populous, with close, very filthy streets; it is surrounded by small hills and narrow valleys, free from any extensive reservoirs of stagnant water, but has a few rice fields in the neighbourhood. It is distant 27 miles from the Western Ghauts. The soil is gravelly, composed of the debris of laterite, and scarcely a foot in depth, the substratum being laterite. The cool season commences in November, and lasts to the end of February; the hot season from the beginning of March till towards the end of May; and the rainy from that time till the end of October. In 1836–7 the maximum monthly temperature was 88°, the minimum 67°, and the mean about 78°. The greatest monthly range was 15° in the hot, and the least was 6° in the rainy season, the medium throughout the year being 10½°, and the annual range 21°. The following table shows the monthly fall of rain in inches during three years.

	Jan.	Feb.	Mar.	Ap.	May	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1835	...	...	⅛	4	7¼	62½	12¾	14½	9⅝	14¼	...	...	131⅛
1836	...	...	...	...	5½	45⅛	22⅞	19⅞	16¾	8	6¼	...	123⅜
1837	...	...	...	...	11¾	30⅛	29⅞	11⅞	10⅝	10⅛	14⅜	...	118⅞

* As this term occurs frequently in the following pages, it may be necessary to state for the information of readers unaccustomed to statistical investigations, that the aggregate strength of troops for any period is obtained by adding together the annual strengths for that period; and the average strength at any station may be ascertained by dividing the aggregate by the number of years.

During the rainy season, the air is loaded with moisture to such an extent, that metallic substances immediately corrode, woollen articles become saturated and rapidly destroy, books are deprived of their bindings, articles of furniture fastened with glue fall to pieces, common salt deliquesces, and refined sugar crumbles into powder.

The European troops at Cannanore usually consist of one regiment; the aggregate strength during ten years, 1829–38, amounted to 7959 men, among whom 12,187 admissions into hospital took place, and 300 deaths, being in the ratio of 1531 and 37·7 per 1000 annually. The lowest ratio of admissions was 940 in 1831, and the highest 2237 in 1837, while the mortality ranged from 13·5 in 1830, to 60·7 in 1837. During the last four years of this period the sickness has been considerably above the average, a circumstance attributed by the medical officers to the increase of jungle about the cantonment, and to the greater amount of intemperance among the men. The diseases in which the increase has been most apparent are dysentery, hepatitis, and rheumatism.

The sickness and mortality among the native troops at Cannanore, consisting usually of two regiments, with one company of artillery, are not stated separately, but included with the other stations on the Malabar coast, and will be noticed hereafter.

3. *Calicut.*—This town is situated in 11° 15′ N. lat. and 75° 50′ E. long., little raised above the sea, and consists of a street about three-quarters of a mile in length, with small cross streets leading from it. The Sepoy lines are on the north-west of the town, and are open to the sea breeze. There are numerous tanks well supplied with water, and the town is well drained. The soil consists of a light brown sand; the climate and seasons are nearly the same as at Cannanore. There are no European troops at Calicut; the native force, in thirteen years, 1829–41, amounted to 2960, the admissions into hospital to 1416, and the deaths to 24, making the ratio of sickness 478, and of mortality 8·1 per 1000 of mean strength.

There is a detachment of 100 native soldiers at Tellicherry, on the coast fifteen miles south of Cannanore, which is said to be remarkably healthy; but no details of the sickness and mortality have been furnished. We have already stated that the returns of the native troops at Cannanore are included along with those from the other stations. By this general return it appears that during ten years, 1829–38, the aggregate strength of native troops employed at all the stations and outposts along this portion of the coast, extending between the 10th and 15th degrees of north latitude, has been 39,743; the admissions have been 22,668, and the deaths 507, giving the respective ratios of 570 and 12·8 per 1000 annually. The same circumstance has occurred among the native troops in this division, as was observed in regard to the Europeans at Cannanore, that during the last five years the amount of sickness and mortality has considerably exceeded the average, from an increase in the cases of fever and rheumatism, for which no adequate reason has been assigned. This negatives the opinion already noticed, which attributes the increased proportion of fever to intemperance, as the native soldier is rarely addicted to this vice. It is obvious that whatever the cause of increase may be, it is one affecting both the European and the Sepoy.

From Calicut, passing southwards, the next station on the coast from which military returns have been furnished, is

4. *Quilon*, in 8° 54′ N. lat., 76° 39′ E. long., built on ground rising by a gentle ascent from the sea to the height of 40 feet. About twenty-five miles east of Quilon is a range of lofty hills, attaining a height of between 2000 and 3000 feet, and covered with thick jungle. From these, numerous mountain streams flow into the back waters or lakes, which extend along and parallel to the coast, communicating in many places with the sea, and affording an important means of transit between the different towns. There are likewise two rivers, one to the south, the other to the north of Quilon, navigable for boats to the distance of twenty miles.

Immediately around Quilon the soil is sandy, but in the interior, which presents a succession of hill and valley, the soil of the low grounds is a rich loam, and, where irrigated by the mountain streams, or along the banks of the rivers and back water, yields abundant crops of rice.

The wet season here commences in the beginning of June, and lasts till the end of October; the average fall of rain being about 120 inches. The highest range of the thermometer in 1835–6 was 88° in April and May, and the lowest 69° in December and January; the mean annual temperature being about 81°.

The native force at Quilon during four years, 1835–8, amounted to 3118, among whom 2159 admissions into hospital and 43 deaths took place, being 692 and 13·8 per 1000 of the strength.

Passing round Cape Comorin to the east or Coromandel coast, the next station is

5. *Ramnad*, situated in 9° 23′ N. lat., 78° 50′ E. long. The fort contains 5000 inhabitants, and the town about the same number. The houses are built of mud and thatched. The native troops consist of one company, and reside in houses in the town, there being no separate lines for their accommodation. The country around is an extensive level plain with few trees, and the soil is light and sandy. Although Ramnad is at a dis-

tance of about eight miles from the coast, yet owing to the level nature of the country, it enjoys the full benefit of the sea breeze. The aggregate force employed during ten years, 1829–38, has amounted to 1104 native soldiers, among whom there have been 584 cases and 24 deaths, or in the proportion of 529 and 21·7 per 1000 of the strength.

This high rate of mortality has arisen, as will be subsequently seen, from the ravages of cholera. Had the deaths it caused been deducted, the annual ratio would have amounted to 5·4 per 1000 only, which is a fraction lower than at any of the other stations on the coast.

6. *Negapatam*, the next station to the northward, in 10° 45′ N. lat., 79° 50′ E. long., is built on an open, level, sandy piece of ground sloping towards the sea, above which it is elevated four or five feet. It is well drained; but at a short distance to the south is a level waste, which is covered with sea water during the monsoon. The surrounding country is open and level.

The barrack for the native troops is an old Dutch house on a dry sandy piece of ground to the west of the town, built of brick and mud, with a tiled roof. Most of the soldiers, however, being married, reside in the town. The aggregate strength during ten years, 1832–41, was 1819, the admissions 279, and the deaths 15, being only 153 per 1000 of the former, and 8·2 of the latter.

7. *Palaveram*, called also the Presidency Cantonment, lies about four or five miles from the coast, on the western side of the Palaveram range of hills, three miles south of St Thomas's Mount. Although the hills intervene between the cantonment and the sea, yet the houses enjoy the benefit of the sea breeze to a considerable extent. The soil in the neighbourhood is sandy, free from jungle, and little cultivated. The barracks and hospitals for the troops are substantial well constructed buildings, on ground sloping gently from the foot of the hills, and well drained. The huts for the men stood between the barracks and the Adyar, about 200 yards in rear of the former; but the ground being swampy, and the huts frequently under water during the monsoon season, from the overflowing of the river, lines were erected on higher ground to the right of the cantonment, and about half a mile from the barracks.

No European troops have been quartered at Palaveram; the aggregate strength of the native force during five years, (1834–8?) amounted to 3961 men, the admissions to 2559, and the deaths to 31, being respectively 646 and 7·9 per 1000 of mean strength.

8. *St Thomas's Mount*, the head quarters of the Madras Artillery, is situated in 13° N. lat., 80° 15′ E. long., 8 miles west of

Fort St George, and four or five from the sea, at the base of the eastern and southern sides of the hill from which it is named, and which rises to a height of 340 feet above the level of the sea. The Adyar flows about a mile north of the Mount, forming a considerable river in the monsoon, but becoming almost dry in the hot season. There are numerous tanks in the neighbouring country, from which the land is irrigated for rice cultivation, but no marshes exist near the cantonment, the soil of which consists chiefly of red clay and gravel. The climate is nearly the same as that of Madras, except that the temperature is rather higher in the hot season.

The barracks of the foot artillery are built of brick, and are floored with granite. They run in a direct line north and south, at the bottom of the hill, are open to the sea breeze, and well ventilated. The married men and those allowed to live out of barracks reside in streets of small houses on the base and sides of the hill.

The horse artillery barracks are on the south side of the Mount, built, like the others, of brick, and are commodious and well ventilated. The hospital is a square bomb-proof building, 80 yards distant from the barracks, and calculated to contain 28 men.

The lines of the native foot artillery are situated on the south side of the cantonment; the men are comfortably hutted, and the lines are clean and dry.

The following tabular statement shows the amount of sickness and mortality among the troops: the horse artillery for 9 years, 1829–38, exclusive of 1831; the European foot artillery for 10 years, 1829–38; and the native foot artillery for 9 years, 1829–38, exclusive of 1832.

	Aggregate strength.	Admissions into hospital.	Deaths in hospital.	Ratio per 1000.	
				Admitted.	Died.
European Horse Artillery,	1721	3873	48	2250	27·9
... Foot Artillery,	5182	7498	125	1447	24·1
Native Foot Artillery,......	4417	1633	61	370	13·8

9. *Madras*, the capital of the presidency, is situated on the coast, in 13° 6′ N. lat., 80° 21′ E. long., on a flat sandy plain, very little above the level of the sea. The town within the walls, called Black Town, extends nearly a mile along the beach, and is in some places not more than 6 inches above the level of spring tides; the streets are for the most part irregular, narrow, and ill ventilated. Fort St George lies about half a mile south of Black Town. The town beyond the walls is composed of the villages of Royaporum, Vepery, Chintadrapettah, Poodoopettah, Egmore, Triplicane, Royapettah, and Saint Thomé, occupying altogether

an irregular space of 10 to 12 miles in circumference. The drainage of Madras is bad, chiefly from the difficulty of obtaining a sufficient fall. The principal streets are generally clean and wide, but the back streets are stated, with few exceptions, to be filthy and offensive, especially in Royaporum and Triplicane. There are several localities about Madras where, from the inequalities of the ground, water accumulates during the rainy season, forming extensive shallow ponds or tanks, which become dried up during great part of the year, and are then cultivated as rice fields, or used for grazing cattle. The country around is level and sandy, the nearest hills being St Thomas's Mount, 8 miles to the S. W., and the Pulicat hills, 25 to 30 miles north.

The cool season at Madras extends from November to the end of February, the wind generally blowing from N. E. and E.; the hot season commences in March and continues till the end of May or June, when the rains set in, the prevailing wind being the south or "along shore wind;" and the rainy season lasts from this period till about the middle of November. During the rainy season the land wind generally blows from midnight till 12 or 1 o'clock in the day, when the sea breeze sets in and continues till midnight. About September the sea breeze becomes uncertain, and the winds light and variable till the beginning of October, when the N. E. monsoon is established. The mean temperature ranges between 76° in the cool, and 88° in the hot season.

The European troops are all quartered in Fort St George, at the northern and western extremities of which the barrack is situated; it is of an oblong form, running north and south, and from its construction and the nature of the adjacent buildings, the ventilation is defective; the accommodation is stated to be usually rather limited. The duty of the men consists in the usual routine of drills, guards, and parades, and their diet is said to be unexceptionable in quantity and quality.

The aggregate strength of the European troops during ten years, 1829–38 was 13,981; the admissions into hospital were 26,057; and the deaths in hospital 600, giving the ratio of 1864 of the former, and 42·9 of the latter, per 1000 of the strength.

The native force consists of three regiments, which are hutted, one at Vepery, the second at Perambore, and a veteran battalion in Black Town.

The lines in Vepery consist of huts built of mud, thatched with Palmyra leaves or straw, and floored with mud mixed with a little chunam. They are each 12 feet by 6, with an enclosure of the same dimensions, are situated immediately to the south of the principal street of the village, and from defective drainage are damp in the rainy season. In their vicinity are several tanks which have been allowed to get into a very offensive state. The hospital is a substantial brick building at the north end of the lines, raised two feet from the ground, and having verandahs on each side.

The lines at Perambore are three miles N. W. of the fort, and one mile north of those at Vepery, to which they are similar in construction. Their site is only five feet above the level of the sea, and the ground being uneven, becomes marshy in the rainy season; it is chiefly under rice cultivation. The hospital is situated at the end of the lines, built of brick, and raised two feet from the ground; the accommodation is occasionally insufficient for the sick.

The lines of the veteran battalion in Black Town are about a mile and a-half from the fort, within the north wall of the town, in a low but healthy situation. The hospital is a brick building, tiled, and well ventilated.

The duty of the native troops is nearly the same as of the European, but they mount the guards in the more exposed situations. Their diet resembles that of the general native population, consisting chiefly of rice eaten with condiments, or curry. They are much addicted to the use of the beetle nut and of tobacco, but few of them indulge in ardent spirits.

During the ten years, 1829–38, the aggregate strength of the native troops in Madras has amounted to 60,142, among whom 25,944 admissions, and 661 deaths have taken place, being in the ratio of 431 and 11·0 per 1000 of the strength annually.

10. *Masulipatam*, the next station on the coast, lies in 16° 9′ N. lat., 81° 12′ E. long., about 286 miles north of Madras. The cantonment stands on a low sandy ridge, about two miles from the beach, from which it is separated by a saline marsh, forming in the rainy season a considerable lake: there is also a smaller fresh water marsh behind the cantonment. Beyond these marshes an alluvial plain extends to the foot of the hills, a distance of about 40 miles inland. The fort has been erected in the middle of the larger swamp, on the northern bank of a creek, in the form of an oblong square, surrounded by a wide and deep ditch, and is only five feet above high water mark. The soil on which it stands consists of clay and sand. From the very slight elevation of the ground, the cantonment is very badly drained, and during the rainy season some parts of it remain flooded for weeks. The hot season commences here in March and lasts till the beginning of June; the rainy season then sets in and continues till the end of October; while the cool season extends from November to the end of February. The annual fall of rain is about 35 inches. For a month before the rains begin, there is a regular succession of land and sea breezes; the former very hot and oppressive, the temperature at noon frequently rising to 100°. When

the monsoon is fairly established, the thermometer falls to about 86°; and, during the cool season, the mean temperature at noon ranges from 65° to 76°. The greatest range observed at this season has been 24°; but the usual average is from 10° to 12°; during the remainder of the year it is much less.

The barracks for the European troops are within the fort, substantially built of brick, the floors raised 20 inches from the ground and paved with stone. The lines and hospital of one native regiment are situated on the north-east of the cantonment, and the lines for another regiment on the south-east, on the edge of the salt marsh. The hospital of this regiment stands in the centre of the cantonment. The sites of both lines are dry; but during the rains, pools of water collect near them, which cannot be drained, and are only removed by the gradual process of evaporation and absorption.

Since 1833, no European troops have been quartered at Masulipatam, in consequence of the great amount of sickness and mortality which then occurred in Her Majesty's 62d regiment. From a statement of the admissions into hospital and deaths for some preceding years, we find that during ten years, 1822–32 exclusive of 1825, the aggregate strength amounted to 5110, the admissions to 10,476, and the deaths to 350, being in the proportion of 2050 and 68·5 per 1000 of the strength annually. In 1833, H. M. 62d regiment in nine months had 1337 admissions and 103 deaths, which, calculated upon a strength of 300, (three-fourths of the average annual numerical strength,) give a ratio of 4456 of the former and 343. of the latter. A committee was appointed to inquire into the cause of this frightful amount of disease, but the result does not seem to be satisfactory. They attributed it to the regiment having suffered much from cholera on the march to Masulipatam, and arriving in a state of despondency, which made them very amenable to the influence of malaria, the intense heat of the season that year, the impure state of the ditch, and the defective condition of the drains.* The

* The Medical Board, in submitting to Government the table from which these figures are compiled, stated that the ratio of mortality among all the European regiments in the presidency, from January 1813 to December 1819, was 5·690 per cent., while that of the regiments at Masulipatam, from 1813 to 1832 inclusive, was 5·100 per cent. They then add, "The rate of mortality having been somewhat lower than throughout the rest of the presidency for such a period, gives reason to conclude that the station cannot be considered, under ordinary circumstances, as unhealthy." Now the Board appear to have arrived at this conclusion from an error in the mode of calculating the ratio. In several of the years between 1813 and 1832, the regiments were quartered at Masulipatam during part of the year only. It must be obvious to any one conversant with the principles of statistics, that in such a case a proportion of the annual strength only should be taken, corresponding with the period for which the regiment was quartered there. Thus if the period was nine months, the sickness and mortality should be calculated on three-fourths of the strength; if eight months, on two-thirds, and so forth. The Board, however, have made the calculation in every instance on the

station appears on previous occasions to have suffered from severe outbreaks of fever and dysentery, attributable most probably to the unhealthy site on which the fort has been erected.

During ten years, (1830–40, exclusive of 1832,) the aggregate strength of the native troops at Masulipatam amounted to 13,660, who furnished 12,175 cases and 198 deaths, being in the ratio of 891 and 14·5 per 1000 annually, thus showing that this station is unfavourable also to the health of the native soldiers.

11. *Vizagapatam*, in 17° 42′ N. lat., 83° 22′ E. long., stands in a small bay, about six miles across, which is terminated on the south by a hill called "The Dolphin's Nose," several hundred feet high, and on the north by the village of Waltair. The soil on the higher ground is barren, composed of a reddish gravel; in the lower ground it is a rich loam. The hills approach to within three or four miles of the town, and are covered with low jungle to their summits; many of them are from 1500 to 2000 feet in height. The fort lies in the south-western part of the bay, separated from the Dolphin's Nose by a small river, and contains the barracks for the European veterans. The native town adjoins the fort: beyond the town, and between it and the village of Waltair, are the lines of the native regiment, on the right of which are the barracks and hospital. On the south of the lines is a swamp nine miles in circumference, but which is inundated by the sea at every tide, and on the east is a large tank, which contains water throughout the year. The average monthly temperature ranges from 70° in January, to 87° in May and June. The station is almost completely protected from the land wind by the neighbouring hills. The S. W. monsoon sets in about the first week of June, and continues till the middle of September, after which the north-east rains commence and prevail till the middle of November. The aggregate strength of the native force at this station for 11 years (1829–41, except 1831 and first half of 1832 and of 1841,) amounted to 7320, among whom there occurred 4091 admissions into hospital, and 97 deaths; the former being in the ratio of 559, and the latter of 13·3 per 1000.

The amount of sickness and mortality in the European veteran battalion will be noticed hereafter.

The last station included in this class is

12. *Chicacole*, in 18° 20′ N. lat., 84° E. long., on the north bank of the Nagglawdy river, about four miles from the sea, surrounded on the north, east, and west by extensive tracts of rice fields and cotton ground, which are partially irrigated by channels from the river. There are no hills of any consequence nearer than 12 or 13 miles. In the immediate vicinity of the town there are

average annual strength without any such deduction. Had the necessary correction been made, the deaths from 1813 to 1832 would have been found to average 6·394 per cent. annually, instead of 5·100 as above stated.

very few tanks; but within five or six miles are several of considerable magnitude, covered with rank vegetation, and in the dry season productive sources of malaria. The prevailing winds from April to September are from the S. and S. E., and from October to March from the N. and N. E.

The barracks and hospital are situated within an old mud fort in a ruinous condition, and the ditch of which, having been only partially filled up, contains pools of stagnant water. The regimental lines are about 100 yards to the south-west of the fort, and are open, airy, and regularly built.

In nine years (1830–41, exclusive of 1832 and 4, and the second half of 1833 and 40,) the sickness and mortality among the native troops have averaged 903, and 21·6 per 1000 annually, the admissions having been 5483, and the deaths 131, out of an aggregate strength of 6070 men.

Having thus briefly described the various stations on the coast, and shown the admissions into hospital and deaths at each, we shall proceed to examine by what diseases this amount of sickness and mortality has been occasioned. As it has been impossible, owing to the imperfect system of returns already noticed, to adopt precisely the same classification as that followed in the "Statistical Reports on the Health of the Army," it seems advisable here to state what diseases are comprised in each class in the following pages, and thus to save numerous explanations which would otherwise be necessary.

The same general principles of classification have been followed as in these reports. I. FEVERS, under which are comprised Febris Ephemera, F. Intermittens Quotidiana, F. I. Tertiana, F. Remittens, F. Continua. II. ERUPTIVE FEVERS, including Variola, Varicella, Rubeola. III. DISEASES of the LUNGS—Pneumonia, Catarrhus, Phthisis Pulmonalis, Asthma, Dyspnœa. IV. DISEASES of the LIVER—Hepatitis Acuta, H. Chronica. V. DISEASES of the BOWELS—Dysenteria Acuta, D. Chronica, Diarrhœa, Dyspepsia, Obstipatio. VI. CHOLERA. VII. DISEASES of the BRAIN—Apoplexia, Paralysis, Epilepsia, Amentia, Mania. VIII. DROPSIES—Anasarca, Ascites, Beriberi. IX. RHEUMATISM (Acute and Chronic.) X. VENEREAL AFFECTIONS—Syphilis Primitiva, S. Consecutiva, Gonorrhœa, Hernia Humoralis, Strictura Urethrae. XI. DISEASES of the EYES. XII. DISEASES of the SKIN. XIII. ABSCESSES and ULCERS—Phlogosis, Ulcus. XIV. OTHER DISEASES, including all cases not specified among the preceding.

The following table (TABLE I.) shows the number of admissions into hospital and deaths, with the ratio of these per 1000 of mean strength at the different stations on the sea coast.*

* The ratios in this table do not in every case correspond with those stated in the preceding descriptions, as the same period of time is not always included.

		10. Masulipatam.		11. Vizagapatam.		12. Chicacole.		‡Total exclusive of Mangalore & Calicut.	
Period	-8	1830-40		1829-41[3]		1830-41[4]			
Streng	63	13660		7320		6070		77504	
	D.	Ad.	D.	Ad.	D.	Ad.	D	Ad.	D.
Fevers,	45	7185	81	1422	16	2556	32	17204	240
Erupti	1	49	...	47	..	52	3	300	5
Lung d	23	146	13	118	7	48	4	974	96
Liver d	4	7	1	10	2	8	...	77	10
Bowel d	51	617	34	200	10	397	11	3236	184
Cholera	57	13	6	41	22	56	31	429	217
Brain d	14	26	4	32	6	34	2	267	35
Dropsie	19	182	32	37	16	256	22	589	102
Rheum	14	879	11	456	4	496	8	4470	56
Venere	2	329	...	325	2	130	2	1833	10
Eye dis	5	73	...	93	...	52	...	676	5
Skin di	4	794	1	367	...	357	..	4830	5
Absces	9	1139	2	557	1	599	1	5967	21
Other d	54	736	13	386	11	442	15	8209	176
Total,	302	12175	198	4091	97	5483	131	49061	1162

[3] Exc32 and 1841.
[4] Exc
† Dys " other diseases."
‡ The
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	9. Cannanore.		11. Vizagapatam.		12. Chicacole.		Total omitting Mangalore and Calicut.		Corrected ratio of Totals.§		Cavalry in United Kingdom.		Cape Corps (Hottentots.)	
	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	D.	Ad.	Died.	Ad.	Died.
Fevers,	233	2·8	194	2·2	421	5·3	222	3·2	222	3·1	75	1·4	66	·7
Erup do			6	...	9	·5	4	...	4	·1	1½	·1	2	...
Lung dis.	109	2·5	16	1·	8	·7	12	1·2	12	1·2	145	7·4	105	3·9
Liver dis.	102	5·4	1	·3	1	...	1	·1	1	·1	5	·3	4	·5
Bowel dis.	404	23·2	27	1·4	65	1·8	42	2·4	45	2·6	74½	·4	84	4·1
Cholera.	10	2·2	6	3·	9	5·1	6	2·8	6	2·8	4	1·2	...	...
Brain dis.	16	3·4	5	·8	5	·3	3	·5	4	·5	5	·6	4	...
Dropsies.	7	2·2	5	2·2	42	3·6	8	1·3	9	1·4	1	·2	1	...
Rheumat.	135		62		82		57		57	...	48		67	
Ven. affec	261		45		21		24		27	...	161		62	
Eye dis.	61	6·7	13	2·4	9	4·3	9	3·5	10	...	19	2·4	28	1·7
Skin dis.	52		50		59		62		70	...	29		8	
Ab. & ul.	187		76		98		77		86	...	132		90	
Other dis.	407		53		74		166		[illegible]	...	229		302	
Total,	1984	46·4	559	13·3	903	21·6	633	15·	633	15·	929	14·	623	10·9
Exclusive of cholera.		44·2		10·3		16·5		12·2		12.2		12·8		10·9

* Included among " o."
‡ The data being imp
§ In this column we he strength out of which the cases occurred having been 69126 instead of 77504.

TABLE I.—Showing the principal Classes of Diseases among the Troops at the Stations on the Sea Coast.

	European Troops.								Native Troops.							
	2. Cannanore.		8. St Thomas's Mount.		9. Fort St George.		Total of Coast Stations.		1. Mangalore.		3. Calicut.		2. Cannanore, Calicut, and Mangalore.		4. Quilon.	
Period,	1834-8.		1829-38.[1]		1834-8.				1832-41		1829-41		1834-8		1835-8	
Strength,	3575		6903		4514		14992		11079		2960		15782		3118	
	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.
Fevers,	833	10	1397	14	1462	6	3692	30	1210	27	274	4	2537	38	233	2
Eruptive do	1	...	*	...	8	1	9	1	55	1	5	...	87	1	10	...
Lung dis.	390	9	324	15	521	19	1235	43	154	21	24	2	235	29	81	2
Liver dis.	364	19	898	36	580	29	1842	84	23	4	..	...	13	2	9	...
Bowel dis.	1446	83	†1229	59	1871	66	4546	208	796	48	105	4	975	65	169	5
Cholera,	36	8	36	8	92	46	164	62	15	3	6	4	114	48	46	26
Brain dis.	58	5	*	...	80	7	138	12	41	3	7	2	50	5	12	3
Dropsies,	23	8	*	...	42	8	65	16	36	8	5	1	43	13	6	...
Rheumat.	482	4	669	5	707	5	1858	14	826	7	126	4	1132	13	223	2
Venereal,	932	...	*	...	1677	4	2609	4	506	2	77	...	478	4	94	...
Eye disease,	218	..	*	...	288	1	506	1	87	...	17	...	113	...	42	...
Skin dis.	185	...	*	..	88	...	273	...	1071	...	159	..	1694	...	542	...
Abscess&ul.	671	1	*	...	731	1	1402	2	1875	...	363	...	2268	7	*	...
Other dis.	1454	19	6818	36	1839	28	10111	83	1180	27	248	3	1543	35	692	3
Total,	7093	166	11371	173	9986	221	28450	560	7875	151	1416	24	11282	260	2159	43

	Native Troops.																	
	5. Ramnad.		6. Negapatam.		7. Palaveram.		8. St Thomas's Mount.		9. Madras.		10. Masulipatam.		11. Vizagapatam.		12. Chicacole.		‡Total exclusive of Mangalore & Calicut.	
Period,	1829-38		1832-41		5 years		1829-38[2]		1834-8		1830-40		1829-41[3]		1830-41[4]			
Strength,	1104		1819		3961		4417		20253		13660		7320 *		6070		77504	
	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.
Fevers,	163	4	68	2	542	7	257	13	2241	45	7185	81	1422	16	2556	32	17204	240
Eruptive do	2	..	...	.:.	*	...	*	...	53	1	49	...	47	..	52	3	300	5
Lung dis.	12	1	19	4	54	5	52	8	209	23	146	13	118	7	48	4	974	96
Liver dis.	...	...	...	...	6	1	4	..	20	4	7	1	10	2	8	...	77	10
Bowel dis.	30	...	32	3	+77	1	+35	4	704	51	617	34	200	10	397	11	3236	184
Cholera,	41	18	5	4	1	...	17	5	95	57	13	6	41	22	56	31	429	217
Brain dis.	3	...	5	1	*	...	*	...	105	14	26	4	32	6	34	2	267	35
Dropsies,	...	...	1	...	*	...	*	...	64	19	182	32	37	16	256	22	589	102
Rheumat.	91	...	26	...	219	3	120	1	828	14	879	11	456	4	496	8	4470	56
Venereal,	12	...	15	..	*	...	*	...	450	2	329	...	325	2	130	2	1833	10
Eye disease,	30	...	7	...	*	...	*	...	266	5	73	...	93	...	52	...	676	5
Skin dis.	12	...	27	...	*	..	*	...	1037	4	794	1	367	...	357	..	4890	5
Abscess&ul.	164	1	*	...	*	...	*	...	1240	9	1139	2	557	1	599	1	5967	21
Other dis.	24	...	74	1	1660	14	1148	30	1504	54	736	13	386	11	442	15	8209	176
Total,	584	24	279	15	2559	31	1633	61	8816	302	12175	198	4091	97	5483	131	49061	1162

[1] Exclusive of horse artillery in 1831. [2] Exclusive of 1832. [3] Exclusive of 1831 and first half of 1832 and 1841.
[4] Exclusive of 1832 and 1834 and second half of 1833 and 1840. * Included among "other diseases."
† Dysentery and diarrhœa only are included under "diseases of the bowels" at these stations, dyspepsia and obstipatio being put in "other diseases."
‡ They being included with Cannanore.
The numbers prefixed to the names of the stations refer to their arrangement in the text.

TABLE I. *continued.*—Ratio per 1000 of Mean Strength.

	European Troops.								Native Troops.							
	2. Cannanore.		8. St Thomas's Mount.		9. Fort St George.		Total.		1. Mangalore.		3. Calicut.		2. Cannanore, &c.		4. Quilon.	
	Ad.	Died.	Ad.	D.	Ad.	Died.	Ad.	D.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.
Fevers,	233	2·8	202	2·	324	1·3	246	2.	109	2·4	94	1·3	161	2·5	75	·7
Erup do			*		2	·2	‡	...	5	·1	...	...	5	...	3	...
Lung dis.	109	2·5	47	2·2	115	4·2	82	2·9	14	1·9	8	·7	15	1·8	26	·7
Liver dis.	109	5·4	130	5·2	128	6·4	123	5·6	2	·4	...	...	1	·1	3	...
Bowel dis.	404	23·2	†178	8·5	414	14·6	303	13·9	72	4·3	35	1·3	62	4·1	54	1·6
Cholera,	10	2·2	5	1·1	20	10·2	11	4·1	1	·3	2	1·3	7	3·	15	8·2
Brain dis.	16	3·4	*	...	18	1·6	‡	...	4	·5	2½	·7	3	·3	4	1·3
Dropsies,	7	2·2	*	...	9	1·8	‡	...	3	·7	1½	·4	3	·8	2	...
Rheumat.	135		97	...	158		124	...	75		42		72		71	
Ven. affec	261		*	...	371		‡	...	46		26		30		30	
Eye dis.	61	6·7	*	...	64	8·6	‡	...	8	3·	6	2·4	7	3·8	13	1·3
Skin dis.	52		*	6·	19		‡	...	96		54		107		174	
Ab. & ul.	187		*	...	162		‡	...	169		123		144		*	
Other dis.	407		968	6·	468		...	...	106		84		98		222	
Total,	1984	46·4	1647	25·	2212	48·9	1896	37·4	710	13·6	478	8·1	715	16·4	692	13.8
Exclusive of cholera.		44·2		23·9		38·7		33·3		13·3		6·8		13·4		5·6

	Native Troops.																							
	5. Ramnad.		6. Negapatam.		7. Palaveram.		8. St Thomas's Mount.		9. Madras.		10. Masulipatam.		11. Vizagapatam.		12. Chicacole.		Total omitting Mangalore and Calicut.		Corrected ratio of Totals.§		Cavalry in United Kingdom.		Cape Corps (Hottentots.)	
	Ad.	Died.	Ad.	Died.	Ad.	D.	Ad.	D.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	D.	Ad.	Died.	Ad.	Died.
Fevers,	149	3·6	37	1·1	137	1·8	58	3·	110	2·3	526	5·9	194	2·2	421	5·3	222	3·2	222	3·1	75	1·4	66	·7
Erup do	...	...	...	...	*	...	*	...	3		3	...	6	...	9	·5	4	...	4	·1	1½	·1	2	...
Lung dis.	11	·9	10	2·2	14	1·3	12	1·8	10	1·1	11	1·	16	1·	8	·7	12	1·2	12	1·2	145	7·4	105	3·9
Liver dis.	...	...	...	...			1	...	1	·2	...	...	1	·3	1	...	1	·1	1	·1	5	·3	4	·5
Bowel dis.	27	...	18	1·7	21†	·5	8†	·9	35	2·5	46	2·6	27	1·4	65	1·8	42	2·4	45	2·6	74½	·4	84	4·1
Cholera,	37	16·3	3	2·2			4	1·1	5	2·8	1	·4	6	3·	9	5·1	6	2·8	6	2·8	4	1·2	...	...
Brain dis.	3	...	3	·5	*	...	*	...	5	·7	2	·4	5	·8	5	·3	3	·5	4	·5	5	·6	4	...
Dropsies,	...	...	*	...	*	...	*	...	3	·9	13	2·3	5	2·2	42	3·6	8	1·3	9	1·4	1	·2	1	...
Rheumat.	82		14		55	·	27	*	41		64		62		82		57		57	...	48		67	
Ven. affec	11		8		*	...	*	...	22		24		45		21		24		27	...	161		62	
Eye dis.	27	·9	4	·5	*	...	*	...	13	4·4	5	1·9	13	2·4	9	4·3	9	3·5	10	...	19	2·4	28	1·7
Skin dis.	11		15		*	...	*	...	51		58		50		49		62		70	...	29		8	
Ab. & ul.	149		*		*	...	*	...	62		84		76		96		77		86	...	132		90	
Other dis.	22		41		419	4·3	269	7·	74		54		53		74		106		?	...	229		302	
Total,	529	21·7	153	8·2	646	7·9	370	13·8	435	14·9	891	14·5	559	13·3	903	21·6	633	15·	633	15·	929	14·	823	10·9
Exclusive of cholera.		5·4		6·		7·9		12·7		12·1		14·1		10·3		16·5		12·2		12.2		12·8		10·9

* Included among "other diseases." † Dysentery and diarrhœa only are included; dyspepsia and obstipatio being classed among "other diseases."
‡ The data being imperfect, from the omission of St Thomas's Mount, the "total ratio" cannot be calculated for these classes of diseases.
§ In this column we have omitted the strength at Palaveram and St Thomas's Mount in calculating the ratios of the classes of diseases marked * or † at these stations, the strength out of which the cases occurred having been 69126 instead of 77504.

This table shows the amount of sickness and mortality to have been comparatively high among the European soldiers at Fort St George, probably owing to two adventitious circumstances. First, Madras being the sea port at which troops are commonly landed on their first arrival in the Presidency, the admissions have been increased by slight cases of fever arising from exposure to the sun and the effects of dissipation, in which soldiers are too apt to indulge on landing after a long voyage. And, secondly, from it being the port of embarkation for invalids, the proportion of deaths has been raised by fatal cases occurring among them while waiting an opportunity of returning to England. The ratio of mortality has also been greatly increased by the ravages of cholera, which has caused upwards of a fifth of the whole deaths at the station. If we deduct the fatal cases of this disease, of whose course and cause we are still so completely ignorant, Fort St George will be found to hold an intermediate place between Cannanore and St Thomas's Mount.

We regret that the returns relative to Masulipatam do not enable us to classify the diseases as in the preceding table, but, referring to the description of that cantonment, it will be seen that the proportion of deaths is upwards of a fourth higher than at any of the other stations for European troops on the coast. This excess is stated to have been caused chiefly by fever and dysentery, the greater prevalence and intensity of which are accounted for by the position of the fort, in the centre of an extensive marsh, above the surface of which it is elevated but a few feet.

On examining the relative proportion of admissions and deaths by each class of diseases among the Europeans, it will be seen that fevers and diseases of the bowels furnish a third of the admissions, and that the latter and inflammation of the liver are the cause of half the deaths. To the prevention of these three classes, therefore, the attention of medical officers in India should be particularly directed. Fevers, although from their prevalence a source of considerable inefficiency, are by no means very fatal, the proportion of deaths not greatly exceeding that among troops in this country, and being even a fraction under that of the Sepoys at the same stations. In this respect there is a striking contrast between the East and West Indies; fevers in the latter occupying the most prominent position both as regards admissions and deaths. Inflammation of the liver, however, is comparatively a rare disease, and productive of little loss in the West Indies, while in the East it gives rise to a large proportion of sickness and mortality. The troops appear by the above table to enjoy a remarkable exemption from diseases of the lungs compared with any of the places of which the statistics have been investigated, a subject to which we shall hereafter more fully advert.

To enable us to compare the amount of disease and its effects upon the native soldier in India, with other troops serving in their native country, we have annexed to the preceding table the ratios of sickness and mortality among the cavalry in the united kingdom and the Cape mounted rifles, (Hottentots,) being the only available information on the subject.* The results show a most extraordinary uniformity in the mortality, which amounts to 15 per thousand for the Sepoys, 14 per thousand for the cavalry at home, and 11·9 for the Cape corps; or, deducting epidemic cholera, to 12·8 at home, 12·2 in Madras, and 10·9 at the Cape. The ratio of sickness among the Sepoys was considerably increased by the employment in the end of 1835 of a body of 7000 men in Goomsoor, where they suffered greatly from jungle fever of a severe type, and which, on their return, increased the amount of disease at the posts where they were stationed. We are unable to ascertain to what extent this cause operated, or what stations it especially affected; it may be sufficient to state that in the northern (military) division, from which the force was drawn for that service, the admissions rose in 1836 to considerably more than double, and the deaths to treble the usual average; indeed, the latter were more than double the highest ratio in any of the other years from 1829 to 1838.

The class of diseases which has been the most prevalent and most fatal has been fevers, for which, on the aggregate of the stations on the coast, 222 were admitted, and 3·1 died per 1000 of the strength. But this has been materially affected by the stations of Masulipatam and Chicacole. The former we have already pointed out as very unhealthy, both for European and native troops, surrounded as it is with all the supposed sources of malaria; the latter appears to have been one of the stations, the garrison of which suffered severely from the effects of the Goomsoor campaign. Omitting these two stations, the admissions by fevers would amount only to 129, and the deaths to 2· per 1000 of the strength, which, however, are higher ratios than in the united kingdom, or among the native troops at the Cape.

The next class of diseases in point of importance has been those of the bowels, which has caused 45 admissions and 2·6 deaths per 1000. The ratio appears remarkably low in a country where, among Europeans, this class of diseases occupies so prominent a

* These ratios have been calculated from the abstracts in the statistical reports on the health of the army; care has been taken to include in each class only such diseases as are comprised under the same head in the returns of the Madras native troops. It is almost unnecessary to observe that the ratios consequently do not correspond with those published in the reports.

place; but the constitution of the Indian and the nature of his diet no doubt tend to his exemption.

Cholera has proved a source of considerable mortality, and has displayed, as usual, great irregularity in its prevalence at different stations, the deaths varying from 0·3 at Mangalore to 16·3 per 1000 at Ramnad. It has, however, fully maintained its fatal character, 217 out of 429 cases having died.

The exemption from diseases of the lungs which we remarked in the case of the Europeans, has been enjoyed to a still greater extent by the native troops, among whom also diseases of the liver, which were a source of considerable sickness and mortality among the former, are of very rare occurrence.

Beriberi, included in the class of dropsies, deserves especial notice, as having been almost entirely confined to Masulipatam, Vizagapatam, and Chicacole. The admissions at the first of these stations were 130 and the deaths 22, at the second 21, of whom 6 died, and at the last 243 and 16 deaths. Beriberi is chiefly confined to situations near the coast, being rarely seen on the high lands, and is supposed to be of malarious origin, which derives corroboration from its great prevalence at Masulipatam and Chicacole, where the troops were more exposed to that cause of disease than at any of the other stations: it is seldom met with in Europeans.

Reserving our farther remarks on the diseases of the troops till we have considered those in the other divisions, we now proceed briefly to describe,

II. *The Stations on the Plains between the sea coast and mountain ranges.*

1. *Palamcottah*, the most southerly station in this class, is situated in 8° 43′ N. lat., 77° 48′ E. long., on an extensive plain one mile east of the Tambaravary river, at a height of about 120 feet above the level of the sea. The fort stands on a bed of granite, slightly elevated, and for the most part bare of soil. Immediately to the northward are some tanks for irrigating the low grounds. Abundance of water for domestic use is found in the fort at a depth of from 8 to 12 feet. The European artillery barrack is built on the most elevated ground within the fort, and consists of a commodious house with several large airy rooms. The force amounts to 20 men, who have been generally healthy.

The native lines are outside the fort, on an elevated rocky situation. The aggregate strength of the regiment stationed here for 10 years, 1829–38, has been 8094, out of which 3451 admissions and 93 deaths have taken place, being in the proportion of 426 and 11·5 per 1000 annually.

No details are given of the European artillery, nor from the smallness of the force could any satisfactory deductions have been drawn therefrom.

2. *Madura*, situated in 9° 55′ N. lat., 78° 11′ E. long., is a town with a population of 30,000 inhabitants, about 60 miles in a direct line from the sea, and 600 feet above its level; it is enclosed by a wall, and surrounded by a deep ditch. The houses are chiefly built of mud; in the northern part of the town they are large and comfortable; in the southern they are dirty, crowded, and of an inferior description. There are no Sepoy lines, the soldiers living in the south-west corner of the town with the inhabitants. They are stated to keep their houses and the neighbouring streets clean. During ten years, 1829–38, the admissions were 639, and the deaths 20, out of an aggregate strength of 1542, being in the ratio of 414, and 13·0 per 1000 respectively.

3. *Dindigul* is situated in 10° 22′ N. lat., 78° 2′ E. long., in the middle of a plain 25 miles in extent from north to south, and 30 from east to west, surrounded by hills, and about 700 feet above the level of the sea. Five miles south of the town a range of hills, called the Serroo Mullays, rise to the height of about 3500 feet, while the Pulneys, 20 miles west of Dindigul, rise to double that height. On the west side of the town is a remarkable fortified rock 400 feet in length, 300 wide, and 280 feet high, composed of gneiss veined with felspar, and nearly bare of vegetation. It is ascended on the east side by a flight of stone steps; the other sides are perpendicular. The town stands on a gentle slope, the streets are wide, and the houses well built. The Sepoy lines are at the N. W. corner of the town, on the highest part of the slope, and are well drained, dry, and clean. The soil consists principally of a light and dark ferruginous earth lying upon gneiss; and although rice is cultivated near tanks and rivers, the chief product of the district is dry grain. The thermometer in May ranges from 79° to 98°, and in December and January from 66° to 80°. The rains commence in July, and continue at intervals till February. The nights are always comparatively cool. The aggregate strength of the troops during 1833–5–6, and the first half of 1838, amounted to 2255, and furnished 1609 cases, and 19 deaths, being in the ratio of 713 and 8·4 per 1000. Dindigul having been only occasionally occupied by troops, the returns are not available, except for the above years.

4. *Paulghaut* is situated in a gap in the Western Ghauts, in 10° 46′ N. lat., 76° 43′ E. long., at a distance of 45 miles from the Malabar coast, and 800 feet above the level of the sea. The surrounding country is undulating to the foot of the hills, which are

distant 7 miles to the north, and 13 to south; westwards there is a gradual descent towards the sea. The Canady, a river of considerable size, runs about two miles to the north, and the Calpathy, which in the summer is nearly dry, about a mile to the south. Their beds are in some places rocky, in others consist of white sand. There are no tanks in the neighbourhood, but several morasses are to be found at the foot of the hills. The soil around Paulghaut is light and productive, and is highly cultivated; the high grounds consist of red gravel and laterite.

The cantonment stands on slightly undulating and open ground, having the fort, a square fortification, surrounded by a wet ditch 21 feet deep and 15 broad, at the south-east corner. The native lines lie 408 yards north of the fort, consisting of a main street running north and south, 25 feet wide, crossed at right angles by eight streets 15 feet wide, and which are kept clean and well drained. The aggregate strength of the troops during eight years, 1829–38, exclusive of 1832 and 34, was 3896; the admissions amounted to 3274, and the deaths to 42, being in the proportion of 840 per 1000 of the former, and 10·8 of the latter.

5. *Trichinopoly* is situated in 10° 50′ N. lat., 78° 44′ E. long., on the south bank of the Cauvery, 85 miles distant from, and about 250 feet above, the level of the sea. The fort is two or three furlongs from the south-west bank of the river, surrounded by strong walls of solid masonry, in some places double, and from 30 to 40 feet in height. They inclose a native town having a population of 30,000 inhabitants, the houses and huts being generally low, narrow, closely placed together, and having no windows. The flag-staff is placed on the summit of a rock of granite, within the fort, about 500 feet in height, called "The Rock of Trichinopoly." The country around is irrigated in every direction for the cultivation of rice, except to the southward, where the ground is too high to permit it. The soil on the high grounds is rocky, sandy, or gravelly, and of little depth. On the low grounds it is rich and highly productive; in many places near the fort it is a deep black loam, and yields three crops annually. The soil in the low grounds has generally a bottom of deep stiff tenacious red clay with an intermixture of sand.

The mean annual fall of rain does not exceed 30 or 40 inches, and occurs chiefly from August to November; during the remaining eight months, the weather is usually hot and dry, often attended with high winds in May, June, and July. The mean annual temperature at this station is 85½°;* the greatest heat observed in the shade being 102° and the lowest 68°.

* In the preparation of this Report we have implicitly followed the statements in the official documents; but we think it right to observe that this appears remarkably high as a mean annual temperature.

The military cantonment stands on a plain from two to three miles south-west of the fort. The force consists usually of one of H. M. regiments of foot, one company of European artillery, one native cavalry, and four native infantry regiments. The artillery barrack is a spacious, lofty, well ventilated brick building at the western extremity of the cantonment, in an airy and well-raised situation, and affording accommodation for 100 men. A stream of water runs within 200 yards of it, in which the men bathe throughout the greater part of the year. The huts for the married men with their families are defective in size, comfort, and ventilation. The European infantry barracks are half a mile to the eastward of this, built of brick, forming a quadrangle, and calculated for 800 men. They face to the south, and have a spacious gravelly parade in front. The hospital is a lofty well-ventilated building, about 350 yards from the barracks, on the south-west side of the parade, and having an eastern aspect. It scarcely affords sufficient accommodation in sickly seasons.

The cavalry lines are in the centre of the cantonment, near a stream of water; the hutting ground for the men being to the eastward of the horse lines.

The lines for two of the native regiments of infantry are situated at the north-west extremity of the cantonment. The huts form straight, wide, and regular streets, but are said to be too close and crowded, and less healthy than the other lines. The hospitals are described as small, ill ventilated, and low roofed. The lines of the other two regiments form the south-eastern extremity of the cantonment, a mile and a-half apart from the last, and separated from them by a small stream which flows in a tortuous course through the cantonment. The barracks face the south, and stand on an open level plain with a rocky bottom and gravelly surface. The hospitals are 300 yards in rear, raised three feet above the ground, floored with stone, and have compounds round them inclosed by a wall. The Sepoy lines are to the eastward of the hospitals; the huts are of a superior description, and form wide and regular streets, well ventilated, and kept very clean.

The aggregate strength of the European troops at Trichinopoly during ten years, 1829–38, has been 8922, the admissions into hospital have amounted to 15,144, and the deaths to 351. These numbers give a ratio of 1697 and 39.3 per 1000. The admissions have ranged between 1352 in 1830, and 2090 in 1835, and the mortality from 23.9 in 1836 to 78.4 in 1832. The latter ratio, however, was caused by a fatal epidemic of cholera; but for which it would have amounted only to 32.7. The highest mortality, except in 1832, was 48.2 in 1833.

The sickness and mortality among the native troops at Trichinopoly are not stated separately from the other stations in the southern division, and cannot in consequence be made use of in the present report.

6. *Combaconum* is situated in 10° 58′ N. lat., 79° 29′ E. long., at a distance of thirty miles from the sea, in a rich alluvial plain, and close to the Cauvery and Asillar rivers. The surrounding country is extensively irrigated and chiefly under rice cultivation, of which it yields two crops annually. The Sepoy lines, consisting of seventy or eighty huts, are on the bank of the river. The aggregate strength in the ten years 1829–38, was 629 men, among whom 395 admissions and 8 deaths occurred, being in the ratio of 628 and 12.8 per 1000 of the strength.

7. *Coimbatore*, situated in 10° 59′ N. lat., 76° 59′ E. long., at a height of 1483 feet above the level of the sea, is a neatly built town, with wide well-ventilated streets. It is distant about five miles from the hills, and fifteen from the nearest tract of jungle. The climate is much influenced by the winds, which blow through the Paulghaut pass. The north-east monsoon commences about the middle of October. The rains which accompany it cease in the end of December; but the wind prevails with little variation till the end of March, constituting the cool season. From this period till the middle of May the wind is generally from the south or south-east. Westerly winds then set in, bringing on the hot season, during which the thermometer frequently rises to 96° and 98° in the shade, and rarely falls below 79°. After the south-west moonson is established on the Malabar coast, the heat is a little moderated; but the westerly winds continue till September, when the air is often close and sultry, and the winds become variable. From the beginning of June till the end of August the west wind blowing through the funnel formed by the Paulghaut pass sweeps over the adjoining country with great violence.

The Sepoys' huts at Coimbatore are situated close to the town. The aggregate strength of the detachment in seven years, 1832–8, amounted to 878, the admissions into hospital to 566, and the deaths to 9; being in the proportion of 644 and 10.2 per 1000 of the strength annually.

8. *Salem*, in 11° 39′ N. lat., 78° 12′ E. long., lies in the lowest and narrowest part of a valley about seven miles in width, at a height of 907 feet above the level of the sea, from which it is 100 miles distant in a direct line. The hills enclosing the valley terminate about five miles from Salem in an easterly direction; westwards the country is generally open, with the exception of occasional small insulated hills. The Tyromany river forms the northern and western boundaries of the town. Three dams have

been erected across the stream near the town, in the vicinity of which the river occasionally, during the rains, overflows its banks, but without injury to the town, which is well raised above them. There are numerous tanks in the surrounding country which are filled during the monsoon, but become dry between December and March or April. Irrigation is much practised, and cotton, tobacco, and indigo are cultivated to a considerable extent in the district, as well as the ordinary grain crops. The Sheevaroy hills, which approach within five miles of Salem, attain a height of 4190 feet above the level of the town, but their general height may be estimated at 3500 feet.

The prevailing winds are N. E. from the beginning of November till the end of February, when they become variable, but chiefly from S. and S. W. in April and May. From June till October the S. W. monsoon blows steadily, accompanied with frequent and heavy showers; in October the wind again becomes variable till the setting in of the N. E. monsoon, which in November and December brings with it the periodical rains. The range of the thermometer is very considerable at this station, in February and March amounting to as much as 30°.

No account is given of the accommodation for the troops, but it is probable that they reside in the town, occupying the same description of thatched mud houses as the lower classes of the inhabitants. During 10 years, 1829–38, the aggregate strength of the detachment has been 2440; the admissions have amounted to 800, and the deaths to 64; giving the ratios of 328, and 26·2 per 1000 annually.

9. *Arcot* lies in 12° 54′ N. lat., 79° 24′ E. long., 68 miles south-west from Madras, at a height of 558 feet above the sea. It is situated upon high ground, sloping towards the left bank of the Palar river, from which it is 900 yards distant; the nearest hills of any importance are seven miles to the south-west of the cantonment.

The surrounding country is gravelly, and free from luxuriant vegetation, except along the banks of the river, where there are tracts of low irrigated rice fields. About half a mile south-west of the town is a strip of land a mile in length, and 400 yards in breadth, along the bank of the river, thickly planted with mango, date, tamarind, and other trees; there is no jungle within many miles. The bed of the river is sandy; its waters deposit no mud, and during the greater part of the year form a very small stream.

There is accommodation for one European and two native cavalry regiments, but none of the former have been quartered at Arcot for many years past. The lines for the horses are placed parallel to each other, and in advance of the centre is the European barrack, built of brick, and having a tiled roof and brick floor. About 400 yards in rear of the lines are three commodious well ventilated hospitals. The lines for one native regiment are on the right of the cantonment, those for the other being on the west side of the village, which is situated between the cantonment and the banks of the river.

The aggregate strength of the force at Arcot during ten years, 1829–38, has been 7965 cavalry soldiers, among whom the admissions into hospital were 5025, and the deaths 69, being in the proportion of 631, and 8·7 per 1000 annually.

10. *Vellore* lies 12 miles west of Arcot, in 12° 55′ N. lat., 79° 12′ E. long. The fort is three quarters of a mile from the foot of a high range of rocky hills, the skirts of which are planted with palm and date trees, and is surrounded by a broad ditch of considerable depth. The village is situated between the fort and the range of hills, is clean, and tolerably airy, and sufficiently elevated to prevent the lodgment of water. The country around is an extensive plain, surrounded by hills, and well watered by the Palar and by numerous springs. The soil is a rich dark mould, producing abundant crops of rice and tobacco. Around the village there is much natural vegetation, and numerous trees which tend to impede the free circulation of air.

The barracks and hospitals are built within the fort; the Sepoy lines are placed about a quarter of a mile to the north of it, and many of the men reside in the village. The regiments quartered here furnish small detachments to the neighbouring civil stations of Chittoor, Chingleput, and Cuddalore, and the sick of these are included in the head quarter returns. There have been no European troops at this station. The aggregate strength of the native force during ten years, 1829–38, has been 12,433, of whom 5263 have been admitted into hospital, and 111 have died, being in the ratio of 423, and 8·9 per 1000 annually.

11. *Rajahmundry*, situated in 17° N. lat., 81° 50′ E. long., 28 miles from the sea, on somewhat elevated ground, on the left bank of the Godavery, consists of one principal street, running north and south, and about half a mile in length, with narrow streets and lanes branching off. The river here has high banks, is about a mile in breadth during the rainy season, but the rest of the year it is a small stream, generally fordable. Its waters after the rains deposit a large quantity of mud. The rainy season extends from the middle of June till October, when the N. E. monsoon sets in. During the month of March the sea breeze is felt at this station for a few hours in the afternoon.

The fort is built to the north of the town, in the form of a square, having high mud walls, and surrounded by a ditch, now partially filled up. The barrack is a long mud building, with tiled roof, in the south-east corner of the fort. The hospital is a building of similar construction, on the west side of, and close to the barrack. The lines for the Sepoys are immediately in front of the barrack, and consist of four rows of thatched huts of a very inferior description.

The country north and south of the town is low, and the soil consists of black cotton ground, chiefly under rice cultivation; to the eastward it rises gradually, and is sandy, barren, and covered only with a low stunted jungle. The detachment, usually two companies, is furnished by the regiment at Samulcottah, and is changed every three months. The aggregate strength during 13 years, 1829–41, has amounted to 2223; the admissions have been 717, and the deaths 29; the former being in the ratio of 322, and the latter of 13·0 per 1000 annually.

12. *Samulcottah* is situated in 17° 4′ N. lat., 82° 14′ E. long., at a distance of 8 miles from the sea, above the level of which it stands about 70 or 80 feet, and of 30 miles from the foot of the Eastern Ghauts, which rise to a height of 2000 feet.

The fort was levelled to the ground in 1835, in consequence of the offensive state of the ditch, which was at the same time filled up. The cantonment stands on the N. W. side of the town; there are no lakes or rivers of any importance near it, and but few tanks in the neighbourhood; these are generally dried up in the hot season. The soil is alluvial, resting on a bed of gravel, at a depth varying from 6 to 20 feet.

The barracks have been built of brick, on hard gravelly and elevated ground at the south side of the cantonment. The Sepoy lines are laid out to the S. W. of the barracks on gradually rising ground, beyond which is an open plain for some distance. The hospital is situated on the east of the cantonment in a low and objectionable situation, and is too far distant from the men's lines and barracks; it is built of brick with a tiled roof.

The admissions into hospital and deaths during ten years, (1831–41, exclusive of 1832,) have been 3923 and 78 out of an aggregate force of 7613; the former being in the ratio of 515, and the latter of 10·2 per 1000 of mean strength.

13. *Vizianagrum*. This cantonment stands on ground sloping to the northward, in 18° 3′ N. lat., 83° 35′ E. long., at a distance of 12 miles from the sea, and six from several ranges of hills rising from the Eastern Ghauts, and bare, with the exception of a few stunted patches of underwood. The fort and village are about a mile from the cantonment, and separated from it by a large tank which contains water throughout the year. The soil around the station is a deep alluvium, and is almost entirely under cultivation. The weather in April and May is very hot and oppressive, the thermometer often standing as high as 96° during the night—but in the winter months the weather is cool and bracing.

The barracks are built in front of the parade ground, facing the south. On their west side are the officers' quarters, and on the east the hospital, which is a large well constructed building of brick, raised six feet from the ground and surrounded by a wall.

The aggregate strength of the force quartered here during ten years, (1829–40, exclusive of 1830 and 1831,) amounted to 13,053 men, among whom 11,721 admissions and 281 deaths took place, being in the ratio of 898 and 21·5 per 1000 respectively.

14. *Berhampore* is situated in 19° 20′ N. lat., 84° 55′ E. long., on a rocky ledge of ground, surrounded by an extensive plain bounded on the west and north by a range of hills at a distance varying from 5 to 10 miles. The soil of the cantonment is dry and gravelly, and the ledge is of an average height of about 40 feet above the level of the plain. There are no rivers in the vicinity, but there are numerous small tanks on the plain, and several nullahs, which are quite dry except during the monsoon, when they become rapid streams. The hot season extends from the end of March to the end of May, when the thermometer ranges from 75° to 90°; from November to February it ranges from 50° to 75°.

The native lines consist of thatched mud huts, and are open, spacious, and comfortable. On their northern side is the native town, and immediately beyond it a strip of paddy land, and a considerable swamp extending to the foot of the hills.

The ratio of sickness and mortality during eleven years, (1829–41, exclusive of 1831–2,) has amounted to 600 and 15·7 per 1000, the admissions having been 5704, and the deaths 149 out of an aggregate strength of 9505 men.

15. *Russelcondah* is situated in 20° N. lat., 84° 40′ E. long., at an elevation of about 150 feet above the level of the sea. It lies at the foot of a hill; the soil of the plains is alluvial, and for some miles round the cantonment they are under rice cultivation. The surrounding country is hilly, the hills varying from 500 to 2000 feet in height. Two small rivers pass the station, and unite about six miles below it; in the hot season they are dried up, but in the monsoon occasionally overflow their banks. The south-west monsoon sets in about the middle of June, and continues till the middle of October. During March, April, and May, the weather is hot, and the nights oppressive, but it is comparatively cool and pleasant during the rest of the year.

The barracks are situated near the foot of the hill and front to the east. The hospital is in a parallel line with them, is commodious, well ventilated, and has verandahs round it. Both buildings are of brick, and tiled. The Sepoy lines are built on the left bank of one of the rivers already noticed. The cantonment has only been occupied since 1836, after the termination of the Goomsoor campaign. The aggregate strength of the force during five years, 1837–41, has amounted to 4351, out of which 3724 admissions and 66 deaths have occurred, being in the proportion of 856 and 15·1 per 1000 annually.

Having thus briefly described the various stations occupied by troops on the plains between the sea coast and the mountain ranges, we shall now submit the following table, (TABLE II.) showing the amount of sickness and mortality at these stations by the different classes of diseases.

This table shows the sickness and mortality among the European troops at Trichinopoly to have been rather less than the average of the stations on the sea coast. If we deduct the deaths by cholera, which, from the irregularity of its visitations, and in the amount of mortality to which it gives rise on different occasions, may fairly be omitted in estimating the influence of the climate, we find a remarkable similarity in the ratios, being respectively 32·4 and 33·3 per thousand. The classes of diseases, however, by which the admissions and deaths have been produced are somewhat differently distributed, fevers having been more prevalent and fatal at Trichinopoly than at the coast stations, probably owing to the extent to which irrigation is carried around it, and the consequent artificial production of marsh; while it has enjoyed a considerable exemption from diseases of the bowels; and also, though not to so great an extent, from inflammation of the liver. The comparative immunity from diseases of the lungs which we formerly noticed is enjoyed to quite as great an extent at this station, being only a very small fraction above that from pneumonia and catarrh alone among the cavalry in the united kingdom, and less than a third of that from the whole of the diseases of this class.

Among the native troops the admissions have ranged from 321 at Rajahmundry to 898 at Vizianagrum, and the deaths from 8·4 at Dindigul to 26·2 at Salem; or, excluding cholera, from 3·9 at Arcot to 18 at Salem; the average of all the stations giving 609 admissions, and 13·5, or, excluding cholera, 9·9 deaths per 1000 of the strength. The comparatively high ratio of sickness and mortality at Vizianagrum, and also at Berhampore and Russelcondah, may probably have been in a considerable degree produced by the Goomsoor campaign. As we have already stated when speaking of the mortality at Chicacole, the returns

TABLE II.—Showing the principal Classes of Diseases among the Troops at the Stations on the Plains.

	European Troops.		Native Troops.													
Stations.	5. Trichinopoly.		1. Palamcottah.		2. Madura.		3. Dindigul.		4. Paulghaut.		6. Combaconum.		7. Coimbatore.			
Period,	1834–8		1829–38		1829–38		1833–5–6–7		1829–38[1]		1829–38		1832–8			
Strength,	4502		8094		1542		2255		3896		629		878			
	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.		
Fevers	1672	28	1047	13	163	3	430	4	447	9	158	2	220	3		
Erupt. do.	1	...	34	...	13	...	28	...	36	1	1	...	5	...		
Lung dis.	389	10	42	7	9	...	33	3	101	3	6	1	4	1		
Liver dis.	481	15	7	1	...	...	2	..	5	1	...	...	2	...		
Bowel dis.	822	58	247	12	77	3	95	2	322	8	32	1	56	2		
Cholera,	24	11	78	37	17	11	3	3	14	8	5	3	9	2		
Brain dis.	65	10	19	3	7	...	12	3	7	...	2	...	1	...		
Dropsies,	14	1	10	4	2	...	5	2	14	1	2	1	4	1		
Rheumat.	508	5	306	1	51	3	147	1	299	4	32	...	29	...		
Venerl. aff.	1789	6	153	..	43	...	71	...	128	...	15	...	30	..		
Eye disease,	334	...	101	...	27	...	165	...	222	...	18	...	27	...		
Skin dis.	81	...	165	...	22	...	80	...	593	...	34	...	63	...		
Abs. & ulc.	635	2	890	..	*	...	*	...	*	...	*		*	...		
Other dis.	1353	11	352	15	208	...	538	1	1086	7	90	...	116	...		
Total,	8108	157	3451	93	639	20	1609	19	3274	42	395	8	566	9		

	Native Troops.																	
Stations.	8. Salem.		9. Arcot.		10. Vellore.		11. Rajahmundry.		12. Samulcottah.		13. Vizianagrum.		14. Berhampore.		15. Russelcondah.		Total of native troops.	
Period,	1829–38		1829–38		1829–38		1829–41		1831–41[2]		1829–40[3]		1829–41[4]		1837–41			
Strength,	2440		7965		12433		2223		7613		13053		9505		4351		76877	
	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Adm.	D.
Fevers	197	5	1225	8	1497	27	259	13	1298	22	5583	73	2364	34	1866	16	16754	232
Erupt. do.	5	...	*	...	*	...	4	...	83	4	130	...	47	3	104	1	490	9
Lung dis.	23	5	68	7	63	7	16	...	58	6	168	16	78	9	42	5	711	70
Liver dis.	2	1	4	...	5	1	...	...	3	2	18	4	10	4	1	...	59	14
Bowel dis.	73	3	207	†3	137	†12	29	...	198	10	696	26	378	22	176	6	2723	110
Cholera,	35	20	91	38	44	23	22	9	26	9	144	58	64	28	63	27	615	276
Brain dis.	13	6	*	...	*	...	1	...	23	3	37	6	25	6	13	1	160	28
Dropsies,	35	20	*	...	*	...	49	5	105	14	438	54	123	18	29	4	816	124
Rheumat.	83	3	261	2	734	6	88	...	456	2	1047	15	548	8	331	1	4412	46
Venerl. aff.	26	...	*	...	*	...	74	...	286	1	432	5	252	3	117	3	1627	12
Eye disease,	26	...	*	...	*	...	8	...	54	...	161	1	65	...	60	...	934	1
Skin dis.	18	...	*	...	*	...	16	...	336	...	758	1	402	...	157	...	2644	1
Abs. & ulc.	*	...	*	...	*	...	52	...	462	1	1225	5	725	6	486	...	3840	12
Other dis.	264	1	3169	11	2783	35	99	2	535	4	884	17	623	8	279	2	11026	103
Total,	800	64	5025	69	5263	111	717	29	3923	78	11721	281	5704	149	3724	66	46811	1038

* Included with "other diseases." † Dysentery and diarrhœa only are included.
[1] Exclusive of 1832 and 4. [2] Exclusive of 1832. [3] Exclusive of 1830 and 31. [4] Exclusive of 1831 and 32.

TABLE II.—*Continued.* Ratio per 1000 of mean strength.

Stations on the Plains.	European Troops. 5. Trichinopoly. Ad.	Died.	NATIVE TROOPS. 1. Palamcottah. Ad.	Died.	2. Madura. Ad.	Died.	3. Dindigul. Ad.	Died.	4. Paulghaut. Ad.	Died.
Fevers,	371	6.2	129	1.6	106	1.95	190	1.8	115	2.3
Eruptive,	...	...	4	...	9	—	12	..	9	.3
Lung dis.	86	2.2	5	.9	6	—	15	1.3	26	.8
Liver dis.	107	3.3	1	.1	...	...	1	...	1	.3
Bowel dis.	183	12.9	30	1.5	50	1.95	42	.9	83	2.
Cholera,	5	2.5	10	4.5	11	7.15	1½	1.3	4	2.
Brain dis.	15	2.2	2	.4	4	...	5	1.3	2	...
Dropsies,	3	.2	1	.3	1	...	2	.9	4	.3
Rheumat.	113		38		33		65		77	
Ven. affec	397		19		28		32		33	
Eye dis.	74		13		17		73		57	
Skin dis.	18	5.4	20	2.	14	1.95	36	.9	152	2.8
Abs. & ul.	141		110		*		*		*	
Other dis.	301		44		135		239		279	
Total,	1814	34.9	426	11.5	414	13.	713	8.4	840	10.8
Exclus. of Cholera.	...	32.4	...	7.	—	5.85	...	7.1	...	8.8

Stations on the Plains.	6. Combaconum. Ad.	Died.	7. Coimbatore. Ad.	Died.	8. Salem. Ad.	Died.	9. Arcot. Ad.	Died.	10. Vellore. Ad.	Died.	11. Rajahmundry. Ad.	Died.
Fevers,	253	3.2	251	3.4	81	2.05	154	1.	120	2.2	117	5.8
Eruptive,	...	...	6	...	2	...	*	...	*	...	2	..
Lung dis.	10	1.6	4	1.1	9	2.05	9	.9	5	.6	7	...
Liver dis.	...	...	2	...	...	...	...	...	...	...	...	...
Bowel dis.	31	1.6	64	2.3	31	1.6	26	†1.4	12	†1.	13	...
Cholera,	8	4.8	10	2.3	14	8.2	11	4.8	3	1.8	10	4.
Brain dis.	3	...	1	...	5	2.5	*	...	*	..	...	...
Dropsies,	3	1.6	4	1.1	14	8.2	*	...	*	...	22	2.3
Rheumat.	51		33		34		33		50		49	
Ven. affec	24		34		11		*		*		33	
Eye dis.	28		31		11		*		*		3	
Skin dis.	54		72		7	1.6	*	1.6	*	3.3	7	.9
Abs. & ul.	*		*		*		*		*		23	
Other dis.	143		132		109		398		224		45	
Total,	628	12.8	644	10.2	326	26.2	631	8.7	423	8.9	322	13.
Exclus. of Cholera.	...	8.	...	8.1	..	18.	...	3.9	...	7.1	...	9.

Stations on the Plains.	12. Samulcottah. Ad.	Died.	13. Vizianagram. Ad.	Died.	14. Berhampore. Ad.	Died.	15. Russelcondah. Ad.	Died	Total. A.	Died	Total corrected.‡ A.	Dd.
Fevers,	170	2.9	428	5.6	249	3.6	429	3.7	218	3.	218	3.
Eruptive,	12	.5	10	...	5	.3	24	.2	6	.1	9	.2
Lung dis.	8	.8	13	1.2	8	1.	9	1.1	9	.9	9	.9
Liver dis.	...	...	...	...	1	.4	...	...	1	.2	1	.2
Bowel dis.	26	1.6	55	2.3	40	2.3	41	1.4	35	1.4	42	1.7
Cholera,	3	1.2	11	4.4	7	3.	15	6.2	8	3.6	8	3.6
Brain dis.	3	.4	3	.5	3	.6	3	.2	2	.4	3	.5
Dropsies,	14	1.8	33	4.1	13	1.9	7	.9	10	1.6	14	2.2
Rheumat.	60		80		57		76		56		58	...
Ven. affec	37		33		26		27		21		29	...
Eye dis.	7		12		9		14		12		17	...
Skin dis.	44	1.	58	3.4	42	2.6	36	1.4	35	2.3	47	...
Abs. & ul.	61		94		76		111		50		86	...
Other dis.	70		68		64		64		144		...	...
Total,	515	10.2	898	21.5	600	15.7	856	15.1	609	13.5	609	13.5
Exclus. of Cholera.	...	9.	...	17.1	...	12.7	.	8.9	...	9.9	...	9.9

* Included under "other diseases."
† Dysentery and diarrhœa are the only "diseases of the bowels" specified at these stations, dyspepsia and obstipatio being included with "other diseases."
‡ In calculating the ratios in this column, we have omitted the strength at Arcot and Vellore in all those classes of diseases marked * or †: the strength out of which the admissions and deaths took place having been 56479 instead of 76877.


MAP
SHEWING THE PRINCIPAL
MILITARY STATIONS
in the
MADRAS PRESIDENCY.
The Figures under the names of several Stations denote their altitude in feet above the level of the Sea
BERAR
AURUNGABAD
BEEDER
HYDRABAD
ORISSA
CIRCARS
BEEJAPOOR
CONCAN
CANARA
MYSORE
CARNATIC
COCHIN
TRAVANCORE
CEYLON
Kamptee
Nagpore
Jaulnah 1650
Aurungabad
Secunderabad
Hydrabad
Kurnool
Bellary
Gooty
Cuddapah
Nellore
Masulipatam
Guntoor
Rajahmundry
Samulcottah
Vizagapatam
Chicacole
Berhampore
Ganjam
Kistnah R.
Godavery R.
Mahanuddy R.
Goa
Mangalore
Bangalore
French Rocks
Seringapatam
Mysore
Mercara
Cannanore
Tellicherry
Calicut
Coimbatore
Palghaut
Cochin
Quilon
Trivandrum
Cape Comorin
Palamcottah
Ramnad
Ramisseram
Madura
Dindigul
Trichinopoly
Tanjore
Negapatam
Tranquebar
Point Calimere
Palk Strait
Porto Novo
Cuddalore
Pondicherry
Salem
Arnee
Vellore
Wallajahbad
Palaveram
MADRAS
Fort St. George
Poonamallee
Pulicat Lake
Cauvery R.
Toombuddra R.
Engd. by G. Aikman

do not show to what extent the health of the troops has been influenced by this at the different stations, but from the position of Vizianagrum and Berhampore, a considerable portion of the force for that service must have been drawn thence, and the men who became inefficient during the course of it must have been directed on them, while it is also probable they were garrisoned by some of the regiments so employed on their return from that country. Russelcondah, also, having been established for the first time at the termination of that campaign, must necessarily have been occupied by a portion of that force; and as the men had been much exposed to the causes of fever, we might naturally anticipate a considerable amount of sickness among them. This view is confirmed by the higher ratio of fever, which, on the average of all the stations, has been 218, but excluding the three mentioned, does not exceed 139 per 1000. The very high ratio of mortality at Salem, 18 per 1000, exclusive of cholera, was chiefly caused by a large number of cases of beriberi, by which 24 admissions and 17 deaths took place, most of them in 1832 and 1833. The medical officer in his report stated that "nothing satisfactory could be elicited as to the cause of this outbreak of beriberi." Taking the average of all the stations, the ratio both of admissions and deaths among the native troops has been rather lower at the stations on the plains than on the coast. As regards the admissions, there is no material difference in the more important classes of diseases; while as regards the deaths, the stations on the plains have enjoyed a comparative exemption from diseases of the bowels, and also slightly from those of the lungs, but have suffered more from cholera and dropsies.

We shall now proceed to the consideration of

III. *The Stations on the Table Lands.*

1. *Merkara* or *Muddykeree*, the capital of Coorg, is situated in 12°.27′ north latitude, 75°.18′ east longitude, at a height of 4500 feet above the level of the sea, at the south-east angle of an oblong table land, about 18 miles in length by 13 in breadth, and which consists of a succession of low narrow ridges with fertile valleys between. On the east and north the hills have a gentle declivity, and are clothed with wood, but on the south they are precipitous and bare, descending abruptly a depth of 600 feet to the southern division of Coorg. A small river rises near Merkarah, but no lakes or marshes exist in the neighbourhood. "In the vicinity of Merkara the rocks are primitive, consisting mostly of sienite, occasionally traversed by greenstone, the whole being covered with a thick lithomargic earth, composed of felspar in various stages of decomposition, the agglutinating basis being argillaceous earth coloured by oxide of iron. . .

. . . . . . Immediately over the lithomargic earth is a stratum varying greatly in thickness, of rich vegetable mould, resulting from the decomposition of the luxuriant vegetation with which the whole country is clothed during the greater part of the year."

The fort is built on the summit of a small isolated hill, about 150 yards from the boundary ridge of the table-land on the south. The Sepoy lines are below the fort, on the south and south-west slopes of the hill, the huts being constructed of wattle and mud, with thatched roofs.

The climate is mild and equable, the annual range of temperature being from 52° to 82°. The maximum height of the barometer is 26·22 during the dry season, and the minimum 25·91 during the monsoon. The monsoon sets in about the middle of June, and continues during the three following months. The air is very moist, and during the intervals of the rains, dense fogs prevail. In October the weather is usually bright, but the N. E. wind is very cold. November is cold and showery, and in the early part of December fogs are frequent. From this period the weather is fine, the days being cool till March or April, when the heat of the sun becomes oppressive, but the nights are generally pleasant.

The following table shows the mean temperature in each month for two years at 6 A. M. and 10 A. M., and also the fall of rain in inches.

	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	Mean.
Temperature.													
1835-1836, 6 A. M.	66·7	65·4	65	64	65	63	56	53	56	61	64	64	61·9
1835-1836, 10 A. M.	69·9	67·7	68	68	68	67	64	64	69	73	75	72	68·
1836-1837, 6 A. M.	62	62	60	62	63	60	58	56	60	64	65	63	61·25
1836-1837, 10 A. M.	68	64·2	63	67	68	70	70	69	74	76	78	72	69·91
Rain.													
1835-6—inches	44·77	20·80	23·25	13·53	10·24	2·18	...	...	...	0·02	1·87	2·48	119·14
1836-7—inches	20·84	23·74	24·74	7·02	0·55	1·55	0·07	...	...	1·29	0·21	7·64	87·65

The prevailing winds from April to October are W. N. W.; and from October to February, N. E. and E. N. E.; in March they are variable.

The detachment of European artillery at Merkara, consisting of 22 men, has been quartered in the lower storey of the Rajah's Palace within the fort; no details are given regarding the state of their health. The aggregate of the native force employed there from 1835 to 1843 inclusive, amounted to 8902 men, of whom 5131 were admitted into hospital, and 72 died, being in the ratio of 576, and 8·1 per 1000 of mean strength annually.

2. *The French Rocks* is a station seven miles north-west of Seringapatam, and lies in 12° 39′ N. lat., 76° 50′ E. long., on gently rising ground, at an elevation of 2300 feet above the level of the sea. The surrounding country is hilly, rocky, and barren, and intersected by numerous deep ravines; two ranges of hills rise at some little distance to the east and north-east of the station, the former running in a northerly, and the latter in a north-westerly direction. The soil is gravelly, with a few patches of light red loam. There are no jungles, marshes, or swamps, and but a very small extent of irrigated land in the immediate neighbourhood of the cantonment.

The climate is moist, and, during the first quarter of the year, heavy dews and fogs are frequent. The hot season extends from the middle of February to the middle of June; but the thermometer seldom rises above 85°, and the nights and mornings are cool. About the latter period the south-west monsoon sets in, and the rains continue till the middle of September. The north-east monsoon is also generally accompanied with heavy rain. In December and January the weather is cold, the thermometer seldom rising above 72° at noon, and falling as low as 50° at sunrise.

The barrack stands in the centre of the cantonment, facing the south; in its rear is the hospital, a substantial tiled building, raised two feet from the ground, and having verandahs in front and rear of eight feet in breadth. The Sepoy lines are behind the hospital, separated from the other parts of the cantonment by a road. The streets are stated to be broad and clean, and the huts comfortable and in good repair.

The native force does not exceed one battalion. The aggregate strength for nine years, 1833–41, was 7891, among whom the admissions into hospital have amounted to 5322, and the deaths to 141, being in the ratio of 674 and 17·9 per 1000.

Seringapatam was formerly the capital of Mysore, and the head-quarters of the troops; but was abandoned on account of the fatal endemic fever which prevailed among both Europeans and natives.

3. *Bangalore*, the head quarters of the Mysore division of the army, is situated in 12° 57′ N. lat., 77° 38′ E. long., on one of the highest ridges of table land in that country, at a height of 3000 feet above the level of the sea, and nearly midway between the Malabar and Coromandel coasts. The country surrounding the cantonment is generally barren, and the ground undulating and intersected with deep ravines. The soil throughout the district of Bangalore is dry and gravelly, but tolerably productive. The hills are chiefly composed of granite, gneiss, and

hornblende; the nearest jungle is about fifteen miles distant from the station in a south-westerly direction.

The climate is generally cool and pleasant. The south-west monsoon commences about June and continues till the beginning of September, constituting the wet season. The temperature ranges from 64°, the minimum, in January, to 89°, the maximum, in May; the extreme daily range varies from 8° to 12°. On the average of five years ending 1835, the mean temperature within doors was 75°, in the open air 83°. The quantity of rain which fell in 1835 was 44 inches.

The ridge on which the cantonment stands runs east and west, and slopes to the north and south. At the east end lies the village of Ulsoor, in a low position, from which the ground rises gradually. On the highest portion of the ridge, to the extreme right, are the barracks of the horse artillery, and a little lower those of the foot artillery. Next are those of the European cavalry and infantry, then of the native infantry, while the native cavalry lines are thrown back to the northward, near the Ulsoor Tank. The European cavalry barracks consist of eight ranges of brick buildings, one for each troop, surrounded by a wall nine feet in height; the ground slopes gently, thereby preventing the accumulation of water near them. The horse lines are placed between the barracks and the Ulsoor tank. The European infantry barracks are inferior to the cavalry; they are built in the form of a square, and in consequence of having no verandah, the rooms are hot during the day. The hospital is in rear of the barracks, built of brick, with floors raised three feet from the ground. Immediately behind the infantry barracks is the public bazaar, near the western end of which the Sepoys are hutted. The force at Bangalore usually consists of one regiment of European and one of native cavalry, one troop of European and one of native horse artillery, one company of European foot artillery, one regiment of European and two to four of native infantry.

During ten years, 1829–38, the aggregate strength of European soldiers amounted to 15,590, among whom 25,425 admissions and 437 deaths took place; the former being 1631 and the latter 28 per 1000 of the mean strength annually. The proportion of admissions has varied between 1280 in 1832 and 2369 in 1833, and the deaths between 19·1 in 1832 and 34·7 in 1829.

The admissions and deaths among the native troops have not been stated separately for Bangalore, but have been included with the other stations in the Mysore division. The total strength in that country, during ten years, 1829–38, amounted to 70,016, the admissions to 46,976, and the deaths

to 991, giving the relative proportions of 671 and 14·1 per 1000 annually.

4. *Hurryhur* is situated in 14° 29′ N. lat., 75° 52′ E. long., on an extensive plain about a mile from the right bank of the Toombuddra river, at an elevation of 1830 feet above the level of the sea, from which it is 90 miles distant. The surrounding country is clear and open to a distance of from 8 to 16 miles, and there are no marshy lands in the vicinity. The cantonment stands on a sandy or gravelly soil; that of the neighbouring country is either black cotton earth or a red sand irregularly distributed.

Except in May and June, previous to the setting in of the south-west monsoon, the climate is pleasantly cool. The greatest fall of rain takes place during the north-east monsoon, and strong winds prevail during both.

The Sepoy lines run east and west, and present a gradual descent towards the river. The hospital is a commodious building in rear of the lines, raised about 18 inches above the ground. The aggregate strength of the native troops during ten years, 1832–41, has been 8500 men, of whom 5020 have been admitted into hospital, and 103 have died, being in the ratio of 591 admissions and 12·1 deaths per 1000 annually.

5. *Cuddapah* is situated in 14° 32′ N. lat., 78° 54′ E. long., on the table land between the Eastern and Western Ghauts, at an elevation of 507 feet above the level of the sea. The cantonment, which is separated from the town by a small river, stands on a gentle declivity, from three to six miles from the hills on the north-east and south, and having an extensive open plain on the west, stretching to the foot of the hills at a distance of thirty miles. Cuddapah is intersected by two nullahs; the one immediately in front of the regimental lines, the other and larger one on the west side of the town; the streams unite and fall into the Pennar, four miles north of the station. The soil in the valley of Cuddapah is light and sandy, consisting of the debris of the neighbouring hills, but in the plains to the west and north it is a rich black cotton ground. The hills and likewise the banks of the streams are covered with a low dense jungle and long rank grass, and there are numerous tanks throughout the district. From its vicinity to the hills, which rise to a height of 1000 to 1500 feet, the heat at Cuddapah is very great, attended with closeness and stagnation of the air at night; the mean annual temperature being 81½°, the maximum 98°, and the minimum 65°. The south-west monsoon sets in early in June, and lasts till September, attended with oppressive calms at night and partial rains. In the end of October the north-east mon-

soon begins with heavy rains, which continue till the end of November; the weather is then cool and pleasant till February or March, after which the hot season commences and lasts till the setting in of the S. W. monsoon. The heat is intensely felt, owing to the radiation from the surrounding hills.

The barracks are two substantial brick buildings, parallel to each other, which stand on a gentle slope, the soil being sandy. The hospital is to the left of these, on low ground where water lodges during heavy rains, and the floor is not sufficiently raised. The Sepoy lines are situated in rear of the barracks, and between them and the river. The strength of the native troops during nine and a-half years, 1829–41, amounted to 8483, the admissions into hospital, to 5930, and the deaths to 123; being in the ratio of 699 and 14.5 per 1000. Of the deaths, however, 62 occurred from cholera, which being deducted would reduce the ratio of mortality at this station to 7.2 per 1000.

6. *Bellary* is situated in 15° 5′ N. lat., 76° 59′ E. long., at an elevation of 1182 feet above the level of the sea, and at a distance of about 180 miles from the Ghauts on either side. The plain around the station is flat, free from jungle, and but little cultivated, bounded to the west at a distance of six miles by a low range of barren hills. There are no rivers or marshy grounds near the cantonment. The soil is red and gravelly to the distance of a mile, but the prevailing soil throughout the plain is black cotton ground. The climate is characterized by extreme dryness; the quantity of rain in 1841 amounted only to $26\frac{4}{10}$ inches, and in 1842 to $17\frac{6}{10}$. The prevailing winds are from the west and north-west from March to November, and from the east and south-east in December, January, and February. In the cold season the temperature occasionally falls below 50° at sunrise. The hottest months are March, April, and May, during which the average temperature at noon ranges between 92° and 99°, the nights and mornings are, however, comparatively cool.

The fort of Bellary covers a bare granite hill of an oblong form, stretching north and south, about two miles in circumference, and 450 feet in height, and presenting a bold and precipitous aspect on its eastern and southern sides, but on its western sloping gradually towards the plain. A few hundred yards to the north is a ridge of similar bare rugged rocks, and at a short distance to the east are several smaller ridges of the same character. They are all of granitic formation, and chiefly composed of felspar and ferruginous hornblende. There are two lines of works on the rock, constituting the upper and the lower forts. In the upper are the cells for prisoners, in the lower the barracks for H. M. regiment and the European artillery, the arsenal, stores, &c. About 100 yards from the fort on the south side is a large tank, which when full is upwards of three miles in circumference; but during the dry season is reduced to half that size, and the ground thus exposed is said to give rise to noxious exhalations. There are two European barracks within the fort; one on high ground close to the ramparts on the south side, and overlooking the tank; the other on lower ground on the north side. They are built in the form of a square, have verandahs round them, and tiled roofs. About 100 yards from the first of these, upon high ground close to the base of the rock, stands the artillery barrack, forming three sides of a square. The European hospital is situated about a mile to the west of the fort, in an open dry plain, and can accommodate 130 patients. The barracks for the native troops are about a mile and a half to the south-west of the fort, built of stone, with tiled roofs, and having a southern exposure. They afford accommodation for three infantry and one cavalry regiments. The hospitals consist of three buildings adjoining the barracks. The Sepoy lines are situated at a short distance from the rock on its western side.

During ten years, 1829–38, the strength of the European troops at this station amounted to 9020, the admissions into hospital to 17,992, and the deaths to 285; being in the proportion of 1995 of the former and 31.6 per 1000 of the latter. The returns of the native troops at Bellary have not been given separate from the other stations in the Ceded districts. Including the force at Cuddapah, already described, and two companies at Ghooty, formerly a place of importance, but now falling into decay, the aggregate strength has amounted in ten years, 1829–38, to 35,999; among whom 17,804 admissions and 581 deaths have occurred; being in the ratio of 495 and 16.1 respectively.

7. *Kurnool* is situated in 15° 50′ N. lat., 78° 6′ E. long., at a height of 900 feet above the level of the sea, on an angle of land formed by the junction of the rivers Henderry and Toombuddra. The fort and town lie in a hollow, the ground to the west and north rising gently for a mile and a half, while about five miles to the eastward there is a low range of hills, and on the south a wedge-shaped hill about four miles distant. The hills near the station are sandstone; and the soil in the neighbourhood chiefly black cotton ground upon limestone. The prevailing winds are west and north-east. The mean annual temperature is about 80° degrees. During April, May, and June, which are the hottest months, the thermometer ranges from 86° to 98°, and in the cool season from 64° to 78°.

The fort stands on the south bank of the Toombuddra; its walls are seventeen feet high, built of limestone and sandstone. The river flows past the northern and eastern faces, and a deep broad dry ditch runs from west to south. The regimental lines extend over a plain 300 yards from the west gate of the fort, and separated from the Toombuddra by the village of Nova Pettah. The barracks are within the fort near the west gate. The hospital stands near the east gate, and is a well-ventilated building, calculated to accommodate 30 patients.

The station of Kurnool has been occupied since 1839, when the principality was taken possession of by the British, in consequence of the treasonable designs of the Nabob. In three years, 1840–42, the strength has amounted to 3810, out of which 2040 admissions and 37 deaths have taken place, being in the proportion of 535 and 9·7 per 1000 annually.

8. *Secunderabad*, the head-quarters of the Hyderabad subsidiary force, stands 6 miles north of the city of Hyderabad, in 17° 26′ N. lat., 78° 32′ E. long., at an elevation of 1837 feet above the level of the sea. The surrounding country is wild and picturesque, being interspersed with small hillocks of granite. At a distance of three miles to the west is a range of hills consisting of granite rocks heaped one on the other, and to the north-east are two very remarkable large granite hills of hemispherical shape, about three miles asunder, and perfectly isolated. The soil on the higher grounds is chiefly silicious. The whole country is studded with tanks, which are used for irrigation.

The south-west monsoon sets in about the beginning of June, and lasts till the middle of October. The annual fall of rain at Secunderabad is estimated at 32 inches, but in years when the monsoon fails it does not amount to half that quantity. The daily range of the thermometer from November to February is very considerable, amounting to from 20° to 30° in the shade.

The cantonment extends nearly three miles in length. At the east end are the European infantry barracks, built on the side of a hill sloping gently to the eastward. They are surrounded by high land, except towards the south-west, where there is a low swampy plain interspersed with tanks, stagnant pools, and rice fields, and having a date plantation extending to within 500 yards of the barrack wall; at a distance of about 100 yards to the north-west is the crowded burying-ground for the Queen's troops. The soil on which the barracks stand is a reddish clay mixed with decomposed granite. The hospital is situated on higher ground 400 yards to the west of the barracks, and is a brick building with tile roof, and surrounded by enclosed verandahs. A little farther west are the lines of the officers of the regiment. West of the European lines are those of the four native regiments, with the hospitals and barracks in front. The horse ar-

tillery lines lie to the north-west, while the foot artillery are north of those of the infantry, on higher ground, and about a mile distant. They are separated from the horse artillery by a narrow strip of low rice ground. From one to two miles north is a small range of hills about 150 feet in height. At the south-western end of the cantonment is an extensive sheet of water called the "Hussain Saugor" tank, to the eastward of which is a tract of cultivated rice ground about eight miles in length.

The cavalry lines are at Bowenpilly, two miles north of the cantonment, in an open country and on dry elevated ground.

The European troops at Secunderabad, (including a troop of horse artillery at Jaulnah,) have, during ten years, 1829–38, amounted to an aggregate strength of 10,557, among whom the admissions into hospital have been 22,933 and the deaths 664, being in the proportion of 2172 and 62·9 per 1000 annually. The strength of the native force at Secunderabad and Jaulnah for the same period has been 81,042 men, of whom 46,478 have been admitted, and 1207 have died, being in the ratio of 573, and 14·9 per 1000 respectively.

9. *Jaulnah* is situated in 19° 50′ N. lat., 76° E. long., in the province of Aurungabad, 1650 feet above the level of the sea, on the left bank of the River Koondulka, which in the dry season is a very small stream, but during the monsoon comes down with great violence. The surrounding country is hilly, intersected with numerous ravines and extensive tracts of waste stony land, covered with long grass. The soil in the vicinity of the station is chiefly cotton ground with patches of red gravel.

The hot season lasts from March to June, during which the temperature in the middle of the day ranges from 90° to 100°, but it is comparatively cool in the mornings. The monsoon extends from July to October, with a partial cessation of the rains in September; the average annual fall of rain is 32 inches. From November to February comprises the cold season, when the thermometer ranges between 40° and 80°. The prevailing winds are from the west in the hot season; from the north and east during the cold season.

The cantonment stands on a gently-sloping declivity, and is capable of affording accommodation for one troop of European horse artillery, one regiment of native cavalry, and three of native infantry; two of the lines for native regiments are, however, unoccupied. The cavalry lines are at the south-east end of the cantonment, the barracks facing to the north. The officers' houses are in rear of the barracks, and the Sepoys' huts 200 yards behind them. The hospital is at the extreme end of the barracks, well elevated, and capable of accommodating 80 or

100 patients. The infantry lines are in the centre of the cantonment. The Sepoys' huts are in rear of the hospital, and are laid out in regular streets, admitting of a free circulation of air through them. The European artillery barracks are at the north-west end, and occupy the highest ground in the cantonment, the country in front being open for several miles. A branch of the Koondulka runs close to the left. The whole of the site is well drained, the ground having a natural slope towards the river.

The returns do not state the sickness and mortality among the troops at Jaulnah separately from those at Secunderabad, and we have consequently been compelled to include them together. The following statement, however, of the admissions and deaths among the European horse artillery during 11 years, (1829 to 1841, exclusive of 1831 and 1835,) shows the mortality to have been much lower than that of the troops at these two stations combined. The aggregate strength for that period amounted to 1219, the admissions to 3443, and the deaths to 39, being in the ratio of 2824 and 32· per 1000 annually.

10. *Kamptee*, the station occupied by the subsidiary force in the Rajah of Nagpore's country, is situated in 21° 15′ N. lat., 79° 14′ E. long., on the right bank of the River Kunnan, and ten miles east of Nagpore the capital, at an elevation of 900 feet above the level of the sea. The surrounding country is flat, destitute of wood, and much intersected by ravines. The soil is chiefly black cotton ground, except the site of the cantonment, which is clay. The cold season commences about the end of October and continues till the middle of March; the thermometer at sunrise has been observed at this season to be as low as 36°. From the middle of March till about 10th June constitutes the hot season; the rains then set in, and continue with occasional intervals of a few days till the return of the cold season. The greatest amount falls in August and September, the annual average being 40 inches. The prevailing winds during the cold season are N. and N. E., and during the hot, W. and S. W. In April the west wind blows for several hours during the day with considerable force, and is denominated the hot land wind.

The subsidiary force consists of one regiment of native cavalry, one troop European horse artillery, one battalion of foot artillery, one regiment of European, and four regiments of native infantry. The cavalry barrack and lines are at the east end of the cantonment; those of the native infantry are in the centre, while those of the Europeans are at the west end. The last are lofty, commodious, and situated on high ground. Adjacent are the barracks of the horse artillery, and in the same line further west those of the foot artillery, and a small well ventilated hospital and barracks for the troop of native horse artillery. The buildings are all described as well constructed, comfortable, and healthy.

During ten years, 1829–38, the European force amounted to 9574 men, among whom 23,092 admissions and 377 deaths occurred, being in the annual ratio of 2412 and 39·4 per 1000. During the same period the strength of the native force was 49,313, of whom 30,765 were admitted into hospital, and 619 died, giving a proportion of 624 of the former, and 12·5 of the latter per 1000 of the strength.

Having now briefly described the stations on the table lands, we shall submit the usual table (Table III.) showing the classes of diseases by which the sickness and mortality at these have been occasioned.

This table shows the sickness among the European troops to have ranged between 1673 at Bangalore, and 2438 at Kamptee, and the mortality between 22·7 at Bangalore, and 82·1 at Secunderabad and Jaulnah, the average of all the stations on the table lands being 2082 admissions and 41 deaths per 1000 of mean strength. The mortality at Secunderabad, however, has been more than double that of any of the other stations; omitting it from the calculation the average amounts only to 29·2, being very little higher than at the Mauritius or the Bermudas. The excess at Secunderabad has been caused chiefly by dysentery, which, during the period under review, gave rise to a higher ratio of mortality than that from all causes at the other stations on the table lands. It has been a source of great sickness and mortality among the Europeans ever since Secunderabad was first occupied in 1804, and committees have at different times been appointed to investigate into the causes of it, but without any satisfactory result. The unhealthy character of the station has been attributed by some medical officers to "an endemial malarious condition of the atmosphere, occurring at a season when the vicissitudes of climate and the diurnal ranges of temperature are very great." It is worthy of remark, however, that the great excess of dysentery has occurred among Her Majesty's regiments, while the European artillery have been comparatively exempt from it. Thus, out of an aggregate strength of 7561 of the former, during ten years, (1829–39, exclusive of 1833,) 2100 cases of this disease were admitted and 306 died, being in the ratio of 278 and 40·5 respectively; while among the Honourable Company's artillery, out of a strength of 1382, only 262 admissions and 21 deaths took place, or 190 of the former and 15·2 of the latter per 1000 of mean strength. Other observers at-

TABLE III.—Showing the principal Classes of Diseases among the Troops at the Stations on the Table Lands.

EUROPEAN TROOPS.

	3. Bangalore. Ad.	D.	6. Bellary. Ad.	Died.	8 and 9. Secunderabad and Jaulnah. Ad.	D.	10. Kamptee. Ad.	D.	Total. Ad.	D.
Period,	1834-8		1834-8		1834-8		1834-8			
Strength,	8069		4582		4962		5670		23283	
Fevers,	1499	21	2426	27	3768	40	3012	49	11605	137
Erupt. do.	13	1	1	...	7	1	7	...	28	2
Lung dis.	504	13	446	13	271	9	311	7	1492	42
Liver dis.	681	36	569	22	932	62	607	15	2789	135
Bowel dis.	1656	68	1175	42	2301	243	1190	48	6331	401
Cholera,	78	2	69	19	64	8	47	9	251	38
Brain dis.	81	7	29	10	55	11	90	12	255	40
Dropsies,	29	2	10	1	42	10	43	3	124	16
Rheumat.	708		787		406		941		2842	
Venerl. aff.	2895		1453		1186		1420		6964	
Eye disease,	299		635		166		114		1214	
Skin disease	125	33	39	23	47	15	33	45	244	116
Ab. and ulc.	1966		568		377		424		2575	
Other dis.	3724		1709		1725		3218		10376	
Total,	13498	183	9619	157	11347	399	12366	188	47030	927

NATIVE TROOPS.

	1. Merkarah. Ad.	Died.	2. French Rocks. Ad.	Died.	Mysore Division, p. 36. Ad.	D.	4. Hurryhur. Ad.	Died.	5. Cuddapah. Ad.	Died.	6 and 5. Bellary and Cuddapah. Ad.	D.	7. Kurnool. Ad.	Died.	8 and 9. Secunderabad and Jaulnah. Ad.	D.	10. Kamptee. Ad.	D.	Total omitting French Rocks, Hurryhur, and Cuddapah.† Ad.	D.
Period,	1835-43		1833-41		1834-8		1839-41		1829-41*		1834-8		1840		1834-8		1834-8			
Strength,	8902		7891		35381		8500		8483		15594		3810		36744		23496		123929	
Fevers,	1642	19	2325	16	11336	160	1824	20	2948	20	4883	69	685	2	15717	208	10255	126	44537	584
Erupt. do.	55	1	75	...	533	2	49	2	67	2	82	...	57	...	233	2	262	3	1222	8
Lung dis.	96	11	94	8	612	39	244	17	71	13	99	26	16	3	965	38	167	24	1255	141
Liver dis.	4	...	3	1	33	3	3	1	5	...	8	3	2	—	32	1	18	1	97	8
Bowel dis.	330	13	267	29	2013	93	304	13	238	4	492	10	180	5	1505	109	764	41	5274	271
Cholera,	7	4	162	66	71	28	69	24	136	62	271	108	40	19	390	171	38	21	817	331
Brain dis.	56	5	20	3	118	16	30	4	34	4	32	3	11	...	85	11	38	3	354	32
Dropsies,	52	6	15	8	70	23	13	4	40	6	40	6	8	4	122	25	82	21	374	85
Rheumat.	374		432		2054		437		476		858		236		1655		1263		6467	
Venerl. aff.	163		156		711		218		391		379		168		573		293		2287	
Eye disease,	43		204		698		168		167		219		51		340		181		1532	
Skin disease	603	13	367	10	1684	81	350	18	187	12	344	30	71	4	745	90	299	61	3746	279
Ab. and ulc.	776		665		3240		694		771		1089		188		2201		1336		8839	
Other dis.	953		543		3892		626		439		1244		327		3303		1558		11277	
Total,	5131	72	5329	141	27065	439	5050	103	5930	123	10083	255	2040	37	27166	655	16554	301	89030	1739

* Exclusive of 3½ years, but the reports do not state which. † The two former being included in the Mysore division, and the latter with Bellary.
The figures prefixed to the names of the stations refer to their arrangement in the text.

TABLE III. *continued*.—Ratio per 1000 of Mean Strength.

EUROPEAN TROOPS.

	3. Bangalore. Ad.	Died.	6. Bellary. Ad.	D.	8 and 9. Secunderabad and Jaulnah. Ad.	D.	10. Kamptee. Ad.	D.	Total. Ad.	D.
Fevers,	186	2·6	529	5.9	775	8·2	770	9·6	514	6·1
Erupt. do.	2	·1			1	·2	1	...	1	·1
Lung dis.	62	1·6	99	2·8	56	1·9	61	1·4	66	1·9
Liver dis.	84	4·5	111	4·8	192	12·7	120	3·	121	6·
Bowel dis.	205	8·4	256	9·2	473	50·	236	9·5	280	17·6
Cholera,	10	·25	14	4·2	13	1·6	9	1·8	11	1·7
Brain dis.	10	·9	6	2·2	11	2·3	16	2·3	11	1·8
Dropsies,	4	·25	2	·2	9	2·1	8	·6	6	·7
Rheumat.	88		172		84		186		126	
Venerl. aff.	359		319		244		280		306	
Eye dis.	37	4·1	139	·5·	34	3·1	22	8·9	54	5·1
Skin dis.	15		9		10		7		11	
Ab. and ulc.	150		124		77		84		114	
Other dis.	461		373		355		635		459	
Total,	1673	22·7	2143	34·3	2334	82·1	2438	37·1	2082	41·
Exclusive of cholera.		22·4		30·1		80·5		35·3		39·3

NATIVE TROOPS.

	1. Merkara. Ad.	D.	2. French Rocks. Ad.	D.	Mysore Division, p. 35. Ad.	D.	4. Hurryhur. Ad.	D.	5. Cuddapah. Ad.	D.	6 and 5. Bellary and Cuddapah. Ad.	D.	7. Kurnool. Ad.	D.	8 and 9. Secunderabad and Jaulnah. Ad.	D.	10. Kamptee. Ad.	D.	Total omitting French Rocks, Hurryhur, and Cuddapah.* Ad.	D.
Fevers,	182	2·1	295	2·	321	4·6	214	2·3	348	2·4	314	4·4	180	·5	428	5·7	436	5·4	359	4·7
Erupt. do.	6	·1	9	...	15		6	·2	8	·2	5	—	15	...	6		11	·1	10	·1
Lung dis.	11	1·2	12	1·	17	1·1	29	2·	8	1·5	6	1·6	4	·8	7	1·	7	1·	10	1·1
Liver dis.					1	·1									1					·1
Bowel dis.	37	1·5	34	3·8	57	2·6	36	1·6	28	·5	32	·2	48	1·3	41	3·	33	1·8	43	2·2
Cholera,	1	·5	20	8·4	2	·8	7	2·9	16	7·3	17	7·	10	5·	11	4·7	2	·9	7	2·8
Brain dis.	6	·6	3	·4	3	·3	3	·5	4	·5	3	·2	3	—	2	·3	2	·1	3	·3
Dropsies,	6	·7	2	1·	2	·7	1	·5	5	·7	2	·4	2	1·	3	·7	4	·9	3	·7
Rheumat.	42		55		58		51		56		57		62		46		54		52	
Venerl. aff.	18		19		20		26		46		24		44		16		12		18	
Eye dis.	5	1·4	26	1·3	19	2·2	20	2·1	13	1·4	14	1·9	13	1·1	9	2·4	8	2·6	13	2·2
Skin dis.	68		46		48		41		22		22		19		20		13		30	
Ab. and ulc.	87		84		92		82		91		70		49		60		56		71	
Other dis.	107		69		110		74		54		80		86		89		66		91	
Total,	576	8·1	674	17·9	765	12·4	594	12·1	699	14·5	646	16·3	535	9·7	739	17·8	704	12·8	710	14·2
Exclusive of cholera.		7·6		9·5		11·6		9·2		7·2		9·3		4·7		13·1		11·9		11·4

* French Rocks and Hurryhur being already included in the Mysore division, and Cuddapah with Bellary.
The figures prefixed to the names of the stations refer to their arrangement in the text.

tributed the sickly condition of the troops to the situation and faulty construction of the barracks. Considerable alterations were, in consequence, made in them, and the drainage was improved, apparently at first with some benefit ; but in 1843, Her Majesty's 4th regiment suffered to as great an extent as any that had preceded it. The position of the barracks, nearly surrounded by high land which intercepts the free current of air, and on the border of a low swampy plain interspersed with tanks, stagnant pools, and rice fields, all fertile sources of malaria, seems the most probable cause of the unhealthy state of the troops. This opinion is much strengthened by the fact, that the cavalry quartered at Bowenpilly, two miles north of the cantonment are stated to have been generally very healthy; but we have no specific returns on the subject.

The troops at Kamptee have suffered considerably from fever, which prevailed to a great extent in 1834. There is nothing in the position of the cantonment to which this can be attributed. The source to which it is generally referred is the dense and extensive tracts of jungle by which the station is surrounded, although at a distance of upwards of 10 miles.

The results of the stations on the table lands generally are satisfactory, as showing that posts may be selected where European troops shall be exposed to a rate of mortality in a tropical climate not greatly exceeding that to which they are subject at home. Even Kamptee, although less favourable than the others, illustrates the advantage of a judicious selection of a site. When the subsidiary force was first sent into this country, they were quartered close to the capital; but the situation proving very unhealthy, they were moved to Kamptee, and have suffered less from sickness than at their first station.

The native troops have suffered to a greater extent at Secunderabad than at any of the other stations, and, as with the Europeans, Kamptee has stood the next in point of mortality. They have enjoyed the same marked exemption from hepatic inflammation, which has been already shown to exist on the coast and plains, and which, with dysentery, forms the most striking point of contrast with the Europeans. The immunity from pulmonary disease, which is one of the most remarkable features in the sanitary condition of the troops in India, exists even in a more marked degree than at the stations we have already examined. The general results show the same favourable condition of the health of the native army, the mortality from all causes amounting only to 14·2, or within a fraction the same as among troops in the united kingdom, and, exclusive of cholera, only to 11·4 per 1000 of mean strength.

There still remain to be described those stations which, for reasons already stated, we have classed under the head of

IV. *Peculiar Stations.*

1. *Cuddalore,* the depot for European pensioners, is situated on the sea coast, close to the Fort of St David, in 11° 45′ north latitude, 79° 50′ east longitude, about a mile from the embouchure of the Panaur. This river runs parallel to the beach for a distance of three or four miles, separated from the sea by a sand bank, in some places only a few hundred yards in breadth; it flows through Cuddalore, separating the old from the new town. The new town stands on a semicircular tract of land lying between the Panaur and a branch given off by it a few miles higher up, and which here rejoins it. The tide flows several miles up the river, which in the hot season has rather the character of an inlet of the sea than of a river, and at low water a muddy bank of considerable extent is exposed. Cuddalore stands on a sandy soil mixed with clay; the surrounding country is open, level, and free from jungle. There are numerous tanks in the neighbourhood, and irrigation is carried to a considerable extent. The pensioners, amounting usually to about 250, live in the old town, with their families, in neatly built houses laid out in streets and having each a garden attached. They perform no military duty, but are under the control of an officer in charge of the depot. The admissions into hospital during nine years, (1829—38, exclusive of 1832,) amounted to 1369, and the deaths to 135, out of an aggregate strength of 2269, being in the ratio of 603 and 59·5 per 1000 annually. This very low ratio of admissions for Europeans in India doubtless arises from the circumstance of their having no duty to perform, and, in consequence, not being compelled to come into hospital unless they are seriously ill. The mortality is nearly double the average of the stations on the coast. On examining the table of admissions and deaths on page 50, it will be observed that while there is a slight diminution of the mortality from fevers and inflammation of the liver, there is an increase in all the other classes, but especially in those of the lungs, the brain, dropsies, and " other diseases." The information regarding the pensioners is not sufficiently detailed to enable us to enter at length upon the subject; but these facts are interesting, as illustrative of the influence of age and long residence in India in modifying the character of the fatal diseases among soldiers.

2. *Vizagapatam.*—This station has already been described among the " stations on the sea coast ;" it remains for us, therefore, only to notice the amount of sickness and mortality among the European veterans. Out of an aggregate strength of 2937

men during a period of thirteen years (1829–41,) there occurred 2728 admissions and 197 deaths, being in the ratio of 929 and 67·1 per 1000 of mean strength annually. This is higher than what occurs among the European pensioners at Cuddalore; but as no information is given in the reports relative to the duties of the veterans, we are unable to say how far these may have exerted an influence upon the results. On reference to the table on page 50, the chief difference in the classes of fatal diseases will be found to consist in the greater mortality at Vizagapatam, from diseases of the bowels, cholera, and diseases of the brain, while there is a slight comparative exemption from those of the lungs and from hepatitis. This table also shows the very fatal influence of dropsies on the old soldiers, the ratio of deaths from them amounting to 7·2 per 1000 annually. As they have been included with "other diseases" at Cuddalore, we cannot ascertain whether they exert a similar influence upon the pensioners there. The great mortality from diseases of the brain is attributed by the medical officers to the amount of intemperance, which at this station is stated to be excessive.

3. *Wallajahbad* is situated in 12° 48′ N. lat., 79° 39′ E. long., about 30 miles inland, on ground rising a little above the surrounding plain, and about 500 yards from the north bank of the Palar. The village lies to the south-east of the cantonment, at a distance of about half a mile, and is well drained and tolerably clean and airy.

The soil in the neighbourhood is sandy mixed with a marly clay, with granite rocks interspersed; and the country is partially covered by a thin stunted jungle. There is a large tank on the north of the cantonment, which is used for the irrigation of some rice fields; with the exception of these, however, there is little vegetation around the station. Between Wallajahbad and the coast are several small bare hills of granite, none of which rise to a height of above 500 feet. The climate very much resembles that of Madras, but the temperature is a little higher, and the influence of the sea breeze is by no means so strongly felt. The bed of the river is sandy, and for eight months of the year nearly dry.

The barracks are built of brick and mud in the form of a square. The site is low; the floors of the building are not raised, and the ventilation is very defective.

Wallajahbad was formerly the station of one European and one or two native regiments, but the Europeans were withdrawn on account of its extremely unhealthy character. It is now occupied by a native veteran battalion and by the Drumboy establishment. In six years 1833–8, the admissions among the veterans amounted to 1498 and the deaths to 105 out of an aggregate strength of 5455, being in the ratio of 275 and 19.3 per 1000 of mean strength annually. The classes of diseases by which this mortality was occasioned are shown in the table on page 50. The increase above the usual proportion at stations on the plains will be found chiefly in the diseases of the lungs, bowels, and brain, and in those classed under the head of "other diseases."

The information relative to the Drumboy establishment is very defective. The boys are all Indo-Britons; their average numbers has been 114 during the 6 years 1833–8; the admissions into hospital have amounted to 1411, and the deaths to 10; being in the annual ratio of 2057 and 14·6 per 100 of mean strength. Cholera has been the most fatal disease, having given rise to a mortality of 5·9 per 1000 annually. Deducting this from the total, the ratio amounts only to 8·7 per 1000, a result which tends to corroborate the conclusions obtained in other countries as to the immunity from fatal disease enjoyed about the period of puberty.

4. *Poonamallee*, the depot of H. M. troops in this Presidency, is situated 13 miles due west of Fort St George. The country around is flat, sandy, and free from marshes. The barracks stand at the west-end of the cantonment, and are capable of accommodating 500 men. They form an oblong square, are well ventilated, and are provided with verandahs. The old fort lies 400 yards to the east of the barracks, and contains cells for solitary confinement, the magazine, stores for clothing and arms, and the hospital. The native village lies about 600 yards south-east of the fort, and is tolerably airy and clean; the detachment of Sepoys, usually 200 strong, reside with their wives and families in it. The European troops at this station consist of recruits from England, and of invalids proceeding home, and vary in number from 100 to 500 men. The recruits generally arrive about September and October, and remain till after the N. E. monsoon; the invalids come down from the interior about the end of the year. During 10 years, 1829–38, the admissions have been 4425, and the deaths 103, out of an aggregate strength of 1833; being in the ratio of 2414 and 56·2 per 1000 annually. In the following table (Table IV.) are shown the classes of diseases by which this sickness and mortality have been occasioned; but from the nature of the force, and the impossibility of separating the diseases of the recruits from those of the invalids, we fear no accurate deductions can be drawn as to the influence of the climate of this station upon their health.

TABLE IV.—Showing the principal Classes of Diseases among the Veterans and Pensioners, and at the Drumboy Establishment, and the Depot at Poonamallee.

	Stations.										Ratio per 1000 of mean strength.									
	1. Cuddalore. European Pensioners.		2. Vizagapatam. European Veterans.		3. Wallajahbad Native Veterans.		3. Wallajahbad. Drumboy Establishment.		4. Poonamallee Depot.		1. Cuddalore.		2. Vizagapatam.		3. Wallajahbad.		3. Wallajahbad. Drumboys.		4. Poonamallee.	
Period,	1829–38.[1]		1829–41.		1833–8.		1833–8.		1829–38.											
Strength,	2269		2937		5455		686		1833											
	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.
Fevers,	73	5	154	7	522	19	201	2	584	8	32	2·2	53	2·4	96	3·5	293	2·9	319	4·4
Eruptive fevers,	*	...	2	...	*	...	*	...	*	...	*	...		...	*	...	*	...	*	...
Diseases of lungs,	93	20	116	17	43	11	30	...	394	29	41	8·8	39	5·8	8	2·	44	...	215	15·9
" of liver,	138	9	115	6	2	1	4	...	438	11	1	4·	39	2·	...	·2	6	...	239	6·
" of bowels,	†212	34	763	64	†103	13	†112	2	†535	23	†93	15·	260	21·6	†19	2·4	†163	2·9	†292	12·5
Cholera,	10	6	23	15	31	17	11	4	8	5	5	2·6	8	5·1	6	3·1	16	5·9	4	2·7
Diseases of brain,	34	11	126	29	*	...	*	...	*	...	15	4·9	43	9·9	*	...	*	...	...	...
Dropsies,	*	...	81	21	*	...	*	...	22	5	*	..	28	7·2	*	...	*	...	12	2·7
Rheumatism,	204		239		127		24	...	460		90		82		23		35		251	
Venereal affections,	*		155		*		...	...	268		*		53		*		*		146	
Diseases of eyes,	*	50	16	38	*	44	...	...	*	22	*	22·	6	12·9	*	8·1	*	2·9	...	12·
" skin,	*		33		*		...	...	*		*		11		*		*		...	
Abscesses and ulcers,	*		*		*		...	...	*		*		*		*		*		...	
Other diseases,	605		905		670		1029	2	1716		266		307		123		1500		936	
Total,	1369	135	2728	197	1498	105	1411	10	4425	103	603	59·5	929	67·1	275	19·3	2057	14·6	2414	56·2
Exclusive of cholera,												56·9		62·		16·2		8·7		53·5

[1] Exclusive of 1832.

* Included under other diseases.

† Dysentery and diarrhœa only—dyspepsia and obstipatio being included with "other diseases."

The figures prefixed to the names of the stations refer to their arrangement in the text.

We shall now proceed to make a few remarks on the more prevalent diseases among the troops at the various stations, and first of

Fevers.

The following table shows the admissions and deaths by each type of fever in each of the three classes of stations.

	Stations on	Sea coast.			Plains.			Table lands.		
		Adm.	D.	Propor.	Adm.	D.	Propor.	Adm.	D.	Propor.
Europeans.	Ephemeral,	800	2	1 in 400	78	...	0 in 78	866	2	1 in 433
	Quotid. inter.	476	6	1 in 79	98	1	1 in 98	5178	36	1 in 144
	Tertian,	72	1	1 in 72	137	3	1 in 46	1528	8	1 in 191
	Remittent,	289	8	1 in 36	10	2	1 in 5	600	45	1 in 13
	Continued,	2055	13	1 in 158	1349	22	1 in 61	3433	46	1 in 74
	Total,	3692	30	1 in 123	1672	28	1 in 60	11605	137	1 in 85
	Ratio,	246	2	...	371	6.2	...	514	6.1	...
Natives.	Ephemeral,	5430	29	1 in 187	3672	7	1 in 524	9279	29	1 in 320
	Quotid. inter.	10248	146	1 in 70	11414	145	1 in 79	27743	331	1 in 84
	Tertian,	779	3	1 in 260	378	2	1 in 189	3310	26	1 in 127
	Remittent,	288	32	1 in 9	763	36	1 in 21	2505	115	1 in 22
	Continued,	451	30	1 in 15	527	42	2 in 25	1690	83	1 in 20
	Total,	17204	240	1 in 72	16754	232	1 in 72	44527	584	1 in 76
	Ratio,	222	3.1	...	218	3.	...	359	4.7	...

From this table it appears that both among the Europeans and natives, fevers have been more prevalent and fatal at the stations on the table lands than at those on the coast or plains, a circumstance which shows that in India mere elevation above the level of the sea is not of itself sufficient to procure exemption from this class of diseases. On examining the prevalent types of fever among the European troops, ephemeral and continued will be found to have predominated on the coast in the proportion of three-fourths, and at the stations on the plains of five-sixths of the admissions by this class of diseases, while on the table lands two-fifths of the cases have been paroxysmal fevers. By reference to Table 45 III. on page ~~77~~, it will be seen that of the stations on the table lands Bangalore is comparatively exempt from fevers, while the proportion is very high at Bellary, Secunderabad, and Kamptee. There is, however, this marked difference between the latter, that at Bellary one-third only of the cases are of a paroxysmal type, but at Secunderabad three-fourths, and at Kamptee five-sixths are of that character. This difference is, we think, sufficiently explained by reference to the description of these stations; the country around Bellary being free from marshy ground, with the exception of the tank to the south-east of the fort; while Secunderabad, on the other hand, has been shown to abound in the alleged causes of fever. The cause of paroxysmal fever being prevalent at Kamptee is not quite so obvious, unless it arise from miasm generated in the numerous ravines and nullahs by which the country is intersected. This view as regards Secunderabad is corroborated by the want of success which has attended the alterations in the barracks. From a consideration of the difference in the nature of fevers at these stations, we would infer that measures tending to improve the barrack accommodation, and ameliorate the condition of the soldier at Bellary, would probably be attended with a diminution in the prevalence of these diseases, while, owing to their endemic origin at Secunderabad, the only measure appears to be that of removal to a more healthy locality. That such is to be found in the neighbourhood is proved by the health enjoyed by the cavalry at Bowenpilly, and by the Nizam's troops at Bolarum; the question therefore resolves itself into one of humanity and economy.

The excess of fevers among the Europeans, compared with the natives, is not so great as to lead to the supposition that it is a disease peculiarly affecting immigrants,—persons not indigenous to the country. There is, however, a very marked difference in the prevalent type in the two races. At the stations on the coast two-thirds of the cases among the natives have been paroxysmal fevers, while among the Europeans they have scarcely amounted to one-fourth; on the plains the proportion has been three-fourths among the natives, and about one-sixth among the Europeans; and on the table lands the relative proportions have been three-fourths and three-fifths respectively. Thus the prevailing form appears to be paroxysmal among the natives, and, with the exception of the table lands, continued among the Europeans. It is also interesting to observe, that the relative amount of paroxysmal fevers among the natives is very nearly the same in all the three classes of stations, and that the intensity of these diseases also very closely approximates, the proportion of deaths to admissions by fevers of all types ranging between 1 in 72 and 1 in 76.

The results shown by this table tend to disprove the theory, that the severe and fatal forms of fever by which Europeans suffer so much in the West Indies are the offspring of excessive heat and moisture alone. Were these alleged causes adequate to produce such an effect, then we ought to meet with remittent fever in its most aggravated form in the East, where the temperature is higher and the fall of rain greater than in the West;

and where in very many of the stations the refreshing influence of the sea breeze is not experienced. Such, however, is not the case, remittent fever being a source of but little sickness and mortality among the European troops, and during the period included in the reports before us, never having prevailed to a serious extent as an epidemic.

Eruptive Fevers.

This class of diseases has been a source of very little sickness and mortality. During five years, 1834–8, the admissions among the whole European force serving in the Presidency amounted only to 1 per 1000 of the strength, and among the native troops during the same period to $7\frac{1}{2}$ per 1000, whereof three-fourths were cases of chicken-pox. The results in regard to small-pox are most satisfactory, as showing the exemption of the army in India from this dreadful scourge, and affording strong evidence of the success which has attended the measures adopted for the vaccination of the natives. During ten years, 1829–38, the admissions into hospital for small-pox among the European soldiers throughout the Madras army amounted only to 11, and the deaths to 1 in every 100,000 of the strength, and among the native soldiers during the same period the admissions were 73, and the deaths 7 out of the same numbers.

Diseases of the Lungs.

The admissions and deaths by this class of diseases have been as follows.

	Stations on	Sea Coast.			Plains.			Table Lands.		
		A d	D.	Propor.	Ad.	D.	Propor.	Ad.	D.	Propor.
Europeans.	Inflamma. of lungs,	239	12	1 in 20	194	3	1 in 65	466	14	1 in 33
	Catarrh, .	902	11	1 in 82	163	4	1 in 41	909	9	1 in 101
	Consumption, .	43	19	1 in $2\frac{1}{4}$	2	1	1 in 2	50	16	1 in 3
	Asthma, .	38	...	0 in 38	12	2	1 in 6	32	...	0 in 32
	Difficulty of breathing	13	1	1 in 13	18	...	0 in 18	35	3	1 in 12
	Total,	1235	43	1 in 29	389	10	1 in 39	1492	42	2 in 71
	Ratio per 1000,	82	2.9	...	86	2.2	...	66	1.9	...
Natives.	Inflamma. of lungs,	83	19	1 in $4\frac{1}{4}$	70	12	1 in 6	149	33	2 in 9
	Catarrh, .	505	30	1 in $16\frac{2}{3}$	314	9	1 in 35	725	33	1 in 22
	Consumption, .	74	29	2 in 5	48	28	1 in $1\frac{1}{2}$	57	33	1 in $1\frac{2}{3}$
	Asthma, .	244	15	1 in 16	230	18	1 in 13	244	24	1 in 10
	Difficulty of breathing	68	3	1 in 23	49	3	1 in 16	80	18	2 in 9
	Total,	974	96	1 in 10	711	70	1 in 10	1255	141	1 in 9
	Ratio per 1000,	12	1.2	...	9	.9	...	10	1.1	...

This table shows the mortality among the European troops by diseases of the lungs to have been lowest at the stations on the table lands, and highest at those on the coast. This result, however, has been considerably influenced by the number of deaths at Madras, where the ratio by this class of diseases was nearly double that of the other stations, owing probably to the number of invalids who are assembled there at stated periods for embarkation to England. Omitting Madras, the mortality at the stations on the coast amounts to 2.3 per 1000, or almost the same as at those on the plain. The ratio both of admissions and deaths among the European troops is lower than what occurs among them when serving in their native country. The native troops have enjoyed a still greater immunity than the Europeans from this class of diseases, but particularly in the number of admissions. It is interesting in this particular to observe the influence of race on the character of the diseases from which exemption is thus enjoyed. If we classify the cases into inflammatory, including inflammation of the lungs and catarrh, and non-inflammatory, comprising consumption, asthma, and difficulty of breathing, we find that it is in the inflammatory that the difference almost entirely exists. This will be clearly seen from the following table, showing the admissions and deaths per 1000 of mean strength, divided in this manner.

Stations on	Sea Coast.				Plains.				Table Lands.			
	European.		Natives.		European.		Natives.		European		Natives.	
Ratio per 1000.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.	Ad.	D.
Inflammation of lungs and catarrh,	76	1.5	7	.6	79	1.5	5	.3	61	1.	7	.5
Consumption, asthma, and difficulty of breathing,	6	1.4	5	.6	7	.7	4	.6	5	.9	3	.6

Thus it appears that a very marked difference exists in the prevalence and mortality of the inflammatory affections of the lungs, but that, allowance being made for the increased number of deaths from the invalids at Madras, the proportion of the non-inflammatory is nearly the same among Europeans and natives.

One of the most striking features in diseases of the lungs in this presidency is the low ratio of mortality as compared with other colonies, and the difference is chiefly to be found among those we have classed as non-inflammatory. The most important, because the most generally diffused and most fatal of these, is consumption, and in it, therefore, the difference will be found. As this is a subject of general interest, we submit the following

statement of the admissions and deaths at the principal colonies by this disease, from 1830 to 1836 inclusive, compared with those among the troops in the Madras Presidency.

	Strength.	Admitted.	Died.	Ratio per 1000	
				Ad.	Died
United Kingdom, - - -	44,611	286	236	6	5·3
Gibraltar, - -	22,868	187	139	8	6·1
Malta, - - - - - -	15,031	101	54	4	3·6
Ionian Islands, - - -	24,401	129	79	5	3·2
Bermuda, - - - -	5,894	47	38	8	6·4
Nova Scotia and New Brunswick,	16,082	109	89	7	5·5
Canada, - - - -	19,989	151	109	8	5·4
Cape of Good Hope, - - -	6,957	34	17	5	2·4
Do. Frontiers,	2,883	9	6	3	2.1
Do. Hottentots,*	4,136	14	10	3	2·4
W. and L. Command, - -	33,839	389	218	11	6·4
Do. Black troops,	9,442	65	49	7	5·2
Jamaica, - - - -	18,817	253	139	13	7·4
Do. Black troops, - -	2,008	7	6	3½	3·
Mauritius, - - - -	13,162	96	51	7	3·9
Ceylon, - - - - - -	14,590	78	51	5	3·5
Madras. Europeans. Sea Coast, - -	14,992	43	19	3	1·3
Madras. Europeans. Plains, - - - -	4,502	2	1	½	·2
Madras. Europeans. Table Lands, - -	22,583	50	16	2	·7
Madras. Natives. Sea Coast, - - -	77,504	74	29	1	·4
Madras. Natives. Plains, - - -	176,877	48	28	[illegible]	·4
Madras. Natives. Table Lands, - -	23,929	57	33	[illegible]	·3

This table clearly shows the low ratio of consumption among the troops in Madras, both European and native. But it may be alleged that, consumption being a chronic disease, this result, as regards mortality, may have been to a slight extent influenced by men labouring under it being sent home as invalids. The information with regard to the diseases for which they are invalided is not sufficiently detailed to enable us to enter minutely into that question, but it still warrants us in concluding that this will not account for the low rate of mortality. In ten years, 1829–38, the ratio per 1000 of the mean strength of European troops throughout the presidency, invalided for "thoracic diseases" was 2, and of native troops 0·6 annually, a proportion as regards Europeans the same as that which occurs at Gibraltar, and lower than at any colony except the Ionian Islands and Jamaica.

These results sufficiently show that the exemption from consumption in the East is not one dependent on race but resulting from climate. But while we state this as our opinion, we are

* For a period of thirteen years, 1822–34.

unable to offer any satisfactory explanation of the fact. Those who maintain that marsh miasma is a specific against tubercular consumption will doubtless attribute it to the extent of marsh, which is met with through the greater part of the presidency. But if so, how are we to account for its prevalence in the West Indies, where the antidote is equally abundant, while the colony in which the mortality from it is lowest is the Cape of Good Hope, which is remarkably free from all sources of miasm?

The frequency of consumption in the West Indies has been attributed by some to the influence of the sea breeze in checking the profuse perspiration which attends the slightest exertion in the heat of the sun; but such a result is not obvious in India. It is also worthy of remark that the mortality is exactly the same among the native troops on the coast and table lands, although the range of the thermometer at the latter is much greater, and the temperature during several months is considerably under that of the low grounds.

The results in the preceding table are of practical value in assisting the physician to select a climate suited for patients predisposed to pulmonary consumption. It was at one time the practice to send such to the West Indies; but statistical investigations have shown that, *cæteris paribus*, they were there exposed to even greater risk from it than at home. In India, however, the reverse is the case, and there is no British colony which appears so suitable or so likely to prove beneficial to this class of patients.

Diseases of the Liver.
Under this head are comprised

Stations on	Sea Coast.			Plains.			Table Lands.		
	Ad.	D.	Prop.	Ad.	D.	Prop.	Ad.	D.	Prop.
Europeans. Acute infla. }	1842	84	1 in 22	439	14	1 in 31	2269	105	1 in 22
" Chronic do. }				42	1	1 in 42	460	30	1 in 15
Total, .	1842	84	1 in 22	481	15	1 in 32	2729	135	1 in 20
Ratio, .	123	5·6		107	3·3	...	121	6·	...
Natives. Inflammation,	77	10	1 in 8	59	14	1 in 4	97	8	1 in 12
Ratio, .	1	·1	...	1	·2	...	1	·1	...

This table shows a remarkable diversity both in the prevalence and mortality of inflammation of the liver among the European as compared with the native troops. Among the latter it is so very trifling as scarcely to require notice, while it is more

prevalent and more fatal among the Europeans than in any other of our colonies. The same feature is found in the case of troops in the West Indies, where the negroes enjoy a considerable exemption compared with the Europeans. These results may be influenced to some extent by the mode of living and habits of the two classes of troops, especially as regards the use of intoxicating liquors; but this is by no means adequate to explain the difference. The proportion of cases among the Europeans has been very nearly the same on the table lands as the sea coast, and the deaths have been even a little higher. Among the native troops the exemption has been enjoyed alike in all the divisions.

Diseases of the Bowels.

	Stations on	Sea Coast.			Plains.			Table Lands.		
		Ad.	D.	Propor	Ad.	D.	Propor.	Ad.	D.	Propor
Europeans.	Acute dysentery,	2664	174	1 in 15	642	54	1 in 12	3465	340	1 in 10
	Chronic do.	71	11	2 in 13	8	3	1 in 2⅔	179	18	1 in 10
	Diarrhœa, .	1322	21	1 in 63	70	..	0 in 70	1685	34	1 in 50
	Total, .	4057	206	1 in 20	720	57	1 in 13	5329	392	1 in 14
	Ratio, .	271	13·7	.	160	12·7	...	236	17·4	...
Natives.	Dysentery, .	832	88	2 in 19	719	55	1 in 13	1267	142	1 in 9
	Diarrhœa, .	1181	72	1 in 16	914	44	1 in 21	2476	84	1 in 29
	Total, .	2013	160	1 in 13	1633	99	2 in 33	3743	226	1 in 17
	Ratio, .	26	2·1	...	21	1·3	...	30	1·8	...

Diseases of the bowels, though less prevalent among the European troops than fevers, are more fatal, being the cause of upwards of two-fifths of the mortality. The great majority of the cases are dysentery and diarrhœa, and it will be observed that these have proved most fatal at the stations on the table lands, a result attributable to the great prevalence and fatal character of dysentery at Secunderabad. During five years, 1834–8, the admissions at that station by dysentery alone amounted to 1591, and the deaths to 235, being in the ratio of 327 and 48·3 per 1000 of mean strength. We have already stated our opinion of the necessity of removing the troops quartered there to a more healthy situation, on account of the endemic fever from which they suffer, and this fearful mortality from malarious dysentery greatly strengthens our opinion. If Secunderabad be omitted, the admissions at the other stations on the table lands by dysentery and diarrhœa amount only to 186, and the deaths to 8·6 per 1000 of the strength. It appears, therefore, highly expedient to remove the European troops from this garrison. Among the coast stations dysentery is nearly twice as fatal at Cannanore as at any of the others, and has of late years been on the increase.

Dysentery and diarrhœa are not sources of great sickness or mortality among the native troops, a circumstance which may perhaps in some measure be attributable to their habits of living.

Dyspepsia and constipation, the other two diseases included under this class, do not give rise to a large proportion of admissions or deaths among the troops. They are more prevalent at those stations at which we have found fever and dysentery to abound than at the others. The ratio among the native troops is very slightly higher than among the troops in the united kingdom. The mortality from these two diseases does not amount to more than 3 deaths in every 10,000 of the strength, and is almost exactly the same among Europeans and natives.

Cholera.

A reference to the tables in the preceding pages will show to what extent cholera has been a source of sickness and mortality at the different stations. The information contained in the reports relative to the various outbreaks of this disease is so scanty that we are unable satisfactorily to enter upon the subject.

Diseases of the Brain.

The following diseases have been included under this class.

Stations on	Sea Coast.			Plains.			Table Lands.		
	Ad.	D.	Prop.	Ad.	D.	Prop.	Ad.	D.	Prop.
Apoplexy,	9	8	8 in 9	11	7	2 in 3	37	20	1 in 2
Palsy,	24	...	0 in 24	27	2	2 in 27	81	13	1 in 6
Epilepsy,	61	1	1 in 61	24	1	1 in 24	107	5	1 in 22
Fatuity,	19	...	0 in 19	3	...	0 in 3	5	..	0 in 5
Madness,	25	3	1 in 8	...	...	...	25	2	2 in 25
Total,	138	12	2 in 22	65	10	2 in 13	255	40	2 in 13
Ratio per 1000,	17	1·5	...	15	2·2	...	11	1·8	...
Apoplexy,	16	10	2 in 3	16	12	3 in 4	15	9	2 in 3
Palsy,	106	10	2 in 21	59	10	1 in 6	119	11	1 in 11
Epilepsy,	28	6	2 in 9	19	3	1 in 6	58	5	1 in 12
Fatuity,	45	6	2 in 15	19	1	1 in 19	45	3	1 in 15
Madness,	72	3	1 in 24	47	2	2 in 47	117	4	1 in 29
Total,	267	35	2 in 15	160	28	1 in 6	354	32	1 in 11
Ratio per 1000,	4	·5	..	3	·5	...	3	·3	...

The ratio of admissions and deaths among the native troops corresponds very closely with that in the United Kingdom, and the intensity of the diseases is exactly the same, the proportion of deaths to admissions being 1 in 8. Among the European troops the ratio is rather more than thrice as high as when serving in their native country.

In the preceding table we have not inserted *delirium tremens,* because in the returns from several stations it has been included among "other diseases." On calculating the ratio at those stations from which the returns are available, we find the admissions in the five years 1834–8 to have amounted to 17, and the deaths to 0·7 per 1000 of mean strength. This is a higher proportion of cases than in any of the colonies, except the Windward and Leeward Command and Mauritius. But high as the ratio is, it still presents too favourable a view of the amount of intemperance among the European troops in Madras, for during the same period there have been admitted into hospital at these stations, 1987 cases under the head of "ebrietas," being in the ratio of 54 per 1000 of mean strength. From the general return for the Madras Presidency, it appears that in ten years, 1829–38, the admissions by *delirium tremens* averaged 31½, and the deaths 0·5 per 1000 annually among the European soldiers; while among the natives the cases did not quite amount to 0·2, and the deaths to 0·01 per 1000 of mean strength. During the same period the admissions for "ebrietas" were 49 per 1000 of the Europeans, and none occurred among the natives. While the preceding results show a considerable diminution in the cases of *delirium tremens* during the last five years of the period, they afford melancholy evidence that intemperance is still a very prevalent vice among the European troops in India. There can be little doubt that this was greatly fostered by the practice of issuing a daily spirit ration to each soldier, thereby training him to habits of intemperance. We understand that this pernicious custom has now been abolished in India, as it was in the other British possessions in 1830 by Lord Hardinge, then Secretary at War. The soldier is too willing to fly to the bottle to drown his cares and relieve the dull monotony of his career, without any such encouragement as the gratuitous distribution of spirits.

Dropsies.

Under this head are comprised,

	Stations on	Sea Coast.			Plains.			Table Lands.		
		Ad.	D.	Propor	Ad.	D.	Propor	Ad.	D.	Propor
Europeans.	Subcutaneous dropsy.	51	12	1 in 4	13	1	1 in 13	81	9	1 in 9
	Abdominal dropsy,	14	4	2 in 7	1	...	0 in 1	41	7	1 in 6
	Beriberi, . .	...	...	...	...	...	...	2	...	0 in 2
	Total,	65	16	1 in 4	14	1	1 in 14	124	16	1 in 8
	Ratio per 1000,	8	·2	...	3	·2	...	6	·7	...
Natives.	Subcutaneous dropsy.	159	42	1 in 4	107	14	1 in 8	276	58	1 in 5
	Abdominal dropsy,	31	14	1 in 2	32	13	2 in 5	29	12	2 in 5
	Beriberi, . .	399	46	1 in 8	677	97	1 in 7	69	15	2 in 9
	Total,	589	102	1 in 6	816	124	2 in 13	374	85	2 in 9
	Ratio per 1000,	8	1·3	...	14	2·2	...	3	·7	...

This class of diseases has not given rise to much sickness and mortality among the Europeans; except at the stations on the coast the ratio is lower than among the troops in the West Indies, and at all the stations it is lower than in Ceylon. The natives have suffered to a considerable extent from beriberi, a disease from which the Europeans have been almost exempt, two cases only having occurred out of the whole force. It has been confined almost entirely to the stations on the coast and plains, between the 16th and 20th degrees of latitude, a circumstance pointed out by Mr Malcolmson in his admirable essay on this disease.* Exceptions to this rule will be found in the occurrence of 24 cases at Salem, of which 17 died; of 31 at Secunderabad, whereof 5 were fatal; and of 22 at Kamptee, 6 of which died. Several of these, however, were in men recently arrived from the coast. One or two isolated cases have occurred at other stations. The following statement of the number of admissions and deaths at each of the stations within the above limits may perhaps be considered interesting.

	Admitted.	Died.		Admitted.	Died.
Masulipatam, ...	130	22	Vizianagrum, ...	418	50
Vizagapatam, ...	21	6	Berhampore,......	92	12
Chicacole, ...	243	16	Russelcondah, ...	16	4
Rajahmundry, ...	38	3			
Samulcottah, ...	81	11	Total,	589	124

If the ratios of these numbers be calculated upon the aggregate strength of the stations at which the cases occurred, we find the admissions to be 9 and the deaths 1·9 per 1000 annually. The causes which give rise to this disease are still involved in obscurity and a long and patient accumulation of facts is the only means likely to throw light upon the subject.

* A Practical Essay on the History and Treatment of Berberi, by Assistant Surgeon J. G. Malcolmson, Madras Medical Establishment. Madras, 1835.

Rheumatism

has prevailed among the native troops to nearly the same extent at all the classes of stations, ranging between 52 per 1000 on the table lands, and 58 per 1000 on the plains. These ratios hold an intermediate place between those of troops in the United Kingdom and the Cape corps at the Cape of Good Hope, which are respectively 48 and 67 per 1000 of the strength.

The ratio of admissions among the Europeans has been rather more than double that of the native soldiers. It amounted to 113 per 1000 at Trichinopoly, 124 at the stations on the table lands, and 126 on the sea coast.

It will be found from the tables in the preceding pages, that while among the Europeans diseases of the eyes considerably exceed in frequency those of the skin, the reverse is the case with the natives. In the United Kingdom, as with the Sepoys in their native country, the affections of the skin predominate over those of the eyes. The amount of skin diseases among the Europeans in Madras is very low, particularly when we consider the important functions the skin performs in warm climates, and the constant stimulus of heat to which it is exposed.

Having concluded these observations on the principal classes of diseases, we think it necessary to observe that the sickness and mortality shown in the preceding pages is only that to which the troops are subject at the various stations therein described. The losses by death in the field and on the march have not been included, as the reports from which this paper has been drawn up do not afford any information on these points. We trust that the Statistical Report on the health of H. M. army in India, in continuation of those already published, on "the Sickness, Mortality, and Invaliding of the Troops at Home and in the Colonies," will be soon prepared, as it will doubtless contain much valuable information on these important and interesting topics.

The facts contained in the preceding paper point out, we think, the necessity for a careful attention to selection of the site for a cantonment. It has been shown that there are stations in India where the mortality among European soldiers is little higher than in their native country, and that even where this is not the case, different localities, within a short distance of each other, possess very different degrees of salubrity. It is true that occasionally military or political reasons exist, rendering necessary the occupation of an insalubrious spot; but where this is not the case, competent medical officers should be directed to investigate and report upon the sanitary condition of any place which is intended to be occupied as a military station.

The utility, also, of a system of periodical reports from all medical officers must be obvious, as affording information to the authorities on the state of the health of the army, and bringing under their notice any extraordinary amount of sickness and mortality that may occur in it. An opportunity would thus be afforded of directing an inquiry into the origin and progress of the disease by which it was produced, and if practicable of removing or mitigating its causes. The attention of the medical officers would also be more constantly directed to the sanitary state of the troops, and the measure would thus be attended with a progressive improvement in their professional acquirements. To effect these ends, however, not only are periodical reports necessary, but arrangements must be made to have these brought under the notice of the responsible authorities in a condensed form without unnecessary delay. Unless such an arrangement be adopted, the system of periodical reports must lose much of its practical value. They may serve at a future period to elucidate many points in medical science, but they will be inoperative in promoting the welfare of the soldier, at least until in many instances he has gone through a career of suffering which he might possibly have been spared. Humanity and economy alike demand this, for a little calculation will prove that the expense of preserving the soldier in health and efficiency is much less than that of replacing him, and that in this, as in most other cases, prevention is better than cure.

The documents from which this report has been prepared were printed by order of the Madras Government, but not published, the distribution of copies being confined to certain classes of officers in their own service. Our object has been to make the results of the investigation more generally known, in the hope of directing attention to the important subject of improving the health and maintaining the efficiency of soldiers; the first step towards which obviously is, to ascertain to what diseases they are most liable, and to what extent, in the different situations in which they are placed. It seems very desirable, that while the Indian Government bring the subject of the sanitary condition of the soldiers under the notice of their officers, by the gratuitous distribution of these reports, they should, by the publication of the documents, place the information within reach of the army and the public generally.

TABLE V.—Showing the Admissions and Deaths among the European Troops serving at the following Stations in the Madras Presidency, from 1829 to 1838 inclusive.

	Cannanore, Calicut, & Mangalore.			Madras.			Trichinopoly.			Bangalore.			Bellary.			Secunderabad, &c.			Kamptee.		
	Str.	Admit.	D.	Streng.	Admit.	D.	Str.	Admit.	D.	Streng.	Admit.	D.	Str.	Admit.	D.	Streng.	Admit.	D.	Str.	Admit.	D.
1829	998	1534	43	2002	2632	53	895	1789	31	1638	2448	57	923	1890	13	1223	2676	42	785	1764	30
1830	960	998	13	2433	3924	69	944	1276	26	1380	1845	32	919	1482	19	1210	2347	59	948	1916	21
1831	899	845	33	2006	3775	121	875	1246	29	1533	2199	45	876	1621	21	1181	2181	43	918	2348	43
1832	778	861	25	1556	2712	65	855	1234	67	1465	1875	28	853	1396	19	1090	1911	59	855	1971	33
1833	749	856	20	1470	3028	71	850	1431	41	1503	3560	92	867	1784	58	991	2471	62	999	2717	62
1834	823	1396	49	1020	2541	58	825	1496	24	1540	3460	42	762	1866	29	758	2531	77	1052	3414	42
1835	700	1413	17	894	1715	38	885	1850	39	1554	2676	31	930	1924	20	884	2307	59	969	2946	27
1836	720	1492	26	950	2084	25	921	1535	22	1736	2869	44	995	1770	37	1102	2338	62	1001	2280	35
1837	675	1510	41	886	1905	75	964	1614	44	1628	2232	32	1038	2043	42	1124	2157	138	1024	2015	50
1838	657	1282	33	754	1741	25	908	1673	28	1613	2261	34	857	2216	27	994	2014	63	1023	1721	34
Total.	7959	12187	300	13971	26057	600	8922	15144	351	15590	25425	437	9020	17992	285	10557	22933	664	9574	23092	377
Ratios.																					
1829	...	1537	43·1	...	1315	26·5	...	1999	34·6	...	1494	34·8	...	2048	14·1	...	2188	34·3	...	2247	38·2
1830	...	1039	13·5	...	1613	28·4	...	1352	27·5	...	1337	23·2	...	1613	20·7	...	1939	48·7	...	2021	22·1
1831	...	940	36·7	...	1882	60·3	...	1424	33·1	...	1434	29·3	...	1850	23·9	...	1847	36·4	...	2558	46·8
1832	...	1107	32·1	...	1743	41·8	...	1443	78·4	...	1280	19·1	...	1636	22·3	..	1753	54·1	...	2305	38·6
1833	...	1143	26·7	...	2060	48·3	...	1684	48·2	...	2369	61·2	...	2058	66·9	...	2493	62·6	...	2719	62·
1834	...	1696	59·5	...	2491	56·8	...	1813	29·1	...	2247	27·3	...	2449	38·	...	3339	101·6	...	3245	39·9
1835	...	2018	24·3	...	1918	42·5	...	2090	44·1	...	1722	19·9	...	2069	21·5	...	2610	66·7	...	3040	27·8
1836	...	2072	36·1	..	2194	26·3	...	1667	23·9	...	1653	25·3	...	1779	37·2	...	2122	56·3	...	2278	34·9
1837	...	2237	60·7	...	2150	84·6	...	1674	45·6	...	1371	19·6	...	1968	40·5	...	1919	122·8	...	1967	48·8
1838	...	1951	50·2	...	2309	33·2	...	1842	30·8	...	1402	21·1	...	2586	31·5	...	2026	63·4	...	1682	33·2
Mean,	...	1531	37·7	...	1865	42·9	...	1697	39·3	...	1631	28·	...	1995	31·6	...	2172	62·9	...	2412	39·4

TABLE VI.—Showing the Sickness and Mortality among the Native Troops serving at the following Stations in the Madras Presidency from 1829 to 1838 inclusive.

	SEA COAST.						TABLE LANDS.											
	Cannanore, Mangalore, and Calicut.			Madras.			Mysore Division.			Bellary and Cuddapah.			Secunderabad and Jaulnah.			Kamptee.		
	Streng.	Admit.	Died.	Streng.	Admit.	Died.	Streng.	Admit.	Died.	Streng.	Admit.	Died.	Streng.	Admit.	Died.	Streng.	Admit.	Died.
1829	5930	2552	47	7956	3454	62	7095	3214	81	4774	1596	53	9860	4266	75	5828	2715	47
1830	5601	3019	75	9546	3619	63	6586	2546	54	4998	1431	37	9036	3649	96	5364	2677	43
1831	5008	2367	37	7658	3370	64	6204	4209	140	3879	1354	55	8694	3387	87	4952	2833	73
1832	4569	2006	54	7025	3033	58	7459	4785	133	3222	1595	45	8656	3573	129	5066	2869	73
1833	2853	1442	34	7704	3652	112	7291	5137	145	3532	1745	136	8052	4437	165	4604	3117	82
1834	3098	2076	51	4863	2305	65	5980	6037	113	3009	2221	28	5425	6361	149	4636	4533	60
1835	2703	1756	43	3918	1642	34	8053	6032	90	3361	2552	22	7980	6731	113	4542	3843	70
1836	2502	1465	29	3755	1837	42	7617	5238	71	2739	1707	21	7885	4646	88	4631	2752	58
1837	3535	3027	36	3930	1628	79	7073	4936	79	3150	1352	39	7829	3571	121	4491	2596	61
1838	3944	2958	101	3787	1404	82	6658	4842	85	3335	2251	145	7625	5857	184	5199	2830	52
Total,	39743	22668	507	60142	25944	661	70016	46976	991	35999	17804	581	81042	46478	1207	49313	30765	619
Ratios.																		
1829	...	430	7·9	...	434	7·8	...	453	11·4	..	334	11·1	...	433	7·5	...	466	8·1
1830	...	539	13·4	...	379	6·6	...	387	8·2	..	286	7·4	...	404	10·6	...	499	8·
1831	...	473	7·4	...	440	8·3	...	678	22·6	...	349	14·2	...	389	10·	...	572	14·7
1832	...	439	11·8	...	432	8·2	...	641	17·8	...	495	14·	...	413	14·9	...	566	14·4
1833	...	505	11·9	...	474	14·5	...	705	19·9	...	494	38·5	...	551	20·5	...	677	17·8
1834	...	670	16·5	...	474	13·4	...	1010	18·9	...	738	9·3	...	1172	27·5	...	978	12·9
1835	...	650	15·9	...	419	8·7	..	749	11·2	...	759	6·5	...	843	14·2	...	846	15·4
1836	...	586	11·6	...	489	11·2	...	688	9·3	...	623	7·7	...	589	11·2	...	594	12·5
1837	...	856	10·2	...	414	20·1	...	697	11·1	..	429	12·4	...	456	15·4	...	578	13·6
1838	...	750	25·6	...	371	21·6	...	727	12·8	...	675	43·5	...	768	24·1	...	544	10·
Mean.	...	570	12·7	...	431	11·		671	14·1	...	495	16·1	...	573	14·9	...	624	12·5

From the PHILOSOPHICAL MAGAZINE for June 1854.

ON
A NEW AND SIMPLE METHOD
OF
DETERMINING THE AMOUNT OF UREA
IN THE
URINARY SECRETION.

BY

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UREA has long been regarded with much interest by scientific men, on account of its physiological and chemical relations. It represents one of the last stages of a series of metamorphoses or changes which nitrogenous matter undergoes in the animal œconomy, and is the form under which the detritus of pre-existing nitrogenous tissues which have become effete, principally pass from the system. This interesting organic base, urea, is not only formed during the exercise of the vital functions in man and some of the higher animals, but is also produced during the chemical decomposition of a number of substances containing nitrogen; and the chemist can now obtain it in any quantity by artificial means, and thus imitate one of the most important results of the chemistry of life.

In reference to medicine, urea is not without some practical interest, as it is well known that during various diseased conditions of the system the quantity of urea eliminated from the blood by the action of the kidneys and excreted in the urine is occasionally subject to great variation, and some ready means of ascertaining its quantity in that secretion might frequently aid the physician in forming his diagnosis of certain diseases.

Different means of effecting this object have from time to time been proposed; but all the methods hitherto recommended, with the exception, perhaps, of Baron Liebig's recent one, require for their execution much time and trouble, and in some cases complicated and expensive apparatus; and though capable in experienced hands of yielding tolerably accurate results, would in the case of those not much practised in chemical manipulation, and perhaps unaware of the many sources of error to be guarded against, give anything but correct results, and are therefore inapplicable to the greater number of those desirous of a quick and easy method of determining the quantity of urea in urine.

The method I propose is one of extreme simplicity, and can be performed by almost any one in a very few minutes, and is capable of yielding results sufficiently accurate for all practical purposes. It is founded on the fact I have recently observed, that urea is very readily decomposed by the chlorides, or rather hypochlorites of soda, potash or lime; and its constituent nitrogen is evolved in the gaseous state, and from the quantity of gas evolved I estimate the amount of urea present.

After trying different means of carrying out that fact with a view of making it available to determine the quantity of urea in urine, I found that the following very simple one seemed to answer the purpose completely. I take a strong glass tube, about 12 or 14 inches long, closed at one end, and its open extremity ground smooth, and having the bore not larger than the thumb can conveniently cover. This I fill more than a third full of mercury, and afterwards pour in carefully a measured quantity of urine to be examined, which may be from a quarter of a drachm to a drachm or upwards, according to the capacity of the tube; then holding the tube in one hand near its open extremity, and having the thumb in readiness to cover the aperture, I quickly fill it completely full with a solution of the hypochlorite of soda (taking care not to overflow the tube), and then instantly cover the opening tightly with the thumb, and having rapidly inverted the tube once or twice to mix the urine with the hypochlorite, I finally open the tube under a saturated solution of common salt in water, contained in a steady cup or small mortar. The mercury then flows out and the solution of salt takes its place, and the mixture of urine and hypochlorite being lighter than the solution of salt, will remain in the upper part of the tube, and will therefore be prevented from descending and mixing with the fluid in the cup. A rapid disengagement of minute globules of gas soon takes place in the mixture in the upper part of the tube, and the gas is there retained and collected. The tube is then left in the upright position till there is no further appearance of minute globules of gas being formed, the time being dependent on the strength of the hypochlorite and the quantity of urea present; but the decomposition is generally completed in from three to four hours; it may, however, be left

much longer, even for a day if convenient, and having set the experiment going, it requires no further attention; and when the decomposition is completed, it is only necessary to measure the quantity of gas produced by transferring it into a graduated tube or measure.

I have generally used a graduated tube in the first instance, as it saves the trouble of transferring the gas and incurring the risk of losing some of it in the process. That which I would recommend as being convenient for this purpose is a stout tube having a bore of half an inch in diameter, and capable of holding from 2 to 3 cubic inches. A tube having this bore and about 14 inches in length, will hold $2\frac{1}{2}$ cubic inches, which will be quite large enough. Each cubic inch of it should be divided into tenths and hundredths of a part of a cubic inch.

It is scarcely necessary to remark, that in cases where great accuracy is required, due attention must be paid to the temperature and atmospheric pressure, and certain corrections made if these should deviate from the usual standards of comparison at the time of reading off the volume of the gas; but in most cases sufficiently near approximations to accuracy may be obtained without reference to those particulars. From a number of experiments, I have ascertained that the quantity of gas evolved from different amounts of urea, treated in the way I have just described, very closely approximates to the quantity of nitrogen gas which should be furnished from the urea by calculation. This will be seen from the following, taken from many experiments.

The fifth part of a grain of urea should furnish by calculation 0·3098 parts of a cubic inch of nitrogen gas at 60° F. and 30′ bar.; the same quantity of urea treated as described furnished in one experiment 0·3001, and in another 0·3069 parts of a cubic inch of gas at the same temperature and pressure; which shows that the calculated quantity of nitrogen differs from the amount of nitrogen gas obtained by only a few thousandths of a part of a cubic inch. I may observe that I was obliged to operate on such small quantities of urea, on account of the graduated tube I had at the time being only of one cubic inch capacity.

Seeing, then, that the quantity of gas evolved agrees so very closely with the calculated amount of nitrogen present in a certain quantity of urea, I take the calculated amount as being the more correct; and knowing the relation that exists between a certain quantity of urea and nitrogen, I can from the quantity of gas evolved in any case easily calculate the amount of urea present by the simple process of rule of three. Thus the fifth part of a grain, or 0·2 of a grain of urea, gives by calculation 0·3098 parts of a cubic inch of nitrogen gas. Then 0·3098 : the volume of gas found : : 0·2 : to the required quantity of urea; or multiplying the first and third terms by 5, we have 1·549 cubic inch of gas representing one grain of urea, which is a simpler proportion. Using these data, I made several comparative experiments on different samples of urine with my method and that of Baron Liebig's, which I believe is considered one of the most accurate of the methods of determining urea in urine at present known. The following are the results of three comparative experiments on different samples of urine, using the same with each method.

Amount of urea in grains and parts of a grain in one fluid ounce of urine.

	Liebig's.	New method.
1st experiment . .	3·680	3·712
2nd experiment . .	5·328	5·472
3rd experiment . .	4·976	4·976

In the first and second experiments the quantity of common salt present in the urine was taken into account, as it is found to increase to a slight degree the apparent quantity of urea in the urine by Liebig's method. In the third this was not taken into consideration, and the quantity of urea was compared with the mean of two results obtained by my method. These experiments show how very closely the results obtained by the new method agree with those by Baron Liebig's, and therefore show the correctness of the former method.

I prefer the hypochlorite of soda to that of potash as a decomposing agent, because the soda salt is an article of our pharmacopœia under the name "Sodæ chlorinatæ liquor," and therefore can be so easily procured; whereas the potash salt, not being used in medicine, would require to be specially made for the purpose. As to the hypochlorite of lime, I do not think it so effectual, and it has the disadvantage of soiling the sides of the graduated tube by the carbonate of lime formed in the reaction.

In reference to the quantity of hypochlorite of soda to be employed, it should always be used in excess; and I think that about five or six times the volume of the urine employed would be found generally to be quite sufficient, and ensure there being an excess of the hypochlorite. The amount required may be easily determined also by direct experiment, by adding to a certain quantity of urine to be examined in a glass a measured quantity of the hypochlorite, and leaving it for a short time till the evolution of gas is nearly over; then if, on the addition of more of the hypochlorite, the effervescence is renewed, it shows that there was not enough of the decomposing liquor first employed, and more must be added from time to time till no further

evolution of gas is produced; and the quantity of hypochlorite used to arrive at this point indicates the amount necessary. I found by experiment that one grain of urea requires somewhere about half a fluid ounce of the ordinary sodæ chlorinatæ liquor for its complete decomposition. The amount of mercury employed requires some little attention. It should, as a general rule, be never less than the volume of gas produced; for if the volume of gas evolved is more than that of the mercury used, it will be more than that of the solution of salt, and therefore some of the mixture of urine and hypochlorite will be forced out of the tube before it is completely decomposed, and consequently some of the gas will be lost; so that if this occurs, we must repeat the experiment, using either a larger quantity of mercury if our tube will allow, or diminishing the quantity of urine employed.

It might be supposed on first sight that this method would be liable to the following source of error, viz. that some of the gas would be evolved and lost during the pouring in of the hypochlorite; but this is not the case, as several seconds elapse before there is any apparent reaction or evolution of gas on mixing the hypochlorite with the urine, and there is therefore full time to perform the experiment without any loss of the gas. I have also ascertained that the acid reaction of the urine does not affect my method. I should observe that this new method, like all the others known, is not perfectly free from some slight sources of error; the principal one being, that ammonia, if it exists in the urine, gives rise to nitrogen gas, and therefore increases the apparent amount of urea; but the same objection holds equally in Liebig's and Ragsky's methods, which are perhaps the two most accurate at present known. Uric acid also is similarly affected by the hypochlorite; but it and ammonia ordinarily occur in such small proportion in urine, that the error produced from these substances would be but trifling, and is partly corrected by taking the calculated quantity of nitrogen, which is, as I have shown, something more than that obtained from a certain quantity of urea by direct experiment.

In cases where ammonia or uric acid occurs in more than ordinary quantity, these substances must be separated by the usual means employed before having recourse to my method.

I should think that gently heating the urine with a certain quantity of baryta water as long as the odour of ammonia is disengaged, and then filtering the solution, as recommended by Liebig, for the separation of ammonia before applying his method (see the Quarterly Journal of the Chemical Society, vol. vi. p. 30), would effect the object very easily, and separate not only the ammonia, but also the greater part, if not all of the uric acid present.

There is one other source of error which may arise, and which can be easily avoided. It is the following: that if a solution of the hypochlorite of soda alone, or standing over mercury, be exposed to the light for several days, it will very gradually evolve a minute quantity of oxygen, which shows that in determining urea we should not allow the experiment to go on for too long a time; but if left for a day, or even two, it will scarcely make any appreciable effect on the quantity of gas evolved in testing for urea.

The reaction which appears to take place in the process seems to be the following. The hypochlorite of soda acting on the urea gives rise to the formation of carbonic acid, water, and chloride of sodium, together with the evolution of nitrogen gas. Thus

$$\underbrace{C^2.H^4.N^2.O^2.}_{\text{Urea.}} + \underbrace{3(Cl,O.NaO)}_{\text{3 Hypochlorite soda.}} = 2CO^2 + 4HO + 3Cl.Na. + N^2.$$

The nitrogen is evolved and the carbonic acid is absorbed by some of the hypochlorite of soda in excess, for I find that this salt absorbs carbonic acid very quickly without evolving any other gas; and I failed in several experiments to detect the smallest portion of carbonic acid in the gas produced by acting on urea, though I have always noticed the presence of a very minute quantity of oxygen in the nitrogen gas. These appear from my experiments to be the changes produced; but this part of the subject I have not as yet minutely examined, and my experiments have hitherto been made on healthy urine; I have, however, ascertained that several of the substances found in urine during disease, as for example, sugar, albumen, bile, and excess of urinary colouring matter, produce scarcely any effect on the results obtained by this new method of determining the quantity of urea in the urinary secretion.

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Medical Report

REMARKS

ON THE

PATHOLOGY AND TREATMENT OF BERI-BERI.

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[Reprinted from No. II. New Series of "Transactions of the Medical and Physical Society of Bombay."]

The term beri-beri has been for a long time applied by writers on tropical disease to a train of dropsical symptoms.

The unnecessary introduction of this word into our Indian nosology has, I am satisfied, served to retard and obscure our knowledge of the pathology and treatment of general dropsy, as it presents itself to our notice in the Natives of India.*

In the month of February 1851, I called the attention of a meeting of the Society to this subject, and explained the views respecting beri-beri which I had been in the habit of stating to the students of the Grant Medical College. This I did by submitting to the meeting an extract from my lecture on this disease.

In June 1853 several cases of beri-beri were admitted into the Jamsetjee Jejeebhoy Hospital, and were carefully observed by me.

They confirmed the opinions which I had previously expressed to the Society in regard to the pathology of the affection.

In my present communication I shall in the first place again quote the extract from my lecture on beri-beri, and then narrate

* There has been also confusion from confounding beri-beri with barbiers; the latter a term applied unnecessarily, by former writers on tropical disease, to a train of nervous symptoms. Both terms should, I think, be erased from the nomenclature of disease.

the circumstances connected with the cases of the disease lately observed by me in the hospital.

Extract from a Lecture on Beri-beri.

"The symptoms of this disease sometimes advance gradually; at other times they develope themselves suddenly. When they have been gradual in their approach, the individual for several days experiences a sense of weakness, and inability, or unwillingness to exert himself, and shortly afterwards to these symptoms are added pain, numbness, stiffness, with more or less œdema of the lower extremities. There is also more or less dyspnœa experienced, with a sense of oppression and weight at the epigastrium. The œdema does not continue confined to the extremities, but extends to the trunk and face, occasioning a general puffed and bloated appearance. The weakness of the limbs and the dyspnœa are particularly complained of on motion. As the disease advances, the dyspnœa increases, the face becomes more swollen and bloated, and the lips livid. The numbness of the limbs increases to such an extent that they become almost paralytic, the oppression at the epigastrium becomes aggravated, and frequent vomiting is excited, and the ejected matters are sometimes mixed with blood. The urine is scanty and high-coloured, sometimes almost suppressed; the thirst is great; the pulse is at first quick and small, or unaffected, then it becomes irregular, intermittent, and fluttering. Palpitations are experienced, attended with a sense of suffocation, a sinking pulse, and death.

"These trains of symptoms may run their course in from two to three weeks; or the course may be much more rapid, and when so, the numbness, the stiffness, and œdema of the lower extremities become quickly followed by the dyspnœa, the palpitation, and the sinking pulse.

"Now, what are all these but the symptoms which attend more or less on serous effusion into the connecting areolar tissue of the extremities, the cavity of the abdomen, that of the pleura, the pericardium, or into the air cells of the lungs, and their connecting areolar tissue—in fact, the symptoms of general dropsy more

or less extensive, more or less quickly forming. Dr. Watson, in his excellent lectures, thus writes of dropsy:—"Now from whatever cause this watery condition of the whole body may arise, the effects resulting from the presence of the *water* are the same: and of what do patients in this state usually complain? Why, of shortness of breath and palpitation of the heart; of a sense of impending suffocation if they attempt to lie down or actively to bestir themselves, of tightness and distress across the epigastrium, relieved somewhat by eructation, augmented by food and drink; of weight and stiffness of the limbs, and sometimes of drowsiness."

Now let us inquire what in fatal cases of beri-beri are the morbid appearances found after death. Why, dropsical effusions into the subcutaneous areolar tissue, œdema of the lungs, effusion into the sac of the pleura, into the pericardium, into the peritoneal cavity, and into the cranium. In some cases traces of old or recent inflammatory action of internal viscera may be found; but these form no essential part of the disease. It was the opinion of Dr. Malcolmson, entertained chiefly on account of the paralytic symptoms, that disease of the spinal cord or its membranes had much to do with this disease. This opinion, however, cannot, I think, be sustained. We must look upon this disease as a general dropsy; and in order to the right understanding of its pathology, let us call to mind the circumstances under which general dropsy generally presents itself.

1. There is one form to which the name active is given, arising when the surface of the skin, after free exhalation, has become suddenly exposed to cold: the excretion of fluid by the skin is stopped; the blood is driven inward; the kidneys for some reason or other do not take on their compenseting action—they become congested, and general dropsy with scanty urine is the result. This form of active dropsy involves, I believe, a certain degree of fulness of the vessels. Of general dropsies, more passive, we have several forms, depending on different deranged conditions—on congestion of blood, local or general; on disease of the heart or of the lungs, or perhaps merely on feeble action of the heart; also on disease of the kidneys favouring retention of urea, with consequent determination or

congestion. Dropsical effusion under both these circumstances, and more particularly when related to diseased kidney, will more surely take place if cold or wet be applied to the surface of the body, and the excretion of water by the skin be thereby impeded. Again, dropsy may arise, not from disease of the heart or lungs, or kidney favouring congestion, but from a deteriorated state of the blood—a blood, too, abounding in watery constituent; and here, too, the evolvement of the dropsy will be favoured by the influence of external cold upon the cutaneous secretion. Then, if diseased heart, or lungs, or kidneys, or blood too dilute, or vessels too full of blood, in their separate influences, lead to dropsical effusion, how much more surely will this result take place if two, three, or more of these conditions are associated together—if, for example, we have disease of the kidney associated with disease of the heart, and the sufferer from this complication be exposed to the influence of external cold; or if we have the vessels tolerably full of blood, but of blood abounding in watery constituent, and circulated by a feebly acting heart, and the sufferer from this complication be exposed to the influence of external cold?

Beri-beri I look upon to be a general dropsy of this complicated character, for the most part appearing when the vessels are tolerably full of blood, and a blood abounding in watery constituent, and following exposure to external cold. No doubt in many cases the occurrence of the dropsical effusions is favoured by existing heart, lung, or kidney disease.

But how does this state of the blood arise? It is, I believe, that condition of the blood which is present in the scorbutic diathesis, and which it is reasonable to believe may for some time precede the appearance of those phenomena which are characteristic of *scurvy*. And let us further recollect, that among the early derangements of the scorbutic state is the impaired irritability of muscular fibre, that of the heart included; and we have as predisposing conditions of dropsy, not only the watery blood, but vessels tolerably full of it, and this blood propelled by a feebly acting heart. Let us suppose an individual in this state to have the surface of the body exposed to an atmosphere

cold and damp, or to the chilling influence of piercing winds, and we have conditions surely sufficiently predisposing and exciting of general dropsy, the more certainly so if the skin have been previously actively perspiring, and the kidneys, from congestion or structural defect, do not readily take on a compensating action.

Do the circumstances in which beri-beri appears justify the view which I have now taken of its pathology? I believe they do. The disease has been chiefly observed in Ceylon, on the Malabar Coast, in the Circars, and in the lascars in ships on the adjacent seas. There has been a good deal written on this disease by the army surgeons in Ceylon, by medical officers of the Indian Army—by Dr. Malcolmson and others, and more lately by Dr. Carter; but, on the whole, there is a want of precision in these writings on the points on which we chiefly desire information. There is too much dwelling on symptoms, which are not difficult to understand, and too little of precise statement in regard to etiological circumstances, these being, it seems to me, the most important to determine. I would except, however, from these general remarks Dr. Carter's very excellent paper in No. VIII. of the Transactions of the Bombay Medical and Physical Society. In it there is much precise and valuable information. There is, however, still enough, I believe, in these accounts to justify the belief that beri-beri, more particularly in its acute form, will be found to present itself in individuals favourably circumstanced for the development of a scorbutic taint, and who while in this diathesis have been exposed to the sudden cooling of the surface of the body from sudden alternations of temperature or of wet; to cold dry winds or wet winds, or to exposure to damp from lying on the ground wet with rain or dew, while the body has been inadequately protected with clothing. It seems to me that the rational manner in which to consider each separate case of beri-beri is to view it as one of general dropsy, and to inquire into it exactly in the manner in which we do into other cases of general dropsy. We endeavour to ascertain the state of the heart, the lungs, the kidneys, the condition of the blood; we pass in careful review the circumstances in which the individual has been placed, with the view of ascertaining whether he has been exposed to causes which we believe to be predisposing and exciting of dropsy. It is only by keeping clearly in view the general pathological principles involved in such an inquiry that we can hope to reconcile the seeming contradictions of the confused details of which the narratives of this disease are for the most part composed. To me it seems, then, that beri-beri is a general dropsy, and that in regard to each instance of it, the question ought to be, what is the pathology of this case of general dropsy? Frequently, I believe, it will be found that the scorbutic diathesis and the influence of external cold are the only determining conditions.

In these remarks there have been discussed the symptoms, the pathology, the causes of beri-beri. The treatment will not detain us long—it resolves itself into prevention and cure. If it be the case that the scorbutic diathesis is the predisposing condition of the general dropsical state to which the name beri-beri is applied, then attention to those means which are preventive of scurvy must also be preventive of beri-beri. And if external cold be the ordinary exciting cause of beri-beri, then attention to clothing and avoidance of exposure must also be very important preventive means.

In regard to the treatment of the disease when fairly formed, it must be in accordance with those principles which guide the treatment of general dropsy. In the acute forms of this disease, in a full and robust body, with excited vascular action, there may be scope for general blood-letting, but it can be only under such conditions of the general system and of the circulation that this measure can be admissible, and these conditions will not, I apprehend, be found to be often present in beri-beri. Then we may, in other cases in which the vascular action is not depressed, in which there is no irritation of the gastro-intestinal mucous lining, endeavour to reduce the dropsical effusions by active purgation—by the use of elaterium for example, or other purgatives, combined, it may be, with mercurial purgatives. Then there are those other cases in which we cannot safely induce free watery excretions by the intestinal surface, but must endeavour to do so by the channel of the kidneys, by judicious and varied combinations of diuretics; and then there may be cases in which the action of the heart is depressed, and in these stimulants must be at the same time given. Nor must we forget that the skin may in some instances constitute an appropriate channel by which to lessen the watery constituent of the blood, and favour the absorption of the dropsical effusions. The vapour bath, or the hot air bath may be used with this view. Now you will find in the account of this disease that some recommend general blood-letting, others purgatives, others diuretics, and others stimulants; and the same may be said of other forms of dropsy. But if the pathology of dropsy be rightly understood, then it must be acknowledged that there is no special way of treating it. Those means which are the best in one case may be the very worst in another; and the same must be true of beri-beri.

Account of Cases of Beri-beri observed in the Jamsetjee Jejeebhoy Hospital in June 1853.

In the month of June 1853, 4 cases of beri-beri were received into the Jamsetjee Jejeebhoy Hospital. The sufferers were lascars belonging to a ship which had just arrived from sea. I learnt that many others of the crew had also suffered. One individual died on his way from the ship to the hospital. An inquest was held on the body. I suggested to the Coroner the expediency of eliciting information relative to the length of the voyage, and the management of the crew. To this Mr. Arthur obligingly assented. I shall first quote at length the deposition made by the Captain of ship; then state the important facts in the history of the cases admitted into the hospital; and finally inquire whether they confirm or not the view previously taken of the pathology of the disease :—

William Eames, on being duly sworn, says :—I am Master of the ship *Faize Allum*, of the port of Bombay, and have been constantly commanding, or been Chief Officer of vessels trading out of Bombay, with a lascar crew, since the year 1838. I last left Bombay on the 3rd day of June 1852, with a lascar crew of sixty-five men and boys; and the deceased, Bhana Moorar, aged about forty years, and deceased Jadow Dewa, aged about twenty-five years, both Hindoos, formed part of the crew. We proceeded from Bombay to Singapore, and from thence to Siam, and returned from thence to Singapore, and so back again to Siam; and from thence to Singapore, which place I quitted for Bombay on the 3rd March this year, expecting to make the voyage in seven weeks, the average passage being about two months. I had on board curry-stuff, rice, water, dall, ghee, salt, &c. as prescribed by the regulations, with a good supply of water; and during such time as the ship was in harbour always supplied the crew with greens, fresh fish, and fresh provisions. The crew all remained healthy till about the 21st day of May last, in latitude 10° N. longitude 64° W. We had then been two months and eighteen days at sea. On the 15th day of April I was within about 70 miles or thereabouts of the island of Ceylon, but being unable to stand the strong current and west winds then blowing, after consulting with my Serang and Chief Officer and passengers, I determined on relinquishing the attempt to get round Ceylon, and bore away for the line, to come up to Bombay by the Southern Passage, round the Laccadives and Changos, and ran to the south of the line as far as 8° 49′, and then to the westward as far as 63° W. and crossed the line again, running north, about the 6th or 7th May, and during most of the time had rain and squalls. Most of the water having been consumed, we filled up the water casks with rain water, collected on the surface of a clean awning. After making the line on the 6th of May, we had light weather, with occasional squalls and constant rain, and came on with the SW. monsoon up to 16° N. latitude on or about the 2nd June, and arrived in the harbour of Bombay on the 6th June. I consider that I first fell in with the SW. monsoon about three degrees north of the line. The crew were all healthy up to the 21st of May. When in latitude 10° N., longitude 64° W., symptoms of disease first showed themselves. The deceased Jadow Dewa complained of pains in his feet, and loss of strength down the legs, and pain in the chest, with difficulty of breathing, and constipated bowels. I gave him jalap and cream of tartar, and

to rub on the chest hartshorn, laudanum, and sweet oil. The crew since the 15th of April had been on a reduced allowance of about ten pounds in ninety pounds of rice, fish and water full allowance, the latter being rain water. Between the 21st day of May and 6th of June, eight other men were seized in the same manner, and all died; the average suffering about four or five days; a Portuguese sepoy died in three days. The deceased Jadow Dewa appeared to be recovering fast, and left the ship on the evening of the 6th of June. Bhana Moorar also appeared convalescent, and left the ship in my dingy. All the survivors of the crew are landed, the voyage being completed. The passengers, 12 in number, Natives, and myself and officer, and the majority of the crew, are well. We drank the rain water very freely, and I believe the deceased died of a disease called the *beri-beri* of Ceylon. I had a good medicine chest on board, and treated those taken ill according to the instructions laid down in Dr. Thomas' book of medicine. We had no liquor on board the ship. I offered the crew pickles and vinegar, and also sugar, but they refused to eat it. The passengers and myself used pickles, sugar, and vinegar freely, but the crew declined till latterly. The whole number who were attacked were about 35, of whom 10 have died. We were in the latitude of Cochin when the disease first appeared, and were about 10° to the westward of the coast of India, with light NW. and NE. winds. The crew were protected from wet as far as possible. The disease attacked persons of all ages, but principally the old and more infirm of the crew. Further I know not. The cargo consisted principally of sugar in bags, of Malling ivory, teakwood, plant and sapan wood, and raw silk. The hatches were kept constantly open when the weather would permit, the forecastle well cleansed and fumigated with powder burnt and benjamin."

The Jury returned the following verdict:—"Deceased died of beri-beri."

CASE 1.—Purshotum Zeena, a Hindoo kalasee, of the ship *Faize Allum*, twenty-five years of age, a man of stout frame, was admitted into the Jamsetjee Jejeebhoy Hospital on the 7th of June 1853. He had been ill sixteen days. The feet, legs, and thighs are œdematous, and, in consequence of the stiffness of the thighs and groins from the swelling, he walks with a waddling gait. The pulse is easily compressed. There is no abnormal dulness of the præcordial region, and the sounds of the heart are normal. The bowels are rather confined, and the urine is scanty. He complains of uneasiness at the epigastrium and the hypogastrium. There is no vomiting; the tongue is not coated, but is rather florid. There is no sponginess or discoloration of the gums. He continued in hospital till the 27th June, when he was discharged well. For some days after admission he complained of uneasiness and sense of weight at the epigastrium, and there was abnormal dulness on percussion, to within two inches of the umbilicus. The urine showed no traces of albumen. He was treated with occasional doses of compound powder of jalap, the anti-scorbutic mixture of the hospital, a diet with fresh vegetables, and lemonade, and a small allowance of arrack. Under this treatment the dropsical symptoms and the fulness at the epigastrium disappeared, and he left the hospital quite well.

Case 2.—Bhowan Rama, a Hindoo kalasee, of the ship *Faize Allum*, thirty-five years of age, and of stout frame; ill for fifteen days. The legs, thighs, and feet are very anasarcous, and his gait is waddling from the stiffness of the legs and groins. The pulse is very feeble, and the urine scanty. He has uneasiness at the epigastrium, but no dyspnœa, except after walking. The sounds of the heart are normal, and there is no dulness of the præcordial or other regions of the chest, and the respiratory murmur is distinct; the tongue moist and without fur; the gums discolored, but not swollen; the teeth feel tender on eating; urine not albuminous. The treatment followed was the same as in the first case, with the addition of the occasional use of the warm bath. He was discharged well on the 27th of June.

Case 3.—Visram Narrayen, a Hindoo kalasee, of the ship *Faize Allum*, twenty years of age, ill fourteen days, was admitted into the Jamsetjee Jejeebhoy Hospital on the 7th June 1853. There was general anasarca. The pulse was feeble. There was no abnormal præcordial dulness; the sounds of the

heart were normal; there was slight fulness of the abdomen; no swelling of the gums. On the 8th and 9th, the pulse became feebler, and the breathing oppressed; the urine very was scanty, but showed no traces of albumen. He died on the afternoon of the 9th. He was treated with stimulants—ammonia and arrack. The body was examined two hours after death, and Mr. Lisboa has favoured me with the account of the appearances.

Head.—On opening the cranium, about 5 ounces of serous fluid oozed out. The structure of the brain, cerebellum, pons varolii, and medulla oblongata was healthy. The ventricles of the cerebrum contained the normal quantity of fluid.

Chest.—The cavity of the chest contained only 2 ounces of thin transparent fluid. Both lungs collapsed freely, and their structure was healthy; they showed no appearance of being œdematous. The heart appeared slightly enlarged. On opening both the right and left cavities, they were found to contain a thin red fluid and a few soft red coagula of blood; the fluid in the right ventricle was frothy.

Abdomen.—The abdominal cavity did not contain more than 2 ounces of thin transparent serous fluid. The peritoneal surface of the intestines was of reddish colour from congestion; all the abdominal viscera were more or less congested, but their structure was healthy. The liver presented appearances of congestion more than any other organ; from its incised surface fluid blood flowed freely.

Case 4.—Jadow Dewa, a Hindoo Kalasee, of the ship *Faize Allum*, 25 years of age, ill sixteen days, was admitted into the Jamsetjee Jejeebhoy Hospital on the 7th June 1853. There is general anasarca, the abdomen is rather full, and is distinctly fluctuating; the breathing is oppressed; there is no abnormal præcordial dulness; the sounds and action of the heart are irregular. He complains of pain at the epigastrium; the pulse very small, and the skin coldish; the gums are discoloured, but not swollen. He died on the morning of the 8th.

The body was examined five hours after death; and I am indebted to Mr. Lisboa for the account of the appearances.

Head.—On removing the calvarium, about 5 ounces of thin serous fluid oozed out. The structure of the brain, and of the other contents of the cranium, was healthy. The ventricles of the cerebrum contained a little more than the normal quantity of thin transparent serum, with a few bubbles of air.

Chest.—Both cavities contained about 12 ounces of serous fluid. The right costal pleura adhered to the visceral, by means of old bands of areolar tissue, which was also infiltrated with serous fluid, except at the lower part of the chest, where there was a sort of sac, holding about 4 ounces of serum. The left lung collapsed freely. The structure of both was healthy, except that it appeared to be slightly compressed. On pressing the incised surfaces, a small quantity of frothy serous fluid oozed out. The heart was apparently enlarged (dilated); both auricles and both ventricles were distended with fluid blood, and some few soft red coagula. The fluid in the right ventricle contained a few bubbles of air. The structure of the heart was healthy. All the abdominal viscera were more or less congested, but otherwise they were healthy. The peritoneal lining of the abdominal cavity, and that covering the intestines, presented a reddish appearance.

The blood, examined under the microscope, showed a normal state of the corpuscles.

Remarks.

The circumstances under which beri-beri made its appearance in the ship *Faize Allum* are certainly confirmatory of the view which I have taken of the pathology of the disease. The ship had been two months and eighteen days at sea. The crew were for the last month on somewhat diminished rations, and at no time did anti-scorbutics form part of the dietary. The weather was bad, and there was exposure to fatigue. The disease appeared on the 20th May. The weather during the fifteen days preceding had been wet and squally. Of a crew of 65, 35 were attacked, and 10 died.

The officers and passengers of the ship did not suffer from the disease. They used anti-scorbutics freely, and we may assume, at least as regards the passengers, that they were not exposed to

the inclemencies of the weather; and as regards the officers, that they were by clothing better protected than the lascars.

It is true that in the 4 cases which came under my observation in the hospital, the undoubted external phenomena of scurvy were not present. In 2 the gums were discoloured, but they were not swollen and spongy. But the view taken of the pathology of the disease does not require the presence of scorbutic phenomena. There can be no doubt that the diathesis is of gradual formation, requiring, in all probability, the influence, for a considerable period, of the conditions which induce it, before the characteristic phenomena of the disease appear. Nor can it be questioned that the changes which the blood is gradually undergoing in the formation of this diathesis must be very favourable to deranged action of various kinds, under exposure to cold as an exciting cause; and must be favourable, when the surface of the body becomes chilled, to the occurrence of internal congestion, with dropsies and occasional hœmorrhages. It is, indeed, only when the diathesis is partially formed, that we are at all likely to meet with beri-beri, for a really scorbutic crew is not likely to be fit for duty, and exposed to wet and squally weather.

Though the evident phenomena of scurvy were absent in these cases, still there were facts observed which justify the belief that the diathesis was present in some degree. In both the fatal cases the blood was found more or less fluid after death. In all the cases the feeble action of the heart was very remarkable: in 3—the two successful cases and 1 fatal—this could not be attributed to thoracic dropsical effusions, for in none of these 3 cases was there effusion into the sacs of the pleura or the pericardium; nor was there œdema of the lungs. Again, in the 2 fatal cases, all the cavities of the heart were dilated and filled with blood, showing that the circulation ceased from failure of irritability of the muscular fibre—that death was by syncope.

This defective irritability of the heart points to something in the pathology of the disease, in addition to the dropsical effusions, and, perhaps, there is no state of the system more generally characterized by impaired irritability of the muscular fibre than the scorbutic diathesis. There is no fact more familiar than the occasional occurrence of sudden death in scorbutic patients by syncope.

There are other facts of interest to note in these cases. A sense of weight and uneasiness at the epigastrium is a common symptom of beri-beri. In one of the successful cases the enlargement of the liver was very evident from percussion. In both the fatal cases the congested state of the liver was marked. This symptom, then, I believe, is due to congestion of the liver. The presence of this congestion, and the altered state of the blood, also explain well the occasional occurrence of hœmatemesis in beri-beri. In these cases there was complete freedom from heart or kidney disease.

Then, as respects prevention and treatment, the principles are sufficiently clear. By suitable dietaries, to prevent the formation of the scorbutic diathesis; by suitable clothing, as far as practicable, to protect the crew from inclemencies of weather. In regard to treatment: 1*st*, the use of anti-scorbutic regimen and remedies; 2*nd*, to regard the feeble pulse as a state of action independent of the dropsical effusions, and to give stimulants more or less freely; 3*rd*, to remove the dropsical effusions by purgatives or diuretics, being guided to the use of the one or the other by the state of the pulse; 4*th*, to increase the cutaneous capillary circulation, by friction and warm clothing. The use of the hot air bath or warm bath must require caution, in consequence of the increased depression of the heart's action which follows its transient excitement from these means. They had better, I think, not be included as part of the regular treatment of the disease.

It is altogether unnecessary to take up the time of the Society with details of treatment. It is sufficient to state the principles which it seems to me ought to be kept in view. I attach great importance to the fact, which from these cases is, I think, clearly made out, that the feeble pulse is not consequent on the functions of the heart or lungs being interfered with by the dropsical effusions, but is dependent on the impaired irritability of the muscular fibre of the heart—one of the phenomena of the scorbutic diathesis. It would therefore, I think, be an error in

practice, if we expected the force of the heart to improve under the mere removal of the dropsical effusions by purgatives or diuretics. The use of stimulants must go hand in hand with that of these evacuants, indeed must in many cases, in advanced stages, be the only means we can safely avail ourselves of; and while we keep up the action of the heart, and remove the effusions, it is, if these pathological views be correct, also a very evident indication to improve the diathesis by anti-scorbutic means.

THE HISTORICAL RELATIONS OF ANCIENT HINDU WITH GREEK MEDICINE

IN CONNECTION WITH THE STUDY

OF

MODERN MEDICAL SCIENCE IN INDIA:

BEING

A GENERAL INTRODUCTORY LECTURE

DELIVERED JUNE 1850;

AT THE

CALCUTTA MEDICAL COLLEGE.

BY

ALLAN WEBB, M. D.,

Author of the Pathologia Indica:

SURGEON BENGAL ARMY,

PROFESSOR OF DESCRIPTIVE AND SURGICAL ANATOMY,

LATELY

OFFG. PROFESSOR OF MEDICINE AND CLINICAL MEDICINE.

Calcutta:

J. C. SHERRIFF, MILITARY ORPHAN PRESS.

1850.

PREFATORY NOTICE.

At the request of the Council of Education of India, this Lecture has now the honor of publication. In delivering it, the Author stood in a proverbially perilous position *between two chairs;* not feeling quite sure as to whether he had the honor to represent the chair of Anatomy or that of Medicine. He is conscious that some want of unity in his discourse has arisen from this circumstance, and hopes that it may be indulgently regarded.

The quotations from Sanscrit Authors have been collated with the originals, and whenever the authority was omitted in Dr. Wise's book, it has been supplied through the kindness of Pundit Moodusudun Guptoo.

A. W.

No. 2, *Russel Street:*
July 9*th*, 1850.

INTRODUCTORY LECTURE.

GENTLEMEN,

THE discourse, which I have this day the honor to address to you, opens the 16th Session of our Calcutta Medical College. Its past history has been placed before you already in the Introductory Lecture of my colleague, Dr. H. GOODEVE,* but I will very briefly revert to some parts of it here. Our College was instituted in 1835. Two Assistant Surgeons of the Bengal Army, Messrs. BRAMLEY and GOODEVE, were appointed to instruct the students in "the various branches of Medical Science."† To them, in conjunction with the worthy Pundit MADHUSUDEN GUPTOO, belong the honor of introducing into India, the study of anatomy by practical dissections. I was present in 1838, with some whom I have the pleasure to meet here this day, upon the interesting occasion of giving the four first passed students their medical diplomas. The success of our College was felt at that time, by all well-wishers to India, by all who desired to raise her people in civilization, and to extend to them the blessings of European science, to be a great experiment. We can now hardly conceive of the diffidence, bordering upon distrust, with which it was at first

Historical retrospect.

* June 1848.

† *See* Order in Council 28th January 1835, Resolution 4.

regarded.* In the address of Dr. JOHN GRANT, upon the occasion alluded to, we observe the earnest, almost parental solicitude, with which he, and his colleagues of the Council of Education, watched over the success of this infant Institution; a success so mainly dependent upon the well-doing of its students.

"My young friends (he said) I now bid you farewell. Go on in the strength of a good cause, and earn for yourselves an honorable name, in an untried path. As I have said you are the first fruits of a great experiment; that of enfranchising the native mind from ignorance and dark prejudices. Recollect that the success, to a certain extent, of this most interesting experiment, depends upon your future career. A false step on your part might be productive of disastrous consequences to the great cause of Native education; to say nothing of the mortification which any misconduct, or failure of yours, would inflict upon your teachers, and upon us, your godfathers as I may say in the profession."†

But the students of that day, as well as those who followed them, nobly responded to this earnest appeal. This College is now regarded no longer as an experiment; but as an admirable, beneficent and established triumph. It is thus honorably spoken of by the Bishop and Clergy, in the address, upon the late occasion of the Queen's Birthday.

"Her Majesty will, we are persuaded, be also pleased to learn, that the Indian Government has succeeded in a truly wonderful manner in diffusing through the land the soundest principles of medical science; that Graduates are being educated at the Medical College in a manner not inferior to some of the most celebrated schools of medicine in Europe; and that their skill and talents are successfully exerted for the mitigation of

* *See* Report of Council of Medical College, 1839, *Preface.* † *Ibid*, p. 25.

human suffering, in the various Dispensaries of the Provinces; whilst the magnificent Fever Hospital, which is now being erected in Calcutta, will not only prove an ornament and blessing to the Metropolis of India, but become eminently useful to the school of Medicine itself."*

Subjects proposed.

But the degree of enfranchisement of the Native mind, and the measure of our success, can scarcely be appreciated without reference to Indian Medical Science as we found it in this country. I propose therefore an examination into the state of medicine here in India, previously to the introduction of European science; and I hope that a comparison of it, with medical science among the Greeks, may be found both interesting and instructive, *as a general introduction to the History of Medicine*; especially as respects—I. *Anatomy*, II. *Physiology*, III. *Pathology, and Practical Medicine*; for Dr. ROYLE has shown the extreme probability that Chemical Science, as well as Materia Medica, was well advanced in the ancient times of India: that Greeks and Arabs† alike profited by it.

But before proceeding further upon this subject, I will say a few words upon your own position and duties. There are, perhaps, no medical students at this moment in the world, to whom such great privileges are so fully and so freely given, of mere sovereign bounty, as those which you receive at the hand of Go-

* Christian Intelligencer, Calcutta, June 1850.

† "Not unwilling to pluck a few more plumes from those who heated their baths with the Library of Alexandria," he thinks it probable that GEBER, the earliest Arab Chemist, was instructed in Rasayana (Chemistry) from the *Ayur Veda*. In the "earliest of Arab authors SERAPION, the first of Hindoo Physicians, CHARAK, is mentioned by name;" in Latin translated "XARCH *Indus*" "XARCHA *Indus*." *Avicenna*, again says "apud, SCIRAK *Indum*" "RHAZES inquit SCARAC *Indianus*" again "*dixit* SARAC." Essay on the Antiquity of Hindoo Medicine, J. F. Royle, M. D., London, 1837, pp. 37, 39. *Ibid*, p. 177. *See also* Hindu Medicine, T. A. Wise, M. D., Calcutta, 1845, p. 118.

vernment. This medical school, however regarded, as respects its Instructive Establishment, its Hospitals, its Museums, or the number of patients and students who benefit by it, is now equal to some of the most ancient schools of Europe; yet so far as I know it stands alone in this, that every advantage is freely given. Here no fees are paid! The finest Medical education is freely offered gratis, to all comers; of whatever creed, of whatever caste, of whatever clime. No wonder where all is thus freely given, that we find this goodly gathering of students, of all kindreds, and countries around us. From the Punjab to the Burman Empire, from Ceylon to the snowy mountains of the north, our young men assemble here; without any other jealousy than that of professional honor, any other distinction than that of science. All are equally welcome, equally rewarded, equally respected, if they do well.

Appeal to Students.

It has been said—"knowledge is power," but knowledge and well-doing are not always synonymous. We sometimes see young men, not behind their fellows in the race of intelligence, lost, confounded, and ruined; having forgotten that man is not only an intelligent, but also a moral being. *Do to others as you would be done by,* is a grand rule for the medical student. Follow it out, and you *dare* not be idle here. To be so would stain your humanity, dishonour your profession, disgrace your College.

As Professor of Clinical Medicine my guidance of your studies has been but short; but it has afforded me additional reason to urge upon you this principle of *responsible humanity.* Watch over your patients with this principle true in your hearts, and your minds will seize, with powerful and tenacious grasp, the Clinical instruction of the Professor. It will become a sacred duty to record your cases accurately, to think of them earnestly. You will be the first students in the wards, and the last to leave; your books will be read well, and well remembered, and understood.

It was said upon the occasion alluded to, of our first Graduates leaving the College,—"Your duties are four-fold; they concern the sick, the profession to which you belong, society at large, and the Government we all have the honor to serve. Of your duties to yourselves, I say nothing, deeming that they are self-evident to you. All these duties are based upon this very simple golden rule, to do to others as we would be done by. An inhuman, a dishonest, a licentious medical practitioner, is there not in the very expression something that jars upon the moral sense? If a physician be wanting in honor, in humanity, and in rectitude of conduct; what possible security have society for the confidence reposed in him? None! and where are those on the face of the earth, men in whose discretion, honor, and goodness, such a large measure of confidence is placed, as in medical men? If they want those qualities, then I emphatically say they want all: for the other qualities are naught without the moral ones. Scientific skill and experience, are like the sword of the loyal and brave; of use only when in the hands of the honest and true. Personal honor must be the loadstar of your conduct: without that, you will only be bringing a reproach upon the fair fame of our profession."*

You now see before you examples of what courage and conduct will do. DWARKANATH BOSE was the first of our gallant band of medical pioneers, to return to us with the diploma of the Royal College of Surgeons. He is now one of your teachers of Anatomy. SURJOO COOMAR CHUCKERBUTTY, just returned with the diploma of the London University, is Assistant Physician in our College Hospital. DRS. SEAL and BOSE both held

* Report of Council of Medical College, Calcutta, 4th February 1839, p. 26.

appointments in this City. It is not often that men pass at once from the schools to offices of such importance. In conferring these rewards upon such young men, the Government has strongly marked its interest in their welfare, and its desire to encourage you.

I now revert to the main subjects of this lecture.

Among the studies which have the strongest claim upon your attention, Anatomy stands first. It is the keystone of Medical science; take it away, and there is no stability. This truth is evident from the history of Medicine in all ages, the history of every school, nay of every individual medical man. For the acquisition of this science, no students possess more ample means and resources than yourselves; subjects abundantly supplied, airy and commodious rooms, and even books and instruments. The use of arsenic, as a disinfecting agent, preserves the subjects from putrefaction, the dissectors from danger. Since I have been attached to the College (now about nine years) there never was an instance of death from dissection wounds. In London hardly a season passed without horrible disease, or death, from this cause alone. Your Library and Museum are well supplied with books, as also with anatomical works and preparations. Microscopical Anatomy is now most fully elucidated, both in diagrams of great beauty and fidelity, as well as by the daily use of the microscope, at the lectures of the Professor of Physiology and General Anatomy. Remember that the grammar and the groundwork of anatomy is a knowledge of the bones; and when inclined to make difficulties, look at your fellow students of the Hindoostani class, who without a knowledge of the English language, without the same access to books and plates which you possess, do yet attain to a knowledge of this subject. Prejudices against the study of Anatomy are not confined to India. I have known the time in England even,

I. Ancient and Modern Anatomical methods.

when dissections could only be carried on at night. But "where there is a will there is a way," which every earnest student soon makes out, and the way is much easier in Bengal now, than in the ancient times of SUSHRUTA, (the GALEN of India,) a Rishi of highest rank. The way is pleasanter too, as you will learn from the following, *his* direction for the ancient Hindoo process —" When a proper body for the purpose has been selected, the dejections are to be removed, the body washed, and placed in framework of wood, properly secured, by means of grass, hemp, or the like. The body is then to be placed in still water, in a situation in which it will not be destroyed by birds, fishes, or animals. It is to remain seven days in the water, when it will have become putrid. It is then to be removed to a convenient situation, and with a brush, made of reeds, hair, or bamboo-bark, the body is to be rubbed, so as by degrees to exhibit the skin, flesh, &c.; which are each in their turn to be observed before being removed. In this manner the different corporeal parts of the body, already enumerated, will be exhibited; but the life of the body is too etherial to be distinguished by this process."* Imagine, gentlemen, the removal of such a body, after seven days' putrefaction, to a convenient situation *in Calcutta!*

The Anatomical system of the ancient Hindoos (greatly resembling that of PLATO,) was precisely as superficial as might have been expected from this very original mode of acquiring anatomical science. It may be judged of by a single sentence; —viz., " the navel is the origin of all the vessels, and is the principal seat of life."† This is the Chinese notion; and it was prevalent among the Jews also; with them " health to the navel," is health to the life!

* Commentary on the Hindu System of Medicine, by T. A. Wise, M. D., Calcutta, 1845, p. 68.

† *Ibid.*

The venerated father of Medicine, the great HIPPOCRATES, who lived nearly a thousand years before SUSHRUTA wrote, had a much more just conception of anatomical science than he; and yet neither in his time, nor for two centuries later, is there any distinct record of human dissections being practised by the Greeks. It was not until after the death of ALEXANDER the Great, and the institution of the Museum at Alexandria, (304 years B. C.,) that the great anatomists ERASISTRATUS, and HEROPHILUS recorded their discoveries. In the time of GALEN little even of their works remained extant. Yet had the Greeks noble witnesses of their anatomical skill. Their sculpture even to this very day is unrivalled for its truth and anatomical correctness. The agonizing group of the LAACOON is still the admiration of our time, as it has been of preceding ages.

Could POLYODORUS, ATHENODORUS and AGESANDER of Rhodes have executed such works as this without a practical knowledge of anatomy? I believe it impossible. All the great artists of our times are practical anatomists. They know that expression is effected only by muscular action; and when a LANDSEER dissects the animals, whose expressions and passions he so wonderfully paints, we may conclude that PHIDIAS even could not work without it. Yet the most perfect specimens of Hindoo sculpture, the relievos in their most ancient cavern temples, show nothing that for truth of form, can compare with Greek specimens of art. Neither at Ellora nor at Karli, not at Elephanta, nor even among the fresco paintings of Adjuntah, have I seen any thing that would lead me to suppose they had ever attained to a knowledge of the muscles, or of their power in expression. From their writings therefore, and from their specimens of art, it may be concluded, that the Hindoos never attained to a better knowledge of anatomy, than this poking, in a puddle, at a putrid carcase, might be supposed to confer.

II. Physiology.

But if other arts and sciences are allied to Anatomy, Physiology, or the knowledge of the healthy actions of our bodily organs, is, as you well know, immediately based upon it. Ignorance of the one argues the other unknown likewise, to the Hindoos. No fact can be more plainly deduced from history than this, that Medicine, in every age, has been guided by the prevailing doctrines in Physiology. And so pernicious have been these physiological doctrines among the ancients, when unsupported by Anatomy, so wild, inconsistent, and absurd, leading in practice to such strange vagaries, that about the time of GALEN they had well-nigh led to the absolute extinction of medical science. We may advantageously refer to some of them.

In the days of HIPPOCRATES the elementary theory was the only one known in Greece.* He as well as PLATO taught that fire, air, earth, and water, were the elemental constituents of our bodies.† His views, and those which PYTHAGORAS entertained of health and disease, precisely accord with PLATO's and the Hindoo SUSHRUTA's. When we remember also that PYTHAGORAS introduced Brahminical institutions into Greece; that he as well as PLATO believed in the transmigration of souls; that Hindoos never travelled, but Greeks did; we can have very little doubt, that India was the source, whence the Greeks derived their systems of philosophy and of medicine.‡ The analogy between the Hindoo and Greek systems of medicine is certainly much too close to be the result of accident.

Of the Greek philosophers, THALES considered water as the principal element in the composition of our bodies; ANAXI-

* HIPPOCRATIS Opera, Edit. 12° Lugduni. 1564 " lib. *de carnibus*," fol. 44.

† PLATONIS Op. Om. a Bekker, Timæus, c. 11. *ἐκ γάρ πυρὸς παντὸς ὕδατός τε κὰι ἀέρος καὶ γῆς ξυνίστησεν ἀυτον ὁ ξυνιστάς.*

‡ PYTHAGORAS (B.C. 600) is stated to have been in India—History of Medicine, W. HAMILTON, M. D., vol. I. page 43, Edit. London, 1831.

MINES thought air was chiefly concerned; PYTHAGORAS gave fire as the main element; XENOPHANES formed us of earth. EMPEDOCLES, the celebrated philosopher of Agrigentum, (B.C. 578,) is said to have first united all these various opinions, and given to each element its *proper* share in the composition of our bodies. Thus he explains the formation of the muscles by an unequal admixture of the four elements. The ligaments had a superabundance of fire and of earth. Bone had a greater quantity of earth and of water, and so forth.* It appears therefore, gentlemen, that having found the "stuff" these wise men hardly knew what to do with it, in order to make a man. But the Greek writers become more intelligible to us moderns, especially PLATO, through the severer abstractions of the Hindoos. The Hindoos, for instance, boldly and fairly embody qualities. These qualities form elements of the elements, these subtle existences form atoms, or the grosser bodies—fire, air, earth, and water; to which the Hindoo superadded *ether*, (*akasa*.)†

The Hindoo sage SUSHRUTA says "when digestion is accomplished, the respective elements unite with those which had entered into the formation of the body; the earth unites with earth, water with water, &c., and they acting on the inherent qualities of each of the five elements, mix and increase those in the body; smell, the property of earth, with that of the body, taste with water, touch with air, and sound with ether."‡ This is exactly what EMPEDOCLES taught, viz., that sensations take place only through the affinity of elements composing the object perceived, with the elements of the perceptive organs or senses. He says, "by the earthy element, we perceive earth; by the watery, water; the air of heaven, by the aerial

* Hist. Med. KURT SPRENGEL, Tom. I. Sect. iii. p. 256 and p. 263.

† Hindu Medicine, T. A. WISE, M. D., 1845, p. 31.

‡ *Ibid*, p. 42. See Prof. H. H. WILSON's Commentary upon the Sankhya Karika Philosophy, Oxford, 1837. Edit. 4to, p. 121.

element; and devouring fire, by the element of fire."* This passage has been commented upon both by ARISTOTLE† and by GALEN‡ as being somewhat obscure; but it is clearly interpreted by Hindoo philosophy;§ and beautifully paraphrased by MILTON.‖

Both HIPPOCRATES and PLATO declare (B. C. 470,) the *humors* of the body to consist of four, blood, phlegm, black and yellow bile. CHARAKA and SUSHRUTA say air, bile, phlegm, blood, are the chief humors of the body. They are called by them "pillars of the system." "If they be deranged they are the cause of disease." "Without these the individual could not exist." They assert that "as long as the elements remain in due proportion, the body remains in health;" "when any one is increased or diminished disease occurs."¶ This causation of disease agrees precisely with HIPPOCRATES** and with PLATO. PLATO says "the disproportion of the physical elements of the body is the proximate cause of all diseases;—since the marrow, the bones, the muscles and the ligaments consist of these elements, as also the blood and the humors derived from them. Disproportion of the elements produces

* *Γαίῃ μὲν γὰρ γαῖαν ὀπώπαμεν, ὕδατι δ' ὕδωρ*
Αἰθέρι δ' αἰθέρα δῖαν, ἀτὰρ πυρὶ πῦρ ἀΐδηλον:

Histoire Pragmatique de la Medicine KURT SPRENGEL, Paris. Tr. GEIGER. 1810, Tom. I. Sect. iii. p. 256 and p. 263.

† ARISTOTELIS Op. Edit. fol. Geneva, 1605. Tom. 1, p. 479.

‡ GALENI *Op. Om.* Frob. Edit. fol. 1561 *de Hippoc. et Platon. decretis lib.* VII. p. 543.

§ Pathologia Indica, ALLAN WEBB, 1848 Calcutta, 2nd Ed., Pt. II., p. 267.

‖ Paradise Lost, Book V. *v.* 407.

¶ Hindu Medicine, T. A. WISE, 1845, p. 43 and p. 194.

** HIPPOCRATIS COI Op. Edit 12mo. Lugduni 1564, "*lib. de nat. hominis*" fol. 25, "At vero corpus hominis habet in scipso sanguinem et pituita et bilem duplicem, flavam vidilicet et nigram. Atque hæc sunt ipsi corporis natura, *et per hæc et ægrotat, et sanus est.*"

degeneration of the humors, and that degeneration again causes the different diseases."*

Thus far in Physiology the Hindoos and Greeks are one.

III. Pathology.

Now, gentlemen, we must examine, how this elemental theory, the sole philosophical basis of Greek and Hindoo medicine, is made to account for diseases. HIPPOCRATES taught that "the combination of the four elements into the four states or *qualities* with which they were affected, of hot, cold, moist and dry, gave rise to the four fluids or humors of the body; blood, phlegm, bile, and black bile, which originally tended to produce the four *temperaments*, and which, in their turn, contributed to the excess or defect of each of the humours." Hence arose the pathological doctrines, which, under the denomination of the Humoral Pathology, became the prevailing opinion of all sects and of all theorists, until the commencement of the eighteenth century. (Cycl. of Pract. Med. 1. p. xi.)† Again PLATO was a great genius, for his thoughts on some matters have been powerfully impressive. But any one of you could confute his pathology, and smile at his absurd conceit in meddling with medicine. He *conjectured* (and his followers vainly thought conjecture would suffice), that the deliquescence of bone and of flesh, produces black and yellow bile, which passing into the vessels, and mixing with the blood become fruitful sources of disease; degeneration of the marrow induces the most malignant and even mortal maladies (a still common fallacy.) After this he comes to the true Hindoo Doctrine, and deals out diseases of *air*, of *phlegm*, and of *bile*, with as much

* *τὸ δὲ τῶν νόσων ὅθεν ξυνίσταται, κ. τ. λ.* Timæus c. 63, and away he goes into the thick of it. Again c. 66. *τὸ μὲν ὑπὸ πνεύματος, τὸ δὲ φλέγματος, τὸ δὲ χολῆς. κ. τ. λ.*

† Essay on the Antiquity of Hindoo Medicine, J. G. ROYLE, M. D., p. 110.

gravity as CHARAKA himself, who says, these humors being ill, are of all our ills the root. And a numerous catalogue he gives,—" 80 diseases of air *(baya)*, 40 of bile *(pitta)*, 20 of phlegm, *(kapha)*,"* besides their compounds.

But to return to the Divine PLATO, pray attend to his pathological details, and then compare them with the Hindoo doctrine which follows. He says, "when *air* is deranged about the chest, difficult breathing and wasting consumptions follow; when *air* is deranged in the joints, or about the back, it causes tetanic spasms, violent pains, and convulsions so difficult of cure; and also fevers. When *phlegm* and *air* are deranged together, papular eruptions result; if combined with *black bile*, serious head-affections, and epilepsy. *Phlegm* is the origin of all the various kinds of defluxions, besides other ailments. From inflammation of the *bile*, exalting its natural heat, we have breaking *outwards*, abscesses, and tumours; or *inwardly*, it may cause painful burnings and destructive ulcerations. The *blood* may be impeded or altered by pus, and *bile*; it will then corrupt the various structures, till it reach the bones, and even marrow: here the cords of life are broken, and like a ship loosened from her anchorage, life departs." He adds, "dysentery and diarrhœa arise from *phlegm*; a superfluity of *fire* is the cause of continued fever, quotidians are due to an excess of *air*, tertians to that of *water*, and quartans to that of *earth*."†

Now, gentlemen, let us see what the Hindoo SUSHRUTA says. "When *air* is deranged in the *blood*, it produces different painful eruptions, and tumours. When deranged with *fat*, it produces tumours, without pain. In *vessels*, it produces a contraction of their size, with pain and fulness. In *tendons*, it produces paralysis, with shaking pain and spasm. In *joints*, it

* Hindu Medicine, T. A. WISE, M. D., p. 214.

† PLATONIS Op. Om. a Bekker. Timæus, c. 67.

produces stiffness, pain, swelling, and emaciation; in the *bones* it produces pain and emaciation; in the *marrow* it causes acute pain. It produces rigidity of parts *(apotanoka)* by which the body is drawn aside, or backwards or forwards (tetanus,) and there is another form of the disease called *dhunus stamba* (trismus.) It affects particularly the lower jaw, and face, by drawing the neighbouring parts to one side or another. Chorea (St. Vitus' dance) *(kalaia khunja)* is according to the 'Nedana'* and SUSHRUTA also produced by derangements of air.

Observe also that the very same causes, the seasons, which are assigned by HIPPOCRATES,† SUSHRUTA also gives for *bile* increasing in *hot* weather, *phlegm* in *cold*. "When exposed to anger, to *hot weather*, especially during the months of September and October, and the middle of the day, or middle watch of the night the *bile is increased*. When *bile* is in unusual quantity it produces a disagreeable breath, hot and sour eructations, *with boils over the body*. The person is subject to fits of anger, his bowels are open, the skin distended, and he staggers as if drunk; *his body is hot*, the perspiration copious."

"When *air* is deranged with *bile* it produces *inflammation* and fainting; with *phlegm*, coldness and swelling of the affected part; *with blood* it produces a degree of pain like the penetration of a needle, sometimes deprivation of healthy sensation, and other symptoms of deranged *bile*."

Thus far we have SUSHRUTA upon *bile*. As for cold weather, and its product cold phlegm, he says, "The derangements of *phlegm*, are more liable to occur in the dewy, *cold, and spring months*, during the first third of the day, and after eating, produce a fulness of the abdomen, and the food the person eats is not properly digested; he has no appetite, and his body is

* MADHABAKARA is said to be the author. A. W.

† HIPPOCRATIS Op. lib. "*de natura hominis*, fol. 26. Lugduni Edit. 12 mo. 1564."

pale, heavy, *cold*, and hard. The cure of these derangements is accompanied by the use *of dry* food."*

Now, gentlemen, I leave PLATO and HIPPOCRATES. You will, I think, agree with me that they are one in theory with the Hindoo sages SUSHRUTA and CHARAKA. If you really enter into their principles of the elemental theory, you will find in them the guide to ancient books upon Medicine. I have particularly dwelt upon the opinions of these two celebrated Greeks, as representing in fact the two great classes of medical men, till GALEN, who in a book devoted to the purpose ("*de Hippocratis et Platonis decretis*,") endeavoured to harmonize their principles. One class were dazzled with the lofty conceptions and captivating eloquence of PLATO; another followed the more exact observation of Nature, and the cautious induction from experience, so conspicuous in his great contemporary. These last were so few, however, at the time when the illustrious GALEN appeared, that real practical medicine, as before mentioned, was well-nigh overwhelmed beneath the foreign pomp of various sciences and dogmas. Nor did GALEN himself ever attain to the truthful simplicity of the Coan Physician in clinical medicine.

The Hindoo doctrines, based upon the Vedas and Shastras, ever continued in India immutably the same. In Greece and Rome, great was the strife between the different sects in applying their various theories to the art of Medicine. Yet Dogmatists, Methodists, and Empirics, never wholly rejected the elemental theory. In the system of GALEN himself, especially in his therapeutics, it holds a prominent place. "He conceives that the properties of all medicines are derived from what he calls their elementary or cardinal qualities, heat, cold, moisture, and dryness. Each of these qualities is

* Hindu System of Medicine, T. A. WISE, M. D., p. 217.

again subdivided into four degrees, and a plant or medicine, according to his notion, is cold or hot in the first, second, third, or fourth gradation; if the disease be hot, or cold in any of these four stages, a medicine possessed of a contrary quality, and in the same proportionate degree of elementary heat, or cold, must be prescribed."* This is a strange web of philosophical fiction! Yet a general belief in the hot and cold inherent qualities of medicines at this day pervades the whole of India. The most illiterate cooly, as well as the most learned Pundit, explains the action of medicines upon this Galenical principle only.

That the immortal GALEN should be led away to such an absurd hypothesis, only proves the power of preconceived ideas. In more important matters the acute intelligence of this great man, could wrestle against the prevailing notions, and spurn with indignation the impious opinions, (never imputed to the ancient Hindoo sages) that the glorious organization of the human frame, is the mere fortuitous aggregation of atoms, brought together by blind chance. With an admirable exertion of his reasoning powers, he could, and did infer from the exquisite mechanism of the thing made, that there must be a MAKER.

" What," he says, " if you see a couch, you infer it was *made* to lie upon; if a boat, that it was *made* for floating in; if a house, its doors, its windows, and the proportion of its rooms, would lead you to infer it was *made* for human habitation. Yet you can look at man's eye, at man's heart, at man's hand even, and believe these all chance work!" He breaks out into this remarkable passage " Who this God may be, I know not; but unknown I adore."† Again in his book " *upon the uses of parts*," he

* Pharmacologia, J. A. PARIS, M. D., London, 1829, p. 37.

† GALENI. Op. Edit. Frob. 1561. Basil, " de Hippoc. et Platon. decretis" lib. IX. Cap. 8, p. 571.

says* " But to waste words upon such brutish people, is only to be censured by better men, who will deem it but a profanation of the sacred gift of speech; of that language, by which I now compose this book, a real Hymn, to the praise of our GREAT CREATOR. For, in my opinion, true religion consists not so much in sacrificing ten thousands of bulls upon his altars; nor in offering before him costly incense, and fragrant perfumes; as in first ourselves apprehending HIM; and then making known unto others, HIS unerring wisdom; HIS resistless power; HIS all diffusive goodness. For to have beautified all his works, with such appropriate grace, to have excluded nothing from participation in his benefits, is a most manifest proof of ineffable goodness; a goodness most worthy of our hymns of praise. Whilst to have known how best to effect this highest perfection of his works, declares his infinite wisdom. His almighty and all sufficient power is seen in this, that all things are made by his own sovereign will."†

These were the sublime conceptions of GALEN. It would do us no harm, if in our investigations and studies we could imitate his piety. This tones and strengthens the spirit for those deep researches in which he was so successful.

His comprehensive mind was trained, and led on by his own experiments, to conclude,—that the nerves were not ligaments as they seemed to be to others;‡ but conductors of sensation and motion, by means of a subtle animal spirit, passing through their tubes:—that the arteries and left ventricle of the heart§ contained blood, not air, as was then believed; and for a thousand years afterwards, until our great countryman, HARVEY reproduced proofs to the contrary, derived from GALEN.

* GALENI, op. cit. lib. III. " lib. de usu part." Cap. X. p. 265."

† *See* Romans, Chap. I. v. 20.

‡ GAL. *de* HIPPOC. *et* PLATON *decretis*, lib. I. Cap. IX. p. 467, Vol. I.

§ *Ibid*, Cap. 5, Cap. 6.

Again, that the lungs got rid of the fuliginous part of the blood; that blood in the veins was darker than that in the arteries;* that anastomosis took place between the extreme vessels; lastly that the valves of the heart prevented regurgitation of blood, was distinctly asserted by him. When we see him proving in spite of all cavil, that the voice did *not* proceed from the head as ZENO† declared, but from the larynx; that arteries *do not* degenerate into nerves as PRAXAGORAS affirmed;‡ that the heart *is not* the seat of intelligence, as said to be by CHRYSIPPUS, but the brain;§ that the carotid arteries *do not* carry spirit to the brain as ERASISTRATUS maintained, but blood;‖ when we see bones and ligaments, joints and muscles, and viscera and senses described, reverentially admired, and understood, we are constrained to admit that he was really worthy of that glorious estimation in which he was held: a fame to which no one in our profession has since attained. For to the right methods of investigation which GALEN introduced, *i. e.*, experiment as opposed to conjecture, medicine owes its establishment as a science, and its emancipation from false theories and absurd conceits. Grand steps are these which I have enumerated towards our present Physiology; few of which appear to have been known to the Hindoos.—They knew, however, of the existence of the lacteals which he did not; nor we either, until 1615. They asserted that the chyle (globule) got its red color in the spleen, which is, I think, probable.¶

* GALENI, op. cit. *lib. VI.* '*de usu part.*' Cap. 14, Cap. 17. Cap. 16. *Ibid, an sanguis in arteriis natura contineatur.* Cap. 8, p. 124. *Ibid*, lib. '*de usu pulsuum*,' Cap. 5, p. 457.

† GAL. *de* HIPPOC. *et* PLATON *decretis*, lib. II. Cap. 5.

‡ *Ibid*, lib. 1, Cap. 7.

§ *Ibid*, lib. iii. Cap. 6.

‖ *lib.* de utilitate resp. Cap. 5, p. 452.

¶ Pathologia Indica, ALLAN WEBB, *part* ii., 2nd Edit. Calcutta, 1848, p. 204.

But so prodigious are the attainments of some men now-a-day, so inituitive their "*subjanta genius*," that they exclaim against the folly of searching out medical opinions before the time of JOHN HUNTER! JOHN HUNTER was a great man, ASTLEY COOPER, and JOHN ABERNETHY too were eminent, but they might have learned from a greater still. Both these surgeons taught that a broken spine was incurable. So I believed;—but tried to reduce one once, here, in Calcutta, and cured my patient. But when, elated with my success, I was about to publish this novel and wonderful case, I found GALEN had been before me, had got it all in '*his book*.'* I remember too a case (not mine,) of removing a piece of the sternum, and so exposing the heart, to relieve matter pressing upon it, behind the bone. This was quoted as a daring feat of *modern* surgery. I found it done sixteen centuries ago; and *Old* GALEN rather glorifies himself thereupon.†

History of Medicine, Middle Ages.

For one thousand years at least, wherever medicine was taught as a science, the works of GALEN were appealed to as infallible. With a regard not less reverential than that of the Hindoos for their Vedas and Shastras, did the Christian world of Europe, and the Moslem world of Asia, look to him, as respects matters medical. He, and AVICENNA his successful imitator, were the chief authorities upon Medicine during that long, dark night, when monkish superstition overshadowed, and well-nigh extinguished in Europe, the light of science. The invention of printing in 1440, and the glorious reformation, dispelled this Egyptian darkness. The mind of Europe awoke. But no such light broke upon India. Until the institution of this College, as regards the science of

* GAL. in lib. 'HIPP *de articulis commentar.*' lib. iii., Cap. 46, Vol. iii., p. 545. See the very curious plates Edit. Frob. 1561. Basil.

† GAL. *de Anat. Administr.* lib. vii., Cap. 12 et 13.

Medicine, India had not advanced one step since invaded by ALEXANDER. In Europe even, those powerful levers of modern medical science, Chemistry and the Microscope, have but lately burst open the hidden secrets of physical existence, and finally dispelled the elemental theory. "How little progress had been made till a very recent period in the examination of the nature of bodies as opposed to their movement, may be well understood from this fact, that in the popular works on science which were in circulation in our own childhood, fire, air, earth, and water, were still represented as the four elements of the universe. To what point the inquiry into these subjects may be carried hereafter, it seems impossible to anticipate: the doctrine of atoms appears indeed to be bringing us to the very elements of physical existence; while the study of the phenomena of Electricity, of Magnetism, and above all of what is called *Animal Magnetism,* seems to promise that in the course of years, or it may be of centuries, we may arrive at some glimpses of a yet higher mystery, the relations of physical and moral existence towards each other, and the principle of animal life."*

During these middle ages little was added of importance to Medical Science. India was perhaps in advance of Europe as respects practical medicine. Anatomy was not taught by dissections till in 1315, MONDINI DI LUZZI publicly demonstrated at Bologna in Italy.† The Arabs, more strictly fettered by their religious creed than the Hindoos, were prohibited absolutely from the practical study of Anatomy; whatever they did know upon the subject they derived from the Greeks, and GALEN was their chief authority. For many years after I

* Divisions and mutual relations of knowledge, a lecture by T. ARNOLD, D. D., Rugby, 1839, p. 11.

† Hist. Prag. de la Medicine, KURT SPRENGEL, Sect. vii., Vol. ii. p. 485.

became attached to this College, the Students who formed the great majority of the Hindoostani class, being Mahomedans, it was supposed impossible to engage them in practical dissections. Many an earnest consultation have I had with Pundit MOODOOSODEN GUPTOO upon this subject. He was sanguine of success as respects them, if in dissection they should be allowed the same opportunities with the English class. When the dissecting rooms were placed by Government under my charge,* the wish of my good friend was accomplished; and he did succeed, with one or two exceptions, in engaging the Military Students of the class in actual practical dissections. I had at that time, and have often had it since, the great satisfaction of recording publicly the efficient attainments of this class of students. Taught in the Oordoo language, their only Manual of Anatomy, the notes they had taken at the Pundit's lectures, the admirable perseverance of these young men overcame all difficulties under the kindly guidance of their preceptor. This College achieved another triumph, and Pundit MOODOOSODEN GUPTOO gained another laurel, when for the first time in India at all events, Mahomedans were seen in classes, engaged in dissections; studying Anatomy in their own language. We must all rejoice at the success of this great experiment, which has, in the vernacular tongue, brought within the grasp of the people that knowledge which is of all others the foundation of medical science. Now that the splendid work upon Anatomy, which my colleague Dr. MOUAT has completed, in the Oordoo language, is in the hands of these Students, their difficulties are much less. It is, I apprehend, the first work upon the subject, which has been compiled for Mahomedan students since the time of GALEN.†

* Appointed Professor of Military Surgery 1845.

† CLOT BEY may have done in Egypt something of the same kind?

We have seen that neither in Anatomy, nor in Physiology, nor in Pathology even, did the ancient Hindoos ever so much as get into the right road. The Greeks did. They studied Anatomy by dissection, Physiology by experiment, by observation, and by the light of Comparative Anatomy; as the works of ARISTOTLE* who had charge of that great museum formed at Alexandria, where animals were assembled from all parts of the world, at such a vast expense sufficiently indicate. There is nothing in the Hindoo authors that I know of that deserves the name of Clinical Medicine. Yet the cases left us by HIPPOCRATES are recorded with so much care, so much accuracy, and so much of what I may call propriety, by which I mean the proportion which each part bears to the whole, that they are models of imitation to this day. They are, in fact, just such abstracts as I in this theatre, have repeatedly urged you to make out, from your own daily history of cases; when the case is closed. All the great features should be boldly drawn, the treatment briefly indicated, and the result stated.†

Morbid Anatomy.

Now, gentlemen, you see that such acute reasoners as were the sages of India and of Greece, they could not by mere reasoning and conjecture understand or explain disease: and if you analyse your own knowledge, you will find that besides your Anatomy and Physiology, so widely extended beyond theirs, you have been taught to understand diseased actions by means of *Morbid Anatomy.*

* "Alexandre fut aussi le protecteur des arts et des sciences, et il concut une telle estime pour le célèbre Aristote, son maitre, qui lui en avait inspiré le goût, qu'il lui fit don du Nymphéum, campagne près de Mieza, où il put se livrer sans trouble à ses recherches sur la nature. Plutarch, Vita, Alexandr, p. 668. * * * * * * * * * * * *

Quelques auteurs, entre autres Athénée, pretendent qu'Aristote recut d'Alexandre jusqu'à huit cents talens pour servir à ses recherches sur l'histoire naturelle; mais on peut croire que cette somme est exagérée." *Vide* Sculze, p. 358. Histoire prag. de la Medicine, Tom. I. Sect. IV., p. 417.

† HIPPOCRATIS Op. Om. fol. Edit. Francof. 1624, lib. iii. lib. vii. de morb. vulgar.

This study which has beyond all others contributed in modern times to the progress of our art, and which was scarcely known to the ancients, seems to have grown up almost accidentally under those great men who in Italy first taught publicly by human dissections. The bodies were procured from the hospitals, which were at first established rather as refuges for the destitute, than as infirmaries for the sick. But the Great MORGAGNI never let pass any opportunity of enquiring into the cause of death in the bodies upon which he publicly demonstrated. All his facts were recorded; and compared with those he could obtain from others; and his great work "*De sedibus et causis morborum*" was the result.

In Europe, the Schools of Medicine generally rose up in the neighbourhood of hospitals. Others followed in the tract of the Great MORGAGNI, and morbid anatomy is now a science. *Clinical Experience and Morbid Anatomy are our best guides to a knowledge of disease.*

In 1843 the museum of our College was constituted by the orders of Government a '*central depôt for pathological contributions, from every part of the Indian Empire.*' The conservation, arrangement, and classification of the specimens, was for many years a part of my office. You now see assembled from all parts of India, preparations of diseased structure, *an Indian Museum of Morbid Anatomy.* In order to make it more generally useful I published a work founded upon these specimens which I hope may yet be completed. In this 'Pathologia Indica' I have been zealously aided by our own students, and I have gratefully recorded it.* But we must go on my

* '*Pathologia Indica,*' or the Anatomy of Indian Diseases, based upon the morbid specimens in the Museum of the Calcutta Medical College: by ALLAN WEBB, B. M. S., 2nd Edition, Calcutta, 1848, *see* Part I. p. 149, p. 57, Part II. p. 325 &c., and the work generally for cases by students.

young friends, the work is for you and those who come after to complete. Do not think even when you leave this College that all is done. Remember the melancholy catalogue of diseases, which are not yet understood, are not cured; leprosy, pthisis, cholera and elephantiasis, are such; besides a long list of nervous disease *the scandala medicorum.*

But what could the ancients do in explaining disease without this knowledge of Morbid Anatomy. If you are not weary, we will see how they applied their theories.

Suppose we examine diseases of the eye, according to SUSHRUTA'S Pathology. He says "the flesh of the eye being produced from the earth, the blood from the fire, the black parts from the air, the white parts from the water, and the canals for the tears from the ether." "Its inflammations are of four kinds, produced, by derangement of the humors, *air, bile, phlegm* and *blood*; the humors when diseased, passing into vessels of the eye. Of *blood* it is said, if diseased, it will destroy the organ in five days—if *phlegm* in seven days—*if air* in six days—if *bile* in one day" !!*

Now the eye being transparent, we can *see* what goes on in disease. A modern surgeon sees ulcers in the cornea, he knows that their cicatrization may render this part of the eye permanently opaque. If the ulcer progress, layer after layer of the cornea may give way, and the *internal* humors be evacuated. If the iris be attacked with inflammation the pupil may be closed by adhesion, and the access of light to the retina intercepted. The lens itself or its capsule becomes opaque, and blindness follows. Now, in all these instances, there is no vague idea respecting *blood, phlegm,* and *bile;* but the surgeon is directed in his methods of cure, by the actual condition of the structures which he has for himself observed.

* Hindu system of medicine, T. A. WISE, M. D., 1845, pp. 292, 293.

In like manner if we take disease of the heart, and examine SUSHRUTA'S views.—Thus "when produced by deranged *air,* it is said to be accompanied by acute pain—when by deranged *bile,* it produces fainting—when by *phlegm,* the patient feels heaviness at the heart."* The methods of cure are directed specially to each of these conditions. Now what does morbid anatomy shew us. We look in our Museum at the structure of the heart diseased; and find in one instance, that its muscular walls are thickened to double their usual size, producing one set of symptoms;—or we see them reduced to the thinness of an orange-peel, with another set of symptoms;—or that its cavities are greatly contracted, or preternaturally dilated;—or its valves will not act; for they may have become torn, or ulcerated, or encrusted with vegetations. In each of these conditions we discern a cause for the existing symptoms. We even find in some of these lesions of the heart which retard the blood, making it to stagnate in the returning vessels, as the branches of the venæ cavæ, a proximate cause for various kinds of dropsy. But if we were to search for the causation of this last disease in the writings of SUSHRUTA or CHARAKA, or any other Hindoo Sage, we still find the same story, "Of heart disease three kinds are produced by *air, bile* and *phlegm* when affected separately, —three when two humors are deranged—one when three are deranged at the same time."† These four words, *air, blood, phlegm, bile,* as fully explain the mysteries of Hindoo pathology, as, '*pax vobiscum*,' represents in the mouth of WAMBA, the son of WITLESS, all requisite learning, all monkish theology.‡

* Hindoo Medicine, T. A. WISE, pp. 369 and 427, &c.

† Op. Cit., p. 326.

‡ IVANHOE.

It has been said that practical medicine among the ancient Hindoos had attained to greater eminence than the ruins of their pathology which we have been considering would indicate. In therapeutics we do hear of cures now-a-days of epilepsy and lepra, by combinations of drugs reputed to be of great antiquity. Professor ROYLE proves that Greeks and Arabs borrowed from their materia medica. In midwifery we find that embryotomy was practised, and rules laid down for delivery. In surgery lithotomy is described, operations for new ears and noses, for piles, fistula, cataract, &c. But among the ruins of ancient Hindoo Medicine, the practice of Mesmerism may, I think, be mentioned as most curious. By passes and breathings those itinerant priests of ESCULAPIUS, the '*Jhar phonknawallas*,'* profess to cure, and do cure rheumatism, palsy, epilepsy, just such as Mesmerism is known to cure. Assiduously muttering their munters, they yet continue to make passes from head to foot; the body of the operator being kept steadily in contact or relation with his patient. To these and these only may fairly be attributed the cure. And so general is the practice that there is hardly a village in India, in which it does not exist.

Ancient Hindu Practical Medicine.

In the Mesmeric Hospital, so successfully established by Government in this city under the superintendence of Dr. ESDAILE,—you have all witnessed, or you might have done so, at any time these last two years,—the power of animal magnetism to render the human frame absolutely insensible to pain during the most formidable operations of surgery. But what is of still more importance, you might have seen also the power of this subtle agent to cure different forms of paralysis. A Hindoo student was brought to me as acting Professor

* جهاز *Pass* پهونکنا *breathe* والا *person.*

of Medicine by one of your fellow students, probably now present, from a place some 25 miles off. The patient could express himself by writing in Persian or in Bengali, but had been dumb for a year and half;—after coma and fever. The tongue was immovably retracted. He was said to have consulted in vain most eminent physicians in this city. I advised Mesmerism, the liberality of Dr. ESDAILE provided means, he was cured in his hospital by his Native Mesmerisers in about a fortnight; and can now speak as well as ever he did. This is not a solitary instance.

The practicability, which has been daily demonstrated in the Mesmeric Hospital in this city, of performing the most dreadful operations of Surgery without pain to the patient, must be regarded as the greatest medical triumph in our own days. I cannot now recal without astonishment at what I witnessed the extirpation of a cancerous eye, while the man looked at me unwinkingly, unflinchingly, with the other eye. Another man looked dreamingly on with half-closed eyes, the whole time of an operation, even whilst I examined the nature of the malignant tumour I had removed, and then having satisfied myself, concluded the operation. The use of chloroform and other anæsthetic agents, which are universally adopted now, followed as necessarily upon the discovery of the anæsthetic power of animal magnetism,* as did the use of the ligature to suppress bleeding, upon the discovery of the circulation. Now the surgeon being able to command the effusion of blood either by pressing upon the blood-vessels or

* This term is used by me, as more intelligible to the students than that of "*Animal odyle, or odylic influence*," which has been substituted by BARON VON REICHENBACH, (see Researches on Magnetism, part I. p. 164,) in a work which has done more to clear up the study of what I must once again call animal magnetism than any thing ever yet attempted. This '*odylic influence*' is quite as powerfully developed in a crystal as in a magnet. The human hand may be charged with it from a crystal or a magnet; but the

by tying them, and by Mesmerism or chloroform to render his operation painless, there seems but little left to desire in surgery but real anatomical skill.

But in justice also to the Hindoos we may add that it is very probable that at a time, 1460, when in Europe Colot, an eminent surgeon, was obliged to beg a man's life from the gallows, in order to prove that the operation of lithotomy was not necessarily fatal,* this very operation was in com-

hand charged will not attract iron filings, neither will the crystal, therefore, although *like* magnetism it is yet different. It is *luminous* in the dark, in the magnet, the crystal, and the *human hand*: and howsoever obtained, from digestion, chemical decomposition, the sun's rays, from heat, or from electricity, its lambent light is seen by *sensitive eyes*, and the power has upon them its peculiar effects. Many people in Calcutta, not sensitives, saw light as of fire, pass between the hand of Mr. Alin and the head of his subject, whom he was attracting. This I did not see, but heard from their own lips. *I have seen* in Dr. Esdaile's Hospital bodies charged 'odylically,' (I may not say magnetized) produce the same effect upon his '*sensitives*', (Hindoo patients,) or even more striking effects than those recorded by the Baron, as seen at Vienna. A piece of paper no bigger than a wafer, charged odylically, and dropped upon the patient's hand, has rendered it insensible, and fixed it to the bed; a brick floor charged odylically has tied a man by the leg; a good stare at a plaster wall has charged *it* odylically, so that a man passing by and his head placed against it, has been so forcibly attracted, he could by no means get away; a gold watch-guard charged odylically has rendered rigid and insensible any limb upon which it was wound; even a glass of water charged in like manner has had like effects. Dr. Esdaile rarely walks abroad without a spare charge or two at the service of his friends. And some hundreds of the students were present, when at my request, and for demonstration at my anatomical lecture, he put on his spectacles and charged by a good stare a poor cooly in the next room, till he was brought in insensible; and every important group of muscles demonstrated on the *living* body, in their proper action, one after another:—the theatre offering from top to bottom a sea of living wondering heads, for it had been noised abroad in the College that "*the dead man was living*," and standing upright!

* Colot, surgeon to Louis XI., the man was to be pardoned if he consented, and lived; which he did. History of Medicine, W. Hamilton, Vol. I. p. 397.

mon use by the *Baidias* of India. But here again, gentlemen, how vast the difference between the marvellous rapidity and success of this operation in the hands of your Professor of Surgery, and the rude barbarism of Sushruta. At the Native Hospital I have seen large stones crushed in the bladder, and thus removed by my former colleague Dr. Jackson, without pain and without cutting at all; or if cutting be required the patient is first made insensible to pain by chloroform. In a report of that hospital, which has just been published (1850,) it is said "it cannot fail to be a subject of thankfulness and gratification to the Governors to be assured that in one hundred and thirty-two operations, which have been performed in the Native Hospital during the years 1848 and 1849, not one case has occurred in which death could be traced to the use of chloroform." Yet it was used in all of them.

I find the operation for cataract is fairly described by Sushruta. It was generally practised in this country before we arrived. It is probable too that even at a time when the princes of Europe could find no oculist and were obliged to send into Asia,* this operation was common in India. It is very true that the itinerant Baidias do occasionally poke out eyes; but it is equally true that I have seen in various parts of India† many eyes to which they had restored sight.

The glory therefore of *introducing* this operation into India does not fairly belong to us. In a modified sense only can we claim for this College the praise so eloquently accorded by Colonel Sykes—"I affirm, (he says) that this faculty given to a single native to perform the godlike office of restoring the blind of his countrymen to sight, is a more

* Hist. Pragm. de la Med., Kurt Sprengel, Vol. II. Sect. vii., p. 254.

† At that fine institution the Government eye-infirmary in this city, in charge of my friend Dr. Martin, many such cases are met with. He points out a tremulous shaking motion of the iris as common to their operations even when successful.

glorious monument than all the works of art that human pride or human ambition have ever burthened the earth with;" It is for you, gentlemen, to raise that peaceful trophy to a wise Government for founding this College, which its eloquent advocate, already quoted, desires. Do but succeed, and then with him, "I say, and with a thorough conviction of the truth of my assertion, in case the seeds of knowledge we have sown fructify to a general and luxurious harvest, that we shall have left a monument compared with which those of ASHOKA, CHUNDRA GUPTA, and SHAH JEHAN, or any other Indian potentate sink into insignificance."*

Curriculum of studies.

And now, gentlemen, if you contrast the means by which we endeavour to instruct you in the science of medicine, with those which I have alluded to, as practised by the ancients, you will, I think, find reason to congratulate yourselves. Medicine is not an exact science in itself; but we endeavour to furnish you with exact knowledge of sciences which may be applied to the ever varying forms of disease. Your early studies will be I. Chemistry, II. Botany, III. Materia Medica, and IV. Anatomy. Of the application of Anatomy I need say no more, perhaps I have already magnified my office, but without it you can do nothing.

By a knowledge of Chemistry you see that the air, the earth, and the water, are themselves compound bodies; and are decomposed and changed by our own living organism; in which composition and decomposition are perpetually going on. The used-up and effete parts of our bodies being thrown out by one set of organs, and new matter assimilated from our food, deposited by another set of organs. Even in diseased processes noxious products are generated, often to be detected by chemical tests.

* General Report on Public Instruction in Bengal, 1847-48, p. 94.

By one of the most admirable combinations of profound thoughts to which our age can point, M. LIEBIG has led us to the conception, that all our motive power is derived from the processes of digestion and nutrition, and all our animal heat from respiration. In other words both *our motive power and heat are derived from chemical action.* The so-called animal magnetism is associated, says Baron REICHENBACH, with animal heat, and comes, goes, flows out, and is dissipated, like it. The chemical action of the body which yields heat, yields also, he says, crystalline force, magnetism, or whatever we choose to call this peculiar influence. *This is the origin of the force which flows in a polar form, from our hands and fingers as from a magnet.**

Botany signifies no longer a mere catalogue of plants. It is not studied only to identify those numerous plants which are used as medicines. It now assumes as a branch of medical instruction a most important place. Its microscopical demonstrations, so simple, so exquisitely beautiful, have an immediate application to the structural anatomy of our own bodies. The production of cells, the growth of cells, the arrangement of cells, whether flattened into membranes, or elongated into tubes, are demonstrated with such a clear simplicity, as can scarcely be attained in animal bodies. The structural anatomy of plants, therefore, so constantly shown at the lecture of the Professor of Botany, forms a delightful introduction to human structural anatomy. The production of oil and fat in plants through the intervention of cells, is so like that which we observe in animals, that the difference is hardly to be detected; but in plants you *see* the mode of its production.

* Researches on Magnetism, Heat, Light, Electricity, Crystallization and Chemical Attraction in their relations to vital force, by KARL BARON VON REICHENBACH, translated by W. GREGORY, M. D., Professor of Chemistry. Edin. London, 1850, part I., 2nd Edit. p. 122.

When we find fat occupying the place of the muscular structure of the heart in man, or blocking up the liver, and oil globules even in the interior of the muscular fibre, this disease reminds us of vegetable growth. Colloid and cancer appear to grow with their own independent vegetative vitality. The line of demarkation between healthy and diseased growths is often not easily found. Besides this, real vegetable growths are produced, increase, and multiply in the living human body, and constitute disease ; especially upon mucous membranes. One remarkable instance of this in the air passages, occurred in a patient of mine in Calcutta. She coughed up lumps of fat, and flakes of vegetable membrane, more than would suffice to cover twice over the whole of the air tubes ; which they occasionally blocked up, to the imminent hazard of suffocation. This vegetable mould of fungi and fuci, commenced growing about the end of the rains, when in Bengal, the hat you take off at night is mouldy before morning.

It required a most intimate acquaintance with the elementary forms of animal and vegetable tissues, and the aid of chemistry and the microscope, to detect their real nature. In this instance it is to the Professor of Physiology I owe the discovery.* From his lectures you will learn how the recent discoveries of normal cellular growths explain the production of diseased cellular growths. From him you will acquire also a knowledge of floating cells;—of the blood.

The Professor of Materia Medica requires your knowledge of Chemistry, and of Botany, and of Physiology, as preliminary to your understanding the composition of drugs, and their peculiar virtues, or their operation as medicines. A right

* I trust that Professor WALKER will ere long publish his discoveries respecting the nature and manner of growth of these microscopic plants.

understanding of the healthy condition of the blood must precede our knowledge of its diseases, and of their remedies. This again is only acquired by the study of microscopic anatomy, and the chemistry of molecular matter. "Thus it was the observation of the deficiency of red globules in the blood of the tuberculous, (which is always accompanied by deficiency or vitiation of the fibrine) that first suggested the propriety of employing iron in that diathesis; and a similar deficiency of carbon, or the oil globule in the elaborated chyle, (which is also always accompanied by some defect of the fibrine) in like manner led to the use of the cod-liver oil."*

You will see therefore, my young friends, that these sciences Anatomy, Chemistry and Botany, engage your attention during the first years of your studies.

General Anatomy and Physiology, the theory and practice of medicine, the operative parts of medicine,—surgery and midwifery—will then be studied, under their special Professors; and their actual application pointed out in the wards of the Medical Hospital, of the Surgical Hospital, and of the Female Hospital. This is what is called technically "*walking the hospitals*"; where you observe diseases for yourselves, aided by these preliminary studies, and clinical instruction from your Professors. The general application of medical science to legal investigations will be shewn by our new Professor of Medical Jurisprudence.

But, believe me, gentlemen, that you are greatly mistaken if you think that your work is ended when you get your diplomas in our profession. You must ever continue to be students, you cannot even stand still. It is when you leave this College, that the most valuable part of your education

* Introductory Lecture to the Clinical Courses of Medicine, D. NELSON, M. D., 1849, p. 17. Delivered at the Birmingham School of Medicine.

begins. Then you must apply with all earnestness to educate yourselves in the observation and treatment of diseases; *record* your observations, reflect on your observations, and communicate with others upon the results. It is only in this way that our science advances. India presents for you a fine field of observation. I trust that the Graduates of our College, now a numerous band of well educated men, will find some means of communicating and *publishing* the facts they may discover. I should be glad that any observations of mine should lead to a result so practically important.* Bombay and Madras both possess flourishing schools of medicine. It is not likely therefore that you will lack competitors for fame.

Finally, I would conclude in the words of a true friend of yours, the Honorable Mr. MILLET, and they are words of weighty import. "Consider seriously the nature of the honorable profession you have chosen. It will be yours—God's blessing resting upon your labours—to assuage bodily pain, to prevent fatal or disabling effects of the many injuries and disorders to which the human frame, in the varied circumstances of life, is liable; to restore sight to the blind, and oftentimes to prolong life when to all outward appearance it is hastening to its close, these are great talents committed to you—see that you duly improve them."

This, gentlemen, is the noble Charter of our profession—"DO GOOD UNTO ALL MEN."

And now with every good wish for your future success in life I heartily bid you farewell.

THE END.

* There is not a single Medical Journal now, I believe, in all India! Is this reproach to continue?—A. W.

J. C. SHERRIFF, BENGAL MILITARY ORPHAN PRESS.

A

CLINICAL REPORT

ON THE

CASES OF PNEUMONIA TREATED IN THE CLINICAL WARD OF THE JAMSETJEE JEJEEBHOY HOSPITAL, DURING THE SIX YEARS FROM 1848 TO 1853.

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DURING the six years from 1848 to 1853, 76 cases of primary pneumonia, and 27* of pneumonia complicating intermittent or remittent fever, have been treated in the clinical ward. The record of these cases is full and accurate. They were all under my immediate observation. My remarks, therefore, will chiefly have reference to them; yet I shall not hesitate occasionally to refer to my own experience, or that of others, in this disease, in other wards of the hospital.

My present subject, then, is not the general history of pneumonia, nor, indeed, that of all the circumstances of the disease which I have myself witnessed, but merely a description of it as it occurs in the hospital-frequenting classes of the Native community of Bombay.

The account of primary pneumonia, and of that which complicates malarious fever, have been included in one report. This arrangement has been adopted because questions may arise relative to the pathology, symptoms, and treatment of inflammation of the lungs, in the consideration of which a comparison of the two forms may be found useful.

I shall use the term "*Primary Pneumonia*" in its generally

* Of these 23 complicated remittent fever, and 4 intermittent fever.

received sense. For convenience sake, I shall designate by the term "*Febrile*" the pneumonia which has been observed as a complication of intermittent and remittent fever: in this restricted sense the term must be understood when used in this report.

The points of interest in the 103 cases admitted into the clinical ward during the period included in this report, and the reflections to which they give rise, are arranged under the following heads:—*1st*,—ETIOLOGY; *2nd*,—PATHOLOGY; *3rd*,—SYMPTOMS; *4th*,—TREATMENT.

ETIOLOGY.

Sex.—The question of the influence of difference of sex in creating a predisposition to pneumonia will not receive any elucidation from these cases—they are all of males.

Age.—The greater or less prevalence and mortality of this disease at different periods of life is a subject of interesting inquiry. This report, however, will not tend much to advance it. The hospital is for the reception of adults. The hospital-frequenting classes chiefly consist of day-labourers, peons, cart-drivers, domestic servants, and sailors. Many of them are natives of other parts of the country, who resort to Bombay for a season, in pursuit of the means of subsistence. They are chiefly individuals in the vigour of life. Of the subjects of our present cases, 57 were between the ages of 21 and 30; 22 between 31 and 40; only 11 between 10 and 20; and 9 above 40.

Caste.—The castes from which these clinical patients were selected have been, with one exception, Hindoos, Mussulmans, and Native Christians: there are 49 Hindoos, 40 Mussulmans, and 13 Native Christians. This is about the ratio of the total hospital admissions of these castes. In this statement, then, there is no evidence of liability to pneumonia being caused by peculiarities in the customs of these different classes. Yet there is an interesting fact to be deduced from these cases, which is probably related to caste customs. The mortality among the Hindoos and Mussulmans has been about one in three; that of the Native Christians not quite one in six. On referring to the duration of the disease before admission, I find that of the 71

recovered cases, only 20 were admitted within five days of the commencement of illness: of these 9 are Native Christians. From this statement, then, it is a fair inference, that though pneumonia has been as prevalent among the Native Christians as the other two castes, it has been much more successfully treated, in consequence of the earlier application for relief.

Habits, and State of Constitution.—The state of constitution, and the habits of these patients, have in all probability had a share in causing the disease. Of 101, whose state of constitution on admission is noted, 63 were asthenic, and the condition of 38 is stated to have been good, or tolerable. Of the asthenic patients, about one in three died; of the others about one in four.

The habits of 77 are stated: of these, 46 allowed that they were in the practice of using spirituous liquors; 31 denied it.

Seasons.—On referring to the total hospital admissions of primary pneumonia, during the six years to which this report relates, it is found that in the year 1849 the number was one-third more than the average of the other years. On comparing the monthly admissions for the whole period, it appears that in the six months from December to May the admissions were 189; but in the six months from June to November 120—a difference of 69 in favour of the winter and spring. These results are deduced from the consideration of 309 cases.

In M. Grisolle's elaborate work on pneumonia, there is a table* which exhibits the months of admission in Paris of 296

* The statements in detail are subjoined:—

	Bombay.	Paris.
January	30	20
February	39	40
March	32	47
April	27	62
May	27	40
June	23	8
July	9	13
August	18	3
September	21	5
October	29	2
November	20	22
December	34	34
	309	296

cases. It will be useful to compare these statements, with the view of determining to what extent there is correspondence or difference in the seasons of greatest prevalence of pneumonia in the climates of Paris and Bombay. In both we find the disease more common in the six months from December to May than in those from June to November. But the difference is more marked in one climate than in the other. In Paris it is 190, in Bombay 69. When the month of November is excluded, and the admissions in the two places from June to October are compared, it appears that in Bombay there were 100, in Paris 31.

There is, then, in Bombay, a greater proportion of admissions in the summer and first half of autumn than in Paris. The cause is evident: June, July, August, and September are the monsoon months in Bombay—the season of the periodical rains. We have at this time wet, a moist atmosphere, and high winds, as causes of reduction of the temperature of the surface of the body.

These remarks have had reference to primary pneumonia. But when we regard the periods of admission of the 27 cases of *febrile* pneumonia included in this report, we find that the greatest monthly number is in July. When we compare the six months from June to November with those from December to May, we find that the admissions in the former have been 22, in the latter only 5. The difference between the seasons of greatest prevalence of primary and febrile pneumonia in Bombay would seem to be well marked. The explanation is plain: primary pneumonia is most common in the cold months of the year; febrile pneumonia, on the other hand, is necessarily most common in the months in which malarious fevers prevail most. This fact is important, as it may facilitate the diagnosis of the two forms. It is of importance to establish this diagnosis, from the bearing which we shall find it has on the treatment of the disease.

Causes assigned.—The patients have not in many instances attributed the attack to any particular cause: 9 traced it to cold or wet, 8 to fatigue and exposure, and 10 to blows more or less recently received. When we consider the season of greatest

prevalence of the primary form, the occupations of the inmates of the hospital, their exposure to vicissitudes of weather, their scanty clothing, and defective habitations, we are probably justified in regarding reduction of the temperature of the surface of the body as the common exciting cause of pneumonia here as elsewhere.

Pathology.

Before stating the important facts of these cases which may be most conveniently classed under this division, I am desirous of making a few general observations on the pathology of pneumonia. I am induced to follow this course in order that my subsequent remarks may be the better understood.

The first question that seems to me naturally to suggest itself relative to the pathology of pneumonia is the determination of the precise seat of the inflammation. I do not mean the question of whether the walls of the pulmonary air cells or their connecting areolar tissue be the structures affected with inflammatory action. This, though much discussed by pathologists, has never appeared to me a very important or difficult point to determine: if in inflammation of mucous and serous membranes we very generally find that the deranged action tends to extend to the areolar tissue subjacent to them, and to cause inflammatory deposits, more or less in different cases, to take place there, it is improbable that inflammation of the pulmonary cell walls can exist without tending to extend to, and cause deposits to take place more or less in the areolar tissue which connects the cells together, as well as into the cells themselves. The question to which I allude is, whether the capillaries of the bronchial arteries or those of the pulmonary artery are the seat of that deranged state of capillary circulation to which pathologists have applied the term inflammation. The answer appears to me simple and evident: if we adopt the opinion at present generally received, that inflammation is an altered state of the nutritive processes of the part affected, depending upon something faulty in one or other of the conditions of normal nutrition, then the capillaries concerned in inflammation must necessarily be only such as circulate in their normal state arterial blood for purposes of nutrition. The capillaries of the bronchial arteries are the nutrient vessels of the visceral pleura, of the mucous lining and other structures of the bronchial tubes, and of the connecting areolar tissue of the constituent parts of the lungs. We cannot avoid the conclusion that they are the nutrient vessels of the pulmonary cell walls also. These capillaries are unquestionably those involved in visceral pleuritis, and in bronchitis. It would seem to be an unavoidable conclusion, that they must also be the capillaries concerned when the inflammation is of the pulmonary cell walls, and of the areolar tissue that connects the cells to each other.

The capillaries of the pulmonary artery, on the other hand, convey venous blood to the air cells, to be distributed on their walls, in order that the physical process of endosmosis and exosmosis may take place between the gases of the blood and of the atmospheric air. It cannot be looked upon as probable that the blood in these capillaries takes any part in the vital processes of nutrition of the cell walls. It is, therefore, a just conclusion, that these capillaries and their blood cannot be agents in the altered state of nutrition of the pulmonary cell walls, and their connecting areolar tissue, which we designate by the term pneumonia. Though the capillaries of the pulmonary artery are not the inflamed capillaries, yet their deranged action has much to do with the pathology of pneumonia.

The phenomena which attend on the first inspiration after birth, on asphyxia, vesicular emphysema, and other pathological states of the lungs, teach us the following facts :—

1st.—That the pulmonary capillary circulation is contingent on the processes between the blood in the pulmonary capillaries and the air in the pulmonary air cells being in action.

2nd.—If this aeration of the blood is impeded from want of a sufficient air supply, or from thickening of the cell walls, or the cells becoming filled with liquid, or solid deposits, then the pulmonary capillary circulation on such cell walls becomes languid, and soon stops—the blood distends the vessels, and stagnates in them. Now additional blood is no longer sent into the

branches of the pulmonary artery, which conduct to these defective cells; it passes in excessive quantity into the adjoining branches, to be conveyed to the capillaries of the adjoining healthy cells, in order that it may be aerated there. If, however, the blood thus sent in excessive quantity to these adjoining healthy cells be greater than the extent of surface can readily aerate, then dyspnœa is caused. Short and hurried respirations merely express the fact that all the cells of the lungs are not admitting air, and that the diminished extent of surface thus arising is being compensated for by the greater frequency of the respiratory acts. Difficulty of breathing is only experienced when there is want of just relation between the quantity of blood in the vascular system and the extent of the effective pulmonary surface.

Let us now endeavour to apply these principles to the pathology of the disease before us.

When the pulmonary cell walls become somewhat thickened, from the turgescent state of the bronchial capillaries, and when secretions are present in the cells, in the degree which interferes with, but does not altogether prevent the admission of air, then we may believe that some degree of aeration is still carried on; the pulmonary capillaries become somewhat distended; the circulation of the blood in them is impeded, but is as yet not altogether obstructed. Such I believe to be the condition of the lung in the first stage of pneumonia. The inflammation continues; the thickening of the cell walls increases; the inflammatory deposits take place in greater abundance in the cells, and now the aeration of the blood at these cells becomes physically impracticable; the pulmonary capillaries become turgid with stagnated blood; the circulation in them has become altogether obstructed. Such I believe is the state of the lung in the second stage of pneumonia. Its spongy structure has become solid; the solidification depending, in part, it may be assumed, on inflammatory exudation into the cells, in part also, however, on the stagnated blood in the close-set meshes of the pulmonary capillaries. This latter condition of consolidation is not, I think, stated with sufficient prominence by pathological writers on this disease. It explains well how the consolidation of the lung sometimes takes place rapidly, and how, when it has occurred, it sometimes is very speedily removed. It is evident that if part of the consolidated condition of the lung has depended on pulmonary capillaries turgid with blood stagnated, but not coagulated, and aeration becomes re-established in the affected cells by reduction of the inflammation, then this stagnating blood will at once be set in motion, and the consolidation that depended upon it be speedily removed.

My belief, then, is, that the capillaries of the pulmonary artery are not the inflamed capillaries of pneumonia; but consequent on inflammation of the pulmonary cell walls, the action of the pulmonary capillaries becomes deranged in the manner explained. This derangement constitutes the danger of pneumonia, as of all other forms of pulmonary disease. Moreover, the deranged action of the pulmonary capillaries takes a part in producing the striking morbid appearance of the lung in pneumonia—I mean its hepatization.

In this view of the pathology of pneumonia, we have also a satisfactory explanation of the relation between hypostatic consolidation of the lung, and the hepatization of pneumonia. In hepatization, there is in the pulmonary capillary turgescence present, the condition of hypostatic consolidation; but there is also, in addition, the consolidating conditions derived from the direct products of inflammation.

Perhaps I have dwelt too long on these speculations;* yet, as we shall presently find, they have an important reference to symptoms, as well as to questions of treatment.

* I have never been able to understand why writers on the pathology of pneumonia have so seldom explicitly alluded to the question of which set of capillaries is engaged in the inflammation of pneumonia. Dr. Williams is the only writer who to my knowledge does so. In his article on pneumonia in the "Cyclopædia of Practical Medicine" he observes:—"These examinations, and some pathological considerations, induce us to consider the capillary ramifications of the pulmonary artery and veins to be the proper seat of pneumonia, and that these may involve more or less of the tissues through and around which they pass." This statement is not repeated, to my knowledge, in the subsequent writings of this author in the "Library of Medicine."

I now leave this digression, and return to my proper subject.

Rate of Mortality.—Let us consider the rate of mortality of these cases of pneumonia, marking the distinction between the primary and febrile forms.

There are 76 cases of primary pneumonia. Of these 24 died. If we exclude from calculation 2 cases fatal from cholera,* it leaves a mortality of nearly 29 per cent.

There are 27 cases of febrile pneumonia. Of these 8 died. In 2 of them the fatal result was caused more from co-existing meningitis than from pneumonia; yet, in estimating the rate of mortality of this form, we may not exclude any of the usual contingencies of malarious fever. The rate of mortality of the febrile cases is not quite 30 per cent.

The rate of mortality of primary pneumonia has been nearly as high as that of the febrile form. From this we are probably justified in assuming that pneumonic inflammation, when complicating malarious fever, is not so severe in character as when it occurs in its primary form. Were this not the case, the mortality of the febrile form would be higher, for we must attribute it in part to those other conditions of idiopathic fever which tend to cause death, and not exclusively to the pneumonia.

But 29 per cent. seems a large mortality from primary pneumonia. We have already found in the state of the constitution of a large proportion of the patients one condition favourable to high mortality from disease. Still it is very necessary, with the view of satisfactorily testing the efficacy or otherwise of the treatment followed in these cases, to inquire into the following points:—

1st.—The duration of illness before admission.

2nd.—The stage of the disease on admission.

3rd.—The extent and part of the lung affected.

4th.—The length of time under treatment before recovery or death.

5th.—The state of the lung on discharge in the cases discharged from hospital.

* In my subsequent statements regarding the rates of mortality, I shall not exclude these cholera cases.

Duration of Illness before Admission.—The subjoined tabular statement* exhibits the duration of illness of the patients before admission.

The mortality of the primary form admitted within five days from the commencement of illness was 5.5 per cent.: the single fatal case admitted in the second stage of the disease occurred in a Parsee of intemperate habits, and was complicated with pleuritic effusion and albuminous urine.

The mortality of the febrile form admitted within five days from the commencement of illness was 25 per cent.: the single fatal case occurred in an individual admitted with fever and bronchitis. Pneumonia came on subsequently, and proved fatal after seventeen days' residence in hospital.

The mortality of primary pneumonia admitted between six and ten days from the commencement of illness was 30 per cent. In 7 of the 8 fatal cases the disease was in the second stage on admission; in 4 the pneumonia was double: 3 of the double pneumonias were in the second stage, 1 in the first stage.

Of the 8 cases of febrile pneumonia, admitted between six and ten days from the commencement of illness, none proved fatal.

The mortality of both forms admitted above ten days from the commencement of illness was nearly 47 per cent.

When we regard all the admissions of primary pneumonia within ten days from the commencement of illness, the rate of

* *Duration of Illness of Patients before Admission.*

	Recovered.		Died.		Total.
	Primary.	Febrile.	Primary.	Febrile.	
1 to 5 days	17	3	1	1	22
6 to 10 "	18	8	8	..	34
11 to 15 "	6	6	4	2	18
16 to 20 "	5	..	1	3	9
21 to 30 "	2	2	2	2	8
31 and upwards	4	..	8	..	12
				Total..	103

mortality is found to be 20 per cent. But when we consider the febrile cases from the same point of view, the mortality is found to be only 8 per cent. Yet for the periods above ten days, the mortality of both forms is the same, 47 per cent.

The lower mortality of the admissions of febrile pneumonia, within ten days from the commencement of illness, is of interest. It seems to show that the pneumonia which complicates malarious fever does not make its appearance till some time after the commencement of the fever. It is, therefore, probable, that in all the cases of febrile pneumonia admitted within ten days from the commencement of illness the pneumonia will be found to be either in the first stage, or not long passed into the second stage.

Stage of the Disease.—Let us now inquire into the stage of the disease at which the admissions took place.

Of the primary form 8 were admitted in the first stage. Of these 2 died: in 1 the pneumonia was double, in the other it was complicated with much bronchitis, and occurred in a man of 60 years of age.

Sixty-four cases of primary pneumonia were admitted in the second stage. Of these 27 were double; 34 were single, and confined to part of a lung; 3 were of an entire lung. If we class together the cases of double pneumonia and those of an entire lung in the second stage, we find that the mortality was 36.6 per cent.; but the mortality of single pneumonia in the second stage, involving only part of a lung, has been 17·6 per cent.

The mortality of the aggregate admissions of primary pneumonia in the second stage has been 26·5 per cent.

Four admissions of primary pneumonia took place in the third stage: all were fatal.

Of the febrile form, 5 cases were admitted in the first stage: 1 proved fatal, admitted after twenty days from the commencement of the fever, complicated with muttering delirium and drowsiness.

Twenty-two of this form were admitted in the second stage. Of these 14 were double, 8 single. The mortality of the former was 35 per cent., of the latter 25 per cent.

Lung affected.—I shall now proceed to state the comparative frequency with which the disease has occurred in the lung of the different sides, and in the different parts of the lung. In this classification, the primary and febrile forms are considered together. Of both lungs (double pneumonia) there were 46 cases, with a mortality of 32·6 per cent.; of the right lung 39 cases, with a mortality of 33·3 per cent.; of the left lung there were 18 cases, with a mortality of 22·2 per cent. Of the cases in which the right lung was affected, the entire organ was involved in 3: this was not the case in any of the instances in which the disease was confined to the left side. Let us, therefore, deduct the 3 cases in which the entire right lung was engaged; this will reduce the mortality for this side to 25·3.

In judging of these rates of mortality, we must always bear in mind that they relate to a series of cases of which the admissions in the first stage are only about 13 per cent.

In this statement the proportion of the cases of double pneumonia is much greater than has usually been observed. This is in part owing to the two forms having been classed together: of the 27 cases of febrile pneumonia, we have the disease double in 17. When we consider the primary form alone, we find of double pneumonia 29; of the right lung 33; of the left lung 14. This is still an unusual proportion of instances of double pneumonia.

When we direct our attention to the part of the lung affected in these cases, it appears that in 79 the lower or middle parts, or both, were engaged, and of these the mortality was 26 per cent.

In 15 cases the upper lobe was affected, and of these the mortality was 26 per cent. In 9 the entire lung, double or single, was affected, and the rate of mortality was 77 per cent.

The greater liability of the lower part of the lung to become affected with pneumonia is well shown in these cases. The great mortality of the disease when an entire lung is involved also appears; but the opinion that pneumonia of the upper part of the lung is more fatal than that of the lower is not confirmed by these cases. It was the opinion of Louis, that individuals above the age of 50 were more liable to pneumonia of the upper

lobe than those of earlier periods of life. Eleven of the 15 cases of upper lobe pneumonia were under the age of 31.

Residence in Hospital.—In considering the duration of residence of the patients in hospital, let us separate the recovered from the fatal cases.

Of recovered cases, 12 primary and 2 febrile were discharged within ten days; 12 primary and 11 febrile between eleven and twenty days; 13 primary and 3 febrile between twenty-one and thirty days; 15 primary and 3 febrile above thirty-one days.

There were 57 cases discharged at different periods above ten days; 18 of them, indeed, above thirty-one days. From this statement we may infer, that though pneumonia in the second stage is frequently recovered from, yet a considerable time is very generally required to ensure the restoration of the lung to its healthy state.

Of the fatal cases, 14 primary and 5 febrile died within ten days from admission; 3 primary and 2 febrile between eleven and twenty days; 2 primary and 1 febrile between twenty-one and thirty days; 5 primary upwards of thirty-one days. The fact of 19 of the 32 fatal cases having proved fatal within ten days of admission shows the advanced stage at which a great proportion of them must have come under treatment. It confirms the direct statement made on this point in a former part of the report.

State of Lung on discharge.—Seventy-one cases were discharged from hospital. Let us enquire into the state in which the lung was at the time of discharge; and in doing so, separate the primary from the febrile form.

Of 51 cases of primary pneumonia the lung was quite* restored in 33, improved in 13, not improved in 5, and in 1 not recorded.

Of 19 febrile cases the lung was restored in 16, improved in 2, and in 1 not recorded.

When we class the two forms together, we find that 62 were admitted in the second stage, and only 9 in the first stage. It has appeared that in 49 of the discharged cases the lung was

* By this I mean that the removal of the dulness on percussion and return of the vesicular respiration indicated that the lung had become permeable, and fit for function.

restored. If we deduct from these the 9 cases admitted in the first stage, we have left out of 62 cases of pneumonia in the second stage 40 recovered, with restoration of the lung. Of the remaining 22 the lung was improved in 15, not improved in 5, and not recorded in 2.

Morbid Anatomy.—There was a post-mortem examination made in 15 of the 24 fatal cases of primary pneumonia, and in 7 of the 8 fatal cases of febrile pneumonia. It is not my intention to enter into any detailed consideration of the morbid appearance observed in these 22 cases. I shall merely notice those points which seem to me to be of interest.

In 11 of the cases the solidified lung was found in a state of induration, either red or grey: this condition, compared with readily lacerable hepatization, occurs in this hospital in a greater proportion even than this series shows. It will be found to be related to asthenic states of the system, to the disease running a slower course, and not unfrequently to advanced period of life. True hepatization, on the other hand, will be found to have occurred in better states of the constitution, and in instances in which the fatal issue has taken place sooner: in the febrile form it exists in greater proportion than induration. Of the 7 cases of febrile pneumonia there was hepatization in 5, and induration in 2; whereas in the 15 cases of primary pneumonia there was induration in 9, and hepatization in 6. The question of whether the grey induration is to be regarded as an advanced stage of the red or brown, or a distinct variety from the commencement, has been discussed at different times. These cases, I think, rather countenance the former view of the pathology of this change. Tubercular deposit was observed in only 1 case—a febrile one: it was in small quantity in the upper lobe of the left lung.

In 3 of the cases—2 primary, and 1 febrile—the hepatization, in places, occurred in nodules: the pneumonia had been in part lobular; but in all there were also hepatized portions of considerable extent. There was no reason for supposing that these cases of lobular pneumonia were dependent on pyœmia. They were more probably instances in which bronchitis had passed into pneumonia. In all of them increased redness of the bronchial mucous lining was well marked.

Though there are no cases of pyœmic pulmonary abscesses in this series, yet several have been observed in the hospital. Mr. S. Carvalho very lately called the attention of the Grant College Medical Society to this important subject. The interesting paper which he presented detailed the history of the cases of pyœmia which had come under his observation.

Pleuritic adhesions have very generally been found, marking the co-existence of pleuritis, more or less recent. The absence of pleuritis will, I believe, be found to occur more frequently in febrile than in primary pneumonia: of the 7 fatal cases of the former, examined after death, it is distinctly stated that in 2 of them there were no traces of pleuritis, and yet in both there was much red hepatization of the lung.

Thick cacoplastic membranous, almost cartilaginous, deposits were found in 1 or 2 cases, connecting the surfaces of the pulmonary and costal pleura together. One case seemed to show that the deposit takes place in the first instance on the surface of the pulmonary pleura, and advances to some degree of thickness, before it forms adhesion with the opposed costal pleura. In the case referred to, the anterior part of the upper lobe of the right lung adhered to the costal pleura by a thick membranous, almost cartilaginous, layer; while on the same part of the left lung there was an opaque membranous deposit, but no adhesion.

Bronchitis, to greater or less extent, has also been noticed as a frequent complication of these cases of pneumonia. It occurs, I believe, in greater proportion in the febrile form of the disease.

Cavities were found in the lungs in 5* cases. They ranged in size from a small orange to a split pea. In all there were several cavities. They existed both in the upper and lower lobes. They all occurred in the midst of grey induration. In 1 the different stages of the process were well seen: in it, here and

* There was a sixth case, in which cavernous respiration was present, but the body was not examined after death.

there in the grey induration, there were dark red points, from the size of a pin's head to that of a hemp seed; and there were also cavities from the size of a split pea to that of a pigeon's egg, with an inner surface, moist, and of dark-red colour. I believe that in this case, in the grey indurated part, there took place here and there a stasis of blood, probably of the nature of inflammation, followed by molecular loss of vitality, whence softening, liquifaction, and the formation of cavities at these points. This seemed to me to be the process by which in 2 of these cases the cavities had been formed. In the 3 others the appearance of the walls of the cavity, the fœtor of their contents, or of the sputa during life, indicated that the loss of vitality had not been molecular merely, but of portions of the structure more or less large: that the cavities had been formed by a process of gangrene.

In none of these 5 cases in which cavities were found was there anything resembling tubercular deposit observed in the lungs.

We found in many of these cases what may very generally be noted when there is solidification of a considerable part of a lung: I mean a more or less emphysematous or inflated state of those parts of the lung that remain crepitating.

Bright's disease of the kidney was present in only 3 of the cases: in 2 of these there was red hepatization, lobular in character in 1; in the third case there was grey induration, with cavities. On reference to the "Notes on Bright's Disease," published by me in the Society's Transactions, it will be found that pneumonia was present as a secondary affection in only 1 instance. Thus, then, as yet the observations made in this hospital do not show any great relation between pneumonia and Bright's disease: they are, however, not to be looked upon as in any respect conclusive on this point; they have not been made with sufficient care and attention, and frequency.

Nor have my observations in this hospital as yet confirmed the frequent relation between heart disease and pneumonia. Disease of the heart was not present in any of the cases in this series; and pneumonia was found in 2 of the 16 fatal cases of heart disease examined after death, and included in my notes on these affections published in the last number of the Society's Transactions.

In 1 case there had been circumscribed empyema of the right side: perforation of the under part of the middle lobe of the lung at its fissure with the 3rd lobe had taken place. This part of the middle lobe had formed the vault of the sac. The purulent effusion had also opened into the pericardium, and excited pericarditis. In the left lung in this case there was grey induration, and cavities by softening.

The complication of pleuritic effusion, serous or puriform, has been observed in only 2 of the fatal cases. One, just adverted to, was circumscribed empyema and primary pneumonia. The other was febrile: the effusion was of red tinged serum. These results, however, by no means express the frequency with which this complication takes place. It was present in 5 of the recovered cases of this series, 4 primary, and 1 febrile; and I have met with it in several other cases at different times. The defect of vocal thrill, the appearance of a friction murmur as the dulness on percussion lessens, the presence of crepitus at some period or other, and of sputa more or less copious, have been the signs on which the diagnosis of this complication has been determined. On the whole, my impression coincides with that which I believe generally exists relative to the combination of pneumonia, and some degree of pleuritic effusion,—that the prognosis is more favourable in the combined than in the separate affections. We must believe that they commence simultaneously, and may suppose that they mutually influence each other: the solidification of the lung limits the amount of the pleuritic effusion—the pleuritic effusion limits the degree of the solidification of the lung. The advance of the morbid change in both is thus checked, and there is a more ready tendency to a restoration to health.

Symptoms.

I shall consider the symptoms, as they have presented themselves in these cases of pneumonia, under the following heads:—1*st*, Fever; 2*nd*, Pain; 3*rd*, Dyspnœa; 4*th*, Cough; 5*th*, Delirium; 6*th*, the Character of the Sputa; 7*th*, the Physical Signs.

Fever, not hectic in character, was observed in 92 cases—in all of the febrile form, and in 65 of the primary.

The remittent* character of the fever was well marked in all the cases of the febrile form. It was also distinctly observed in a considerable proportion of the cases of pneumonia which have been classed as primary. The remittent character of symptomatic fever is of frequent occurrence, both in the medical and surgical practice of this hospital. To what extent it presents itself as a feature of symptomatic febrile disturbance in the Natives of India generally, I am unable to say. I believe that there is a relation between the frequency of its occurrence and asthenic states of the system. It is of practical importance to watch for it, as I shall explain when we come to the consideration of the treatment of pneumonia. This remittent type of symptomatic fever may be explained on the supposition that the influence of malaria pre-existed in the constitution, and that on the excitement of febrile phenomena from local inflammation, they assumed the remittent form, just as a person previously influenced by malaria may have intermittent fever excited by exposure to cold. The inflammation is the exciting cause of the fever: the state of constitution previously engendered by the influence of malaria determines the type which that fever assumes. This view of the remittent character frequently presented by symptomatic fever will receive confirmation from the observations to be made under the head of treatment. But whatever the true explanation may be, the fact is undoubted, that of the asthenic Natives of Bombay affected with pneumonia, the symptomatic fever is in many instances markedly remittent in type. So much so, indeed, that it is frequently a difficult question of diagnosis to determine whether the particular instance ought to be classed as primary or febrile pneumonia.

In determining this diagnosis, the following considerations have chiefly influenced me, in respect to the febrile form :—

1st.—The distinctness of the exacerbation and remission.

2nd.—The history, showing clearly that the febrile symptoms had taken precedence by some days of the symptoms of pneumonia.

* I do not think it necesssry to separate the 4 cases in which the fever was intermittent in type.

3rd.—The state of the tongue, as regards fur, floridity, dryness.

4th.—The presence of much restlessness at night, with some degree of delirium when the pneumonia is not far advanced.

5th.—The fever presenting typhoid phenomena. This is, however, an occurrence only of the advanced stages : it was observed in 5 of the cases of this series.

Attention to these circumstances will in general serve for the satisfactory establishment of this diagnosis. Yet, with patients admitted in the advanced stages of disease, with imperfect histories of their previous illness, difficulty will be occasionally experienced.

When the pneumonia has existed for some time in the second stage, then, very generally, the cessation of the febrile phenomena takes precedence for a time—longer or shorter, according to the previous duration of the disease—of the restoration of the lung to its healthy state. The cessation of the fever, when not replaced by that of hectic type, is generally attended by improvement of the other symptoms also, as by lessening of the cough and dyspnœa. It is, however, to the physical signs that we must turn our attention for information regarding the real condition of the lung. In many cases, nearly all of the febrile form, and in a considerable proportion of the primary form, it will be found that the cessation of the fever, and lessening of the cough and dyspnœa, are attended by a corresponding improvement of the physical signs: the dulness becomes less; the bronchial respiration is more distinct, and is gradually replaced by the vesicular; the crepitus redux is sometimes heard; and in a time more or less rapid the signs of complete restoration are present. In other cases of the primary form, however, in which the lung has been for a longer time consolidated, we find that days may pass before the improvement in the general symptoms is followed by signs of the decrease of the consolidation. Then these signs begin to appear, and by a slow process the lung is more or less completely restored. Now it is reasonable to assume, that though in these latter cases the process of restoration is so slow as to require some time before, by a lessening of the signs of consolidation, it gives evidence of its being in progress, yet its commencement or its tendency to commence, is coincident with the cessation of the fever, and the improvement in the other symptoms. These facts have an important bearing on treatment, as I shall presently endeavour to show.

Hectic Fever was noted in 8 cases: they were all of the primary form. Five of them were the cases in which cavities existed, and which proved fatal. Three of them were discharged cases; 2 with the lung somewhat improved; 1 with no change.

Pain.—When we inquire into the frequency with which pain in some part of the chest was complained of, we find that it was present in only 40 of the cases: 34 of these were primary, rather more than a half of this form; 5 were febrile, a little less than a sixth of this form.

The less complaint of pain in the febrile form accords with the results noted under the head morbid anatomy. There it is stated, that pleuritis is more frequently absent in the febrile than in the primary form.

Pain below the Margin of the Right False Ribs was noticed in 13 cases: they were all of the primary form. In 3 there was pain also at the margin of the left ribs. In 6 of the cases in which there was pain below the margin of the right ribs, there was also some degree of abnormal dulness there on percussion.

In only 1 of these 13 cases (a fatal one) was there reason for connecting this pain with the existence of hepatic inflammation. In this single case abscess was found in the liver after death. In my "Notes on Disease of the Heart" it is stated that in 6 of the 21 cases there existed pain and some degree of abnormal dulness at the margin of the right ribs. This was attributed to congestion of the liver, consequent on the obstructed passage of the blood through the heart. That congestion of the liver is apt to occur consequent on obstruction to the passage of the blood through the lungs in extensive pneumonia, is an old observation of pathologists. That it is correct, I believe, from having witnessed a congested state of the liver after death in several cases of pneumonia.

When pain below the margin of the right ribs is present in pneumonia, associated with abnormal dulness, we shall generally

be right in relating it to hepatic congestion. The pneumonia may be either of the right or the left side, but the hepatic congestion indicates, I believe, that it is extensive.

There are, however, other cases in which pain is experienced at the margin of the right ribs, but unattended with abnormal dulness there. In these the pain is probably sympathetic, like that not unfrequently observed at the margin of the left ribs in pericarditis. When the pneumonia is of the right lung, we shall have this kind of pain, if present, at the margin of the right ribs; if the pneumonia be of the left lung, the pain will be at the margin of the left ribs. But we may expect to find it more frequently on the right side, because pneumonia of the right lung is more common than that of the left. This sympathetic pain was noticed in 7 cases of our series: but my remarks are not grounded on these cases alone—the symptom has been noticed by myself and others in other cases in the general wards of the hospital.

The occurrence of hepatitis secondary on pneumonia no doubt occasionally takes place; therefore, when pain is felt at the margin of the right ribs, the fact must be borne in mind. Still, these cases would seem to justify the opinion that the co-existence* of these diseases is not common. It was observed in 1 only of 103 cases of pneumonia, and that in a case in which it was unlikely to occur, for the pneumonia was of the upper part of the left lung. But pain at the margin of the right ribs unconnected with hepatitis has been observed in 12 of the 103 cases.

I have called attention to this symptom† for the same reason that I did so in connection with heart disease—that an error in diagnosis may not be committed, and pneumonia be mistaken for hepatitis. This I have known to occur; therefore I am satisfied that the caution is not uncalled for.

* It must be understood that I speak of hepatitis secondary on pneumonia: pneumonia secondary on hepatitis is more common. I do not now allude to the co-existence of these diseases taking place in this latter order, but only in the former.

† It is hardly necessary to caution against the error of mistaking uneasiness at the margin of the right ribs, with dulness, consequent on displacement of the liver from pleuritic effusion, for the conditions to which reference has been made in these remarks.

Dyspnœa.—We now inquire into the manner in which the function of the lungs has shown itself to be impaired in these cases. Some degree of shortness and hurry of the respiratory acts was noticed in 91 cases: of these 67 were primary, and 24 were febrile; leaving 9 of the first and 3 of the second in which this symptom was not noted.

Though some degree of dyspnœa has been noticed in so many instances, yet in the great proportion of them it was by no means urgent, and in many might have been overlooked, had not the cases, from the circumstance of their being collected together for purposes of clinical instruction, been submitted to careful observation and record. The reason why the dyspnœa was slight, and might readily have escaped notice in many of these cases, is sufficiently explained by the circumstance of the asthenic state of the constitution of so many of the inmates of this hospital.

The degree of dyspnœa present must always be looked upon as an expression of the degree in which there is disproportion between the amount of blood to be aerated, and the extent of the pulmonary aerating surface.

In an individual of sthenic constitution, in whom the blood is abundant, and the full extent of the pulmonary surface is required for its aeration, pneumonia of a small extent of lung is attended with marked dyspnœa; but when the quantity of blood has been for some time reduced, as it always has been in asthenic states, then the full extent of the pulmonary surface is in excess of what is required; part of it may become unfitted for its function by pneumonia, and yet dyspnœa be hardly noticeable. In these statements we have the explanation of the latency or obscurity of the symptoms of impaired function of the lungs in asthenic pneumonia.

When we come to allude to the treatment of the sthenic forms of the disease, we shall find that it is of importance to bear in recollection that dyspnœa is the expression of want of proportion between the quantity of the blood and the aerating surface; and that we may lessen it, or remove it in one of two ways—either by restoring the pulmonary surface to its

structural fitness, or reducing the blood till it is in proportion to the diminished extent of that surface.

In some cursory notes on the thoracic inflammations in the European General Hospital, presented to the Society in May 1845, and published in No. VI. of the "Transactions," the following remarks are made:—"Pneumonia is certainly a disease of infrequent occurrence in Bombay; but it may not be altogether misplaced to remark here, that partial and circumscribed pneumonia is by no means a rare complication of the fevers to which Natives are liable in the cold season in the Deccan, and I believe in Guzerat. If the febrile symptoms persist without intermission for two or three days; if the skin be dry; the tongue not furred to the extent that might be expected, were the digestive organs much deranged; then a careful stethoscopic examination will probably detect the existence of a crepitous rale in some part or other of the chest—most frequently in the neighbourhood of the mammary region; and this may be when there has been no complaint of pain, no cough, and attention has not been called to any difficulty of respiration. In these cases, attentive observation will detect an altered expression of countenance, not amounting to anxiety, but which clearly marks the probable implication of some important organ. The person feels ill, but seems unable to explain to another the nature of his feelings; the body is inclined forwards, the lips are dry and parted, the respiration is somewhat hurried, but often not more so than a general and uncomplicated febrile condition might explain. The stethoscope will resolve the doubt, and the free use of tartar emetic, combined with blood-letting, general or local, and blisters, according to circumstances, will, if the disease has not been allowed to go too far, effect a cure, and prove the accuracy of the diagnosis." These remarks were grounded on what I had seen of the diseases of Natives in former periods of my service in the Deccan, and on the Mahableshwur Hills. My experience since in the Jamsetjee Jejeebhoy Hospital has corrected my error in regard to the infrequency of pneumonia in Bombay; but my chief object in reverting now to what I had previously written is, that I may have the opportunity of observing, that though there is nothing in my experience since at variance with the general tenor of these remarks on the obscurity and importance of febrile pneumonia, yet we ought not to lay much stress on general symptoms such as those I have detailed. In treating the malarious fevers of the Natives of India, percussion and auscultation of the chest should be invariably practised with daily regularity. It is a practical rule, quite as important in the management of this class of diseases as the search for the signs of pericarditis and endocarditis is in the course of acute rheumatism. He is a careless practitioner who allows himself to be taken by surprise by the discovery of pneumonia in remittent fever, or pericarditis in acute rheumatism.

Cough was present in 98 cases, 72 primary and 26 febrile.

The little urgency of the cough in pneumonia has been very generally noticed by writers on this disease. The opinions which I have ventured to express on the general pathology of pneumonia seem to me to afford a ready explanation of this peculiarity. Cough merely expresses the fact that there exists in the bronchial tubes some obstacle to the free transmission of air to the cells beyond: it is a forcible expiratory act, called into play to remove the cause of the obstruction. It is reasonable to suppose, that if the air cells beyond become unfit for aeration, and the venous blood be no longer sent to them, but, instead, to the healthy adjacent cells,—then any obstruction existing in the tubes leading to the impervious cells is no longer the same evil as when the cells were efficient, and blood was sent to them for aeration: hence there is no longer the same demand for cough to clear them. The solidified lung in pneumonia is in the state just described, and such seems to me the best explanation of the little urgency of the cough in that disease.

Delirium was observed in 11 cases. This symptom, when occurring in primary pneumonia, does so in the advanced stages. It is of very unfavourable import. It was observed in three cases of the primary form: they were all fatal, one with pneumonia of the upper part of the left lung in the third stage, with cavities; the other two were double pneumonia, in the second stage.

The remaining 8 cases of the series in which delirium, generally associated with some degree of drowsiness, was noted, were of the febrile form: in 4 there was recovery; in 4 death. Therefore this symptom, more particularly when occurring early in the disease, and when not attended with typhoid phenomena, is not of the same unfavourable omen in febrile as in primary pneumonia.

The Character of the Sputa.—The rusty adhesive sputa characteristic of pneumonia were noted in only 17 cases—12 primary and 5 febrile; of these 14 were recoveries, and 3 proved fatal. In the other cases the sputa were untinged, mucous, and more or less adhesive; in a few cases none are recorded. In 7 cases red muco-puriform sputa are stated to have been present: they were all of the primary form. Four proved fatal, and in all of them there existed cavities in the lungs; in 2 verified by post-mortem examination; in 2 not examined after death, but the cavities were believed to have been present, in consequence of cavernous respiration having been recognised during life. In 3 the patients were discharged: they were cases in which hectic had been present; in 1 there was no improvement of the lung; in 2 some degree of improvement had taken place. In none of the 3 were cavities suspected to exist.

From these cases, then, and from another to which I shall presently advert, the appearance of this character of sputa does not necessarily indicate the existence of cavities in the lungs.

In my "Notes on Hepatitis," as observed by me in the European General Hospital, presented to the Society in May 1845, and published in No. VI. of the Society's "Transactions," I find the following remark relative to the opening of hepatic abscess into the lung:—"This expectoration of brick-red puriform fluid I am disposed to consider as pathognomonic of abscess in the liver opening into the lungs, because there is not any disease of the lungs in which we can conceive as a result the co-existence of pus intimately intermixed with blood—the one, pus, being the result of an advanced stage of inflammatory action, the other, blood, the result of an early stage of the same action; but when we suppose that the pus comes from the liver, and the blood from the lung irritated by the foreign body, the co-existence is sufficiently intelligible."

Dr. Budd, in his "Treatise on Diseases of the Liver," published in June 1845, writing of the opening of hepatic abscess into the lung, thus expresses himself:—"When this happens, it is marked by very characteristic symptoms, by a new train of stethoscopic phenomena, which it is perhaps unnecessary to detail, and by the sudden expectoration of a dirty red or brownish puriform matter. The peculiar colour of this matter, which has been already noticed, arises from the pus in its passage through the lung becoming mixed with blood and broken down pulmonary tissue. There is no matter like it expectorated in any disease of the lung itself, and I believe that its appearing is pathognomic of abscess of the liver, or at least of abscess perforating the lung. I observed it in several instances in the Dreadnought, and more than once was led by it to detect an abscess in the liver, of which I had previously no suspicion."*

Here, then, are two observers, remote from each other, unacquainted with each other's researches, making at the same time, and very nearly in the same words, the same observation relative to a symptom of disease; yet both were certainly in error, as regarded the exclusive light in which they viewed the symptom.

The kind of sputa of which I am now writing under the designation of red tinged muco-puriform sputa, observed in states of asthenic pneumonia, is not to be distinguished from that which I formerly considered to be pathognomonic of hepatic abscess having opened into the lung. Confiding in my former observations, I, in more instances than one, committed an error in diagnosis, after my transference from the European to the Native General Hospital brought me for the first time into practical acquaintance with asthenic forms of pneumonia.

The diagnosis, when undue importance is not attached to this character of the sputum, may no doubt in the majority of cases be satisfactorily made out; but yet not in all, as the following cases will serve to illustrate:—

* 1st edition, page 88.

Dhoondee Pelajee, a Hindoo mason, 50 years of age, was after twenty days' illness admitted into hospital, on the 24th January 1846, affected with fever, anxiety, dyspnœa, and pain across the lower and anterior part of the chest. There were bronchitic rales, with crepitus and bronchial respiration in the posterior part of the right side of the chest. The disease was considered to be pneumonia. But on the 26th the pain extended from the right nipple to two inches beyond the margin of the right ribs; and there was dulness on percussion throughout this extent; the sputa were of brick-red colour, and in detached masses. The opinion was then entertained that there was abscess of the liver, which had opened into the lung, and that the pneumonia was secondary. He died on the 30th January. The liver extended an inch beyond the margin of the ribs; it had formed slight adhesions with the diaphragm, was congested with blood, but without abscess or other disease of structure. The right lung adhered to the diaphragm and the ribs by tender adhesions; the lower lobe was in a state of red induration.

Allawoodeen, a Mussulman weaver, 37 years of age, was admitted into the clinical ward on the 27th December 1850. He had been ill four months. He was emaciated; his respiration was short and hurried; there was dulness, with some slight bulging of the lower part of the right side of the chest. There was defectiveness there of vocal thrill, and absence of sound under the stethoscope. There was tenderness below the margin of the right ribs; he had constant troublesome short cough, and expectorated red tinged opaque mucus; he suffered from hectic. The illness had commenced with pain of the right side of chest and margin of the ribs, four months before admission; the cough and expectoration had existed for six weeks. The sputa became muco-puriform, and tinged red. About a month after admission there were signs of a cavity at the lower angle of the right scapula, and dysenteric symptoms came on. He was removed from the hospital in a moribund state.

This case was entered pneumonia in the hospital returns. I have excluded it from the present series, because I am very doubtful of the accuracy of the diagnosis that was then formed: I believe now that hepatic abscess had opened into the lung.

I would hardly have ventured to engage at such length in what may appear to be a mere correction of an error previously committed by myself; but Dr. Budd has, it seems to me, committed a similar error. His work is extensively known, and deservedly of high authority in diseases of the liver. I have felt, moreover, that the circumstances just detailed have an application beyond their immediate subject: they serve to inculcate the lesson of caution, and to impress upon our minds the liability to error in clinical research.

Physical Signs.—It is unnecessary that I should take up the time of the Society with a subject now so well understood as the physical signs of pneumonia. The statement of the stage of the disease on admission, and the state of the lung on discharge, rests on these signs. On this point I would merely observe, that abnormal dulness on percussion, bronchial respiration, with some degree of crepitus in the adjacent parts, and presence of the vocal thrill, were the signs held to indicate the presence of the second stage; while disappearance of the abnormal dulness, and replacement of the bronchial by vesicular respiration, even though the latter has continued somewhat feebler than on the sound side, have been held to signify that the lung had become restored to functional fitness.

There is one caution which it may be useful to make. The frequency with which enlargement of the spleen is met with, makes it necessary that we should be careful not to mistake the abnormal dulness of the left dorsal region, caused by it, for the dulness of hepatization of the lung.

Treatment.

Venesection was held to be expedient in only 3 of the 103 cases of pneumonia included in this report, and even in these it was adopted to a very limited extent. This fact shows clearly enough the general character of the constitution of the persons affected, and the stage of the disease at which they usually came

under treatment. It is not to be explained on the supposition that I entertain peculiar views in regard to the unsuitableness of general blood-letting in the treatment of inflammatory diseases. I entirely agree with those who think that a pulse above the natural frequency, full and firm, associated with increased heat of skin, and co-existing with inflammation of an important organ, indicates the propriety of general blood-letting. But we, at the same time, cannot impress too firmly on our minds, that these are conditions of the pulse which co-exist only with the early stages of inflammation in individuals of sthenic constitution. Whilst thus, then, expressing my belief in the efficacy of general blood-letting in appropriate circumstances, in the treatment of inflammatory diseases, I am unable to concur in those views which regard it as a remedy *peculiarly* appropriate in pneumonia. The opinion that blood-letting may be carried to a greater extent in pneumonia than in other inflammations, rests, it may be supposed, on the observation of the great relief to the dyspnœa which generally follows the loss of blood; and on the inference that this relief may be received as proof that there has been a corresponding improvement in the inflamed lung. Such an inference, however, is surely erroneous. Dyspnœa, as already explained, depends on a want of just proportion between the quantity of blood in the vascular system, and the extent of the pulmonary aerating surface. In pneumonia the extent of that surface is lessened; more blood is sent to the healthy part of the lung; dyspnœa results. By reducing, by venesection or other means, the amount of blood circulating in the system, we necessarily relieve the dyspnœa. But this may have been effected without any improvement having taken place in the state of the inflamed part. Indeed, it is distinctly stated by Dr. Alison,* as a result of his clinical observation, that auscultation may indicate a continuance, and even extension, of the disease, for a considerable time after the breathing has been effectually relieved by blood-letting. Let us admit, then, that blood-letting in pneumonia may afford relief on two distinct principles, one common to it with other inflammations, the other peculiar to itself,

* Outlines of Pathology, p. 281.

and related to the function of the organ. But it by no means follows that the rules for its use in any respect differ from those which obtain in inflammation generally. Blood-letting, within certain limits, is a valuable therapeutic means in certain states and stages of inflammation. Carry it beyond these limits—use it in other states and stages of inflammations—and it becomes injurious. This is equally true of pneumonia as of other inflammations. When the circumstances, as indicated by state of pulse and skin, and stage of disease, are inappropriate, we may not use blood-letting in pneumonia merely to relieve dyspnœa. This would be a mere palliation of a symptom, purchased by increasing the tendency to death in another way. It would be as if in idiopathic fever, complicated with diarrhœa and stupor, we were to give full opiates, and check the former, with the certainty of increasing the tendency to death by coma.

The statement made, with the view of inculcating free blood-letting, by Andral,* and repeated by Dr. Watson,† that this remedy is useful in pneumonia, on the principle applicable to all inflammations, and also on the principle in accordance with which the exclusion of light is useful in opthalmia, and rest in an inflamed joint, is, I apprehend, in its latter part, of very doubtful accuracy. If the opinions which I have ventured to express in a former part of this paper be at all correct, viz. that after the affected pulmonary cells have, for a time, been the seat of inflammation, they become unfit for function, they no longer exercise it; then blood-letting can do no good to them, by relieving them from function, as the exclusion of light and rest do to the inflamed eye and joint. It does good to the *healthy* cells, by relieving them of that excess of function which they have been required to assume. But the only way in which the loss of blood can be of use to the *affected* cells is by lessening the inflammation, in the way in which other inflammations are lessened by the same means. The benefit thus gained is improved on, not by the *repose* of these cells, but by

* Clinique Medicale, vol. ii., page 378.

† Lectures on the Principles and Practice of Physic, vol. ii., page 91, 3rd edition.

the *resumption of function* on their part setting the blood in their pulmonary capillaries again in motion.

Local Blood-letting.—Though there has been more scope for the use of local than general blood-letting in these cases, yet the application of this means has also been limited in degree: not so much as regards the numbers in whose cases it was had recourse to, as the extent to which it was considered expedient to carry it.

In 21 of the cases cupping was used; in 36, leeches were applied. We have, then, an aggregate of 57 cases in which local blood-letting was practised: of these, 46 recovered.

The total admissions within the fifth day from the commencement of illness were 22. Of these 20 recovered: in all of them local blood-letting formed part of the treatment.

Between the sixth and tenth days there were 34 admissions. Of these, 26 recovered: local blood-letting was used in 18 of them.

But if we confine our attention to primary pneumonia, this latter statement gives too favourable an estimate of the success of treatment; for of the 26 recoveries between the sixth and tenth days, 8 were of febrile pneumonia; and I have already observed, that though the fever was of that duration on admission, the pneumonia was probably of more recent origin.

From this statement, then, we are justified in concluding that when pneumonia is seen within five days, or a little over it, that even in the classes to which the inmates of this hospital belong, local blood-letting to some extent is an appropriate remedy, and, when so, an undoubtedly efficacious one.

Of the 46 recovered cases in which local blood-letting was used, there remain 8 admitted above the tenth day of illness.

Of the 11 fatal cases in which there had been local blood-letting, there were 3 admitted between the sixth and tenth days, and 8 above the tenth day, from the commencement of illness.

It appears, that of 47 cases of pneumonia admitted after the tenth day, local blood-letting was had recourse to in only 16. Of these 47 cases, 25 recovered, and local blood-letting had been used in 8 of them. We find, then, that for pneumonia admitted after the tenth day, the scope for local blood-letting is very limited; for even in those for whom at the time it seemed admissible, there were as many deaths as recoveries.

The principles which have been observed in directing local blood-letting have simply been the symptoms and signs of pneumonia being present with that condition of pulse and skin which on general therapeutic principles justifies the use of this means.

To those who by clinical experience have yet to become familiar with the varying conditions of the pulse and their indications, it may be said that in the Natives of India generally, we are not likely to meet with the state of pulse and skin which indicates local blood-letting, co-existing with a primary pneumonia of upwards of ten days' duration.

Tartar Emetic.—We have found that in these cases there was little opportunity of practising general blood-letting. There has been also, and for the same reasons, little opportunity of giving tartar emetic in free doses. I am, however, from former experience, perfectly sensible of its efficacy in suitable cases.

This remedy, however, has been used to some extent,* in 66 of our cases: of these, 49 were recoveries, and 17 fatal.

Of the recoveries 33 were admitted under 10 days' illness, and in 24 of these local blood-letting had also been used. Sixteen were admitted above ten days' illness: in 5 of these tartar emetic was given alone, in 11 it was combined with quinine.

We may infer, then, from these statements, that in many of the recovered cases for which local blood-letting was considered appropriate, the moderate use of tartar emetic was held to be so also, and that it assisted the cure; that in some in which local blood-letting was had recourse to, tartar emetic was omitted, either in consequence of co-existing gastro-enteritic irritation, or from the treatment with mercury having been preferred. Further, that in some cases for which local blood-letting was not considered appropriate, tartar emetic was used, generally in combination with quinine, on a principle to be subsequently explained.

* From a sixth to half a grain every second, third, or fourth hour.

The principles which have been applied to local blood-letting, may be also to this moderate use of tartar emetic, viz. that those states of pulse and skin, and symptoms that indicate the propriety of local blood-letting justify the use of tartar emetic, provided it be not contra-indicated by the presence of an irritable state of the gastro-intestinal lining. But we may probably go further than this, and say, that if we are careful to guard against the tartar emetic causing increased evacuations from the bowels, we may use it in instances of pneumonia with febrile disturbance, in which the small volume and compressibility of the pulse are such as to contra-indicate local blood-letting or other evacuations. We may do so because, by this cautious use of tartar emetic, we are not adding directly to the asthenia; and if by its use we can in any respect lessen the degree of febrile disturbance we certainly lessen the influence of a state which tends rapidly to induce asthenia.

Mercury, Calomel, and Opium, were given with the view of inducing mercurial influence in 21 cases. Of these, 20 were of the primary form, and to them the following statements are confined.

Fourteen were recoveries; 6 proved fatal: mercurial influence was induced in 11 of the recovered cases, and in 2 of the fatal ones. In the remaining 7 it was necessary to omit the remedy, from some cause or other adverse to its continuance. The cases in which mercury was used were in the second stage of the disease. In the 14 recovered cases, 7 were admitted within five days from the commencement of illness, 5 between the sixth and tenth days, and 2 after the tenth day.

Of the 11 recovered cases in which mercurial influence was induced, there was in 7 complete restoration of the lung; but in 4 only improvement. Of the 7 restored cases, 4 were admitted within five days, and 3 between the sixth and tenth days. Of the 4 improved cases, 2 were admitted within five days, and 2 above that period.

Let us now take 8 of the cases in which mercury was used, and regard them from another point of view. In 3 the commencement of improvement in the lung was coincident with the tenderness and swelling of the gums; in 3 the improvement of the lung distinctly took precedence of the usual indications of mercurial influence; in 2 there was no improvement in the lung consequent on the mercurial influence.

Let us now follow the 6 fatal cases in which mercury was given. The 2 in which the mercurial influence was induced had been ill upwards of twenty days before admission: in 1, dysenteric symptoms and hectic fever came on; in the other, after mercurial influence had been evolved, hepatitis ending in abscess took place. Of the 4 other fatal cases in which it was necessary to intermit the mercury, 3 were admitted between the sixth and tenth days, and 1 within five days.

Let us now address ourselves to the question of whether this series of cases is favourable to the mercurial treatment of pneumonia.

Of the 71 cases discharged from hospital, the lung was restored in 49, and improved in 15. Of the restored cases, 7 were brought under the influence of mercury, and 42 were cured without it; and of thém 37 had been admitted in the second stage. Of the improved cases, in 11 the improvement was effected without mercury: they were all in the second stage.

It may, however, be objected to this statement, that the febrile cases have been included, while, with one exception, the mercury was only used in the primary form.

Let us exclude, therefore, from the discharged cases admitted in the second stage, those that were of the febrile form; and we have left of restored primary cases 25, with 18 of them cured without mercury; and of improved cases 13, with 9 of them improved without mercury. Further, let us recollect that of the 7 cured cases in which mercurial influence was induced, in 3 the improvement in the lung commenced before the usual evidence of mercurial influence was present: it may, therefore, be argued, that the improvement was independent of the remedy.*

* This argument has been generally used, but I do not admit its force. There is nothing unreasonable in assuming that the mercury may have influence on the blood and the diseased action before it has proceeded to the degree of causing tender and swollen gums.

From a careful consideration of these facts, we must acknowledge that in these cases we find little evidence of the therapeutic value of mercury in the treatment of pneumonia. But because we have little evidence in this report of the advantage of mercurial influence in the treatment of pneumonia, it by no means follows that it is not an expedient and useful means, under some circumstances of the disease. These cases have borne no testimony to the efficacy of general blood-letting, or the free use of tartar emetic, but their utility in suitable cases has not on this account been called in question; nor may we doubt the advantages to be derived from mercury when the circumstances are appropriate for its use. It is most important that we should endeavour to determine what these circumstances of pneumonia are for which the mercurial influence holds out the prospect of good, in order that we may have recourse to it only in these, and abstain from it in those for which it is unsuitable and injurious.

For the treatment of sthenic pneumonia in its first stage, or as it begins to pass into the second, general blood-letting and the free use of tartar emetic are, I apprehend, the appropriate remedies, because we are almost certain under these circumstances of finding present the full and firm pulse, and increased heat of skin, which indicate the propriety of the adoption of these means. But when the disease has gone on, and passed into the second stage, or come under treatment at this period, then, in addition to that degree of local blood-letting and tartar emetic indicated by the state of pulse and skin, we should give calomel and opium in such manner as shall best induce a gentle mercurial influence. But when the failing volume and strength of pulse, and reduction of the temperature of the skin, indicate deficient blood supply, and a feebly acting heart, then, whether this state be consequent on long duration of the disease, or too antiphlogistic treatment in a constitution originally sthenic, or be in co-existence with the earlier stages of the disease in a constitution originally asthenic, we must abstain from the use of mercury. Its influence induced on the system in these conditions of the blood, and this state of action of the heart, will increase the exhaustion: instead of favouring the removal of lymph deposits, or, if not removeable, their organization, it will favour their degeneration into pus or sero-pus.

If I were asked to state a rule on this point of practice, that might be applied to clinical purposes, I should be disposed to say, that calomel and opium should only be given in the second stage of pneumonia, *in addition* to tartar emetic; and that when the state of pulse and skin are such as to contra-indicate the use of tartar emetic, mercurial influence is equally contra-indicated. In sthenic pneumonia it will be found, I think, that after the tenth or twelth day of the disease, mercury will no longer be appropriate; while for a very large proportion of the asthenic form, it is altogether unsuitable. It not only increases the asthenia, and favours the occurrence of softening or gangrene of the indurated lung, but the calomel and opium are very apt to cause irritation of the intestinal mucous lining, leading to dysentery or diarrhœa. This is a most unfortunate complication of asthenic pneumonia, and ought most carefully to be guarded against. The issue in several of the fatal cases of this series was hurried on by exhausting diarrhœa.

For the treatment of the second stage of the febrile form of pneumonia, mercurial influence is most inexpedient. We have, as I shall presently show, a more powerful agent in the sulphate of quinine. Moreover, I have always had the impression that mercurial influence was likely to be injurious in malarious fever. Twenty-four years' observation and practice in India have changed this impression into a firm conviction.

Blisters.—Blisters have been used in 82 cases; of these 52 recovered. It appears, then, that this remedy has been had recourse to in a greater number of cases than any other of the means which have been noticed. This has occurred, because blisters are more applicable to a greater variety of circumstances, —to the more advanced stages of those cases in which local blood-letting and antimony have been used, as well as to those for which these remedies have been considered inappropriate.

This greater experience of the use of blisters might seem to justify a positive opinion in respect to their therapeutic value; but this is not the case: it is difficult to come to a satisfactory

conclusion on this point. They are used in those more advanced stages of disease in which we cannot look for marked and speedy improvement under the use of any means of cure, and in which we must be satisfied with steady, progressive, though slow amendment. When the stage of pneumonia suitable for the use of local blood-letting has passed, then my impression, on the whole, is, that blisters may be had recourse to with advantage. If used too early in the disease, they are apt to re-excite the febrile disturbance, and to do harm. If used in very asthenic states, they are sometimes followed by troublesome ulceration, and the continued irritation thus arising does harm, by increasing the asthenia. On these points, then, we must be cautious. The blisters used in these cases have never been larger than four inches square. The liquor lyttæ has been the preparation generally selected.

Quinine.—The sulphate of quinine has been given in 56 cases; of these 37 were primary and 19 febrile: of the former 27 were recoveries, of the latter 15.

In the treatment of febrile pneumonia, in addition to such amount of local blood-letting and tartar emetic, and use of blisters, as the symptoms may justify, quinine should be given in adequate doses *during the remission.* It may be combined with tartar emetic. From 5 to 8 grains of quinine, with from $\frac{1}{6}$ to $\frac{1}{4}$ of a grain of tartar emetic, given at intervals of two or three hours for five or six doses, will, in general, suffice to check and then stop the febrile recurrences. When this effect on the febrile symptoms has been produced, it will generally be found that improvement in the pneumonia will at once commence; and in a large majority of cases, if the recurrence of the febrile state be prevented for some days, the inflammation of the lung will be speedily removed.* That this is a therapeutic fact, I am satisfied

* Frequent observation of this therapeutic fact, and a firm conviction of its importance in practice, dictated the confident expression of opinion in the text. During the three months that have elapsed since this paper was written, upwards of 10 cases of pneumonia in the second stage, with febrile symptoms of remittent type, have passed under my observation, chiefly in the clinical ward. This shows that these pathological states are of frequent

from the observation of many cases. The theory of it seems to me so simple that I am almost unwilling to take up the time of the Society by stating it.

There is no pathological fact more undoubted than this, that under the general deranged state of capillary circulation present in the febrile state, there is, after a time, longer or shorter, a tendency to the occurrence of inflammation of some structure or other.

In such circumstances it is a fair inference, that if we remove this febrile state, the general capillary circulation returns to its normal condition, and there must be a tendency, also, in the inflamed capillaries, to return to their healthy state. In the remittent forms of idiopathic fever, we possess in the sulphate of quinine an agent capable of removing the febrile state; and we find, as might have been anticipated, that when this remedy is influential in removing the fever, any local inflammation that may have co-existed with it is also speedily removed.

This principle of treatment has been also applied to many of the cases of primary pneumonia in asthenic subjects.

In my remarks on "Symptoms," I stated that the symptomatic fever of primary pneumonia is not unfrequently distinctly remittent in type, and that it seemed to me reasonable to assume, considering the asthenic condition of many of the inmates of the hospital, that it was so in consequence of the influence of malaria

occurrence in the hospital-frequenting classes of the Natives of Bombay. These cases, presenting themselves so immediately after the statements made in this paper, necessarily commanded my own close attention, and invited that of others interested in the subject. They amply sustained the efficacy of the treatment recommended. Indeed, I am not acquainted with anything more striking and satisfactory in the whole range of rational therapeutics than the progressive but speedy restoration of a hepatized lung, co-existing with fever of remittent type, *when the exacerbations have been controlled by the adequate use of quinine.* It is true that small local detractions of blood, the application of small blisters, and the use of ¼ grain doses of tartar emetic, have been had recourse to at the same time; but it is quite impossible for any one familiar with disease, and the action of these means in these degrees, to attribute the benefit chiefly to them, and not to the circumstance of the prevention of the febrile exacerbation by the action of the quinine.

being operative, and determining the character of the febrile phenomena. Influenced by these views, I have latterly, in all cases in which the remission was well marked, given quinine in combination with antimony, in the same manner as in the febrile cases, and very frequently with the same good effect; though I think that the improvement in the lung takes place more slowly. It is also very true, that in some of these cases, in which even the remission is well marked, we meet with disappointment: the quinine fails to control the exacerbation. It must then be omitted, and the other usual remedies appropriate for the case be trusted to.

Liquor Potassæ.—About two years ago, my attention was called to the use of liquor potassæ as a deobstruent remedy in the second stage of pneumonia.* It has been used during the last two years in many cases in the hospital for which mercury was considered unsuitable. It was given in doses of from ʒss to ʒiss every third or fourth hour in 10 of the recovered cases of this series, and, in general, continued for several days. In some the proportion of liquor potassæ was diminished, and from 6 to 10 grains of the sesquicarbonate of ammonia added, when the state of the pulse indicated the propriety of a stimulant. The general impression left on my mind was favourable to the use of the liquor potassæ; but this impression has not been confirmed by a careful consideration of all the hospital cases in which it has been used. I can only find 2, and they are not satisfactory, in which quinine on the principle just explained was not at the same time given. Being already satisfied of the therapeutic value of quinine in appropriate cases, I cannot feel sure of that of the liquor potassæ, when the two remedies have been given at the same time. Further careful clinical observation is therefore necessary to satisfy me in regard to the deobstruent efficacy of liquor potassæ in the second stage of pneumonia. The same may be also said

* I much regret that I am unable to refer to the publication in which the liquor potassæ was recommended. I omitted to make a note at the time, and I have been unsuccessful in my search for it. It was in one of the periodicals. I shall be glad to have the information supplied to me.

of the internal use of iodide of potassium, and the external application of the compound iodine ointment. I have had recourse to both in several cases, but I am unable as yet to offer any opinion in respect to their utility.

Stimulants.—There often comes a time in the treatment of cases of pneumonia, and it may do so very early in the asthenic form, when the failing pulse, the reducing temperature of the skin, and the feeble expectorating efforts, indicate the necessity of stimulants. The earliest tendency to this must be watched for, and stimulants given freely and assiduously. The sesquicarbonate of ammonia, with tincture of squills, wine, and arrack, are the most useful. At the same time chicken soup must be frequently given, and sinapisms or warm turpentine may be applied to the chest. By these means, if adopted in good time, cases that appeared hopeless are occasionally saved, more especially of youthful subjects.

Concluding Remarks.

In our review of these cases we have found that a large proportion of them came under treatment in the second stage of pneumonia, and that when the disease was confined to part of one lung, the rate of mortality of such cases was 17 per cent. I am not acquainted with other data exactly similar with which to compare these results. But the impression on my mind previous to my service in this hospital had always been that pneumonia in the second stage was a more fatal disease.

If, on the whole, success has attended the management of these cases, it is very expedient to endeavour to explain all the principles in accordance with which it has been directed. In a previous part of the report I stated, that in many of the cases a considerable time was required for the restoration of the lung. It has been also stated in another part of the report, that in many cases the cessation of the febrile symptoms, and relief of cough and dyspnœa, are not at once followed by lessening of the signs of consolidation of the lung; that several days may elapse before these begin to appear. The efficacy of local blood-letting, of tartar emetic, occasional mercurial influence

of blisters, and of quinine, has been acknowledged, and an endeavour has been made to explain the principles in accordance with which they have been respectively used. But in these principles we do not find anything that provides for the management of that period in the course of the disease when there is persisting consolidation of the lung, with little or no febrile disturbance, little or no cough, and dyspnœa: yet I am satisfied that it has been on the proper treatment of this condition of the disease that the successful issue of many of these cases has depended. If so, then it is necessary that I should state what the nature of this treatment has been, and the principles on which it has been directed. In the states of the disease to which I now refer, the pulse will be found to be of small volume, and easily compressed. This condition of the pulse, with absence of febrile* disturbance, at once indicates the appropriate method of cure. Antiphlogistics of all kinds, and especially the induction of mercurial influence, should be abstained from, and such degree of tonic regimen and tonic remedies should be used as shall gradually increase the quantity of blood, improve its condition, and the action of the heart: a light nutritious diet, pure air, nitric acid, quinine, and the preparations of iron, are the kind of means to which I allude.

That at different periods in the history of medicine there have been great errors in practice, is a truth which, with a view to future improvement, we are bound to keep steadily before us. Perhaps no better illustration of this truth can be found than the wavering faith in regard to the use of antiphlogistic and tonic means which has characterised the practice of medicine during the last twenty years and more. Those of us who were familiar with practice at the commencement of that period must have witnessed the destructive freedom with which antiphlogistic remedies were not unfrequently used, and must be sensible that there then was a very general blindness in regard to the value of

* I have not thought it necessary to notice those cases in which, with continuance of consolidated lung, we have hectic fever coming on, not cessation of the febrile disturbance. Such cases must be managed on the ordinary principles observed in the treatment of structural disease, and co-existing hectic fever.

tonic means. It was this defect in regular medical practice which has led to its falling into some degree of disrepute, and prompted the establishment of partial systems, as hydropathy and homœopathy, whose tendencies are tonic.

When we turn our attention to the present state of medical practice, I think we may observe that there is a growing tendency to commit the opposite error—to neglect antiphlogistic remedies, and to over-estimate tonics; to lose sight of great leading principles, and to act too much under the guidance of a fragmentary knowledge of animal chemistry.

If this be true, it is peculiarly the province of those who have practised medicine during this period of vacillation and uncertainty,—who have witnessed the advantages of the judicious use, and the evils of the abuse of antiphlogistic and tonic remedies,—to endeavour to hold the balance true between these two leading therapeutic indications, by stating the principles which such varied opportunities of observation may have left impressed upon the mind.

It is considerations of this nature which induce me now to explain, more fully than may seem really required, my reasons for attaching so much importance in certain states of pneumonia to the decided intermission of antiphlogistic, and the substitution of tonic treatment. The principles which I shall state are applicable to all inflammations.

It is inexpedient in a clinical report, in the present state of our knowledge, to attempt to apply the uncertainties of a refined physiology to pathology and therapeutics. It is sufficient for my present purpose that we may confidently believe, that when inflammation of a tissue exists, the leading indication which ought to be kept in view in order to its restoration is the maintenance of a normal state of the capillary circulation in the structures around. It matters not whether the restoration is to consist merely in stagnating blood being again set in motion; or in serous or lymph effusions being absorbed; or in the organization of lymph exudations; or in the degeneration of lymph into pus, with organization of a bounding sac, and processes for the evacuation of the pus, and the after reparation of the abscess; or in the granulation or cicatrization of ulcers. Whichever of these actions must be

gone through before the inflamed structure can be restored to the state of integrity of which it is susceptible, it should be a leading aim in the management of all to bring about and maintain a normal quantity, quality, and rate of movement of the blood in the capillaries around, and in the system generally. If there be symptomatic fever, with a pulse full, firm, and frequent,—the quantity, quality, and rate of movement in the capillary system is abnormal, and our means of correcting it are blood-letting, and other antiphlogistic remedies. But when the pulse becomes soft, and of moderate volume, there will be no more benefit to the inflammation by the continuance of general antiphlogistic treatment: on the contrary, there will be harm,—the pulse will become small and very compressible, states which are indicative of the presence of a quantity, quality, and rate of movement of the blood in the capillaries around the inflamed part, and in the system generally, as adverse to restoration, by whatever processes it is to be effected, as the opposite conditions of symptomatic fever. Under these circumstances of inflammation we cannot hope to do good, unless the tendency of our regimen and remedies be decidedly tonic.

These may seem very narrow principles, yet they are very useful in practice. They may seem trite and simple, yet I suspect that they are often lost sight of under the seductive influence of transcendental theories, inapplicable to practice in the present state of the science. But after all they reach further than may at first sight appear.

In the state of pneumonia to which reference is now being made, mercury is an injurious deobstruent, for it spoils the quality and lessens the quantity of the blood; but it is probable enough that a deobstruent may yet be discovered not having this unfavourable influence on the blood, and therefore applicable to the treatment of this state of consolidation of the lung. Still a tonic influence on the blood and action of the heart must be a leading indication of cure, for unless there be an adequate capillary circulation immediately around the deposits, there can be no absorption under the influence of any deobstruent. Again, the idea that many inflammations are dependent on the presence of a materies morbi in the blood is gaining ground as a pathological theory: very probably a true one. If so, elimination by the excretory organs must become a distinct indication of cure in the treatment of such inflammations. Still the aim to maintain a normal state of capillary circulation by antiphlogistics or tonics, as the case may be, must always be a leading indication: without it we can have no adequate action of the excretory organs, no sufficient elimination from the blood. It would be easy to increase the illustrations which tend to prove that whatever *special* therapeutic indications may arise in the treatment of particular forms of disease, suggested by physiological or chemical theories, there must always be the over-ruling therapeutic principle of maintaining as far as practicable a normal condition of the blood, and an adequate capillary circulation, general and local. This we must endeavour to effect, in some forms of disease by antiphlogistics, in others by tonics. The state of the pulse, and the general condition of the system, guide us to the use of the one or the other means.

In conclusion, I would observe that the argument might suggest itself to the mind, that what has now been written relative to the importance of attending to tonic treatment in the management of certain stages of inflammation is only of application to the present state of medical practice, and would be altogether unnecessary if every instance of inflammatory disease were submitted to judicious antiphlogistic treatment at its outset. Such an argument, however, would rest on an imperfect knowledge of pathology. There is no question of the fact that instances of pneumonia occur, which, though coming under treatment in the first stage, and judiciously treated, yet pass on to the second, and remain in that state for periods longer or shorter, and then gradually become restored to the healthy state. This is true of other inflammations also. The doctrine of critical days rests on the observed fact of the tendency of many instances of disease to run a certain course before they turn back in the direction of health. The theory is related to the pathological doctrine of the dependence of many forms and instances of inflammatory and other classes of disease on the presence of a materies morbi in the blood. But I must now close this report,—it forms no part of my present subject to engage in these speculations.

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RESULTS

OF

THE TREATMENT OF FEVER

IN

GLASGOW HOSPITALS AND OUT-DOOR PRACTICE

CONTRASTED.

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RESULTS OF TREATMENT OF FEVER.

I HAVE often had occasion to observe, that a very marked contrast exists between the mortality occurring in large hospitals in certain diseases, and that of the like diseases when treated at the homes of the patients; and this I have noticed to be especially the case in regard to the treatment of fever,—the mortality in hospitals far exceeding that of out-door practice. From the constant presence of fever in Glasgow—the frequent recurrence and increasing severity of wide-spread epidemics of the disease—the important truth that it prevails most extensively, and proves most fatal, at those ages when the life and health of individuals are of most value to themselves and to the community—the startling fact, indicated by the bills of mortality, that one-seventh of the whole deaths in Glasgow are caused by fever—and the circumstance that large numbers of fever patients are annually treated in the Glasgow hospitals;—for these cogent reasons, I have thought it an inquiry of no mean importance to ascertain if this excessive mortality is invariable, or only occasional—if dependent upon local or appreciable causes—if capable of being removed—and, in short, to arrive at more exact notions of the value of hospital treatment in fever, as far as regards the safety of individual sick persons, and the protection of the general community.

This inquiry cannot be solved by authoritative opinions; for in these there exists the greatest and most irreconcileable enemy to truth and argument. An inquiring mind is not now satisfied with knowing an opinion: it must inspect the materials from which that opinion has been elaborated, and the machinery by which it is constructed, before deciding upon its merits.

In following out this investigation, I have, therefore, availed myself of such sources of information as have enabled me to bring together a large mass of *comparable* facts regarding the experience of various hospitals and other institutions in the treatment of fever, and especially, among these, of the valuable series of medical statistics and case books, which are preserved in the office of the City Parish Parochial Board, and which contain, for a number of years, the results of out-door practice among the poor, as observed by the city district surgeons.[1] I purpose to adduce so much of these facts as may seem necessary to elucidate without encumbering the subject; for, however valuable the conclusions arrived at by statistical investigation may be, they lose much of that value when the precise data on which they have been founded are withheld.

Although my observations relate chiefly to Glasgow, yet a short reference to the experience of other localities will show, that the question is one of wide connections and of general interest.

In Limerick Fever Hospital, and in the Dispensary out-door practice,[2] the number of fever cases, with the results for the five years 1827-31, were—

Hospital.	*Dispensary.*
Cases, 5962.	Cases, 6130.
Deaths, 296,—or 1 death in 20 cases.	Deaths, 176,—or 1 death in 34 cases.

Here the deaths in hospital are seen to be nearly double those in the dispensary or out-door practice.

In coming nearer home, the contrast is no less strikingly marked. The number of fever cases treated in the Edinburgh Royal Infirmary,[3] during the three years 1840-41-42, were 2248, and the deaths 302—showing a mortality of 1 death in 7 cases. In the practice of the Edinburgh New Town Dispensary,[4] during the same years, there were treated 764 cases of fever, of which number 48 died—

[1] For authorised access to these materials, I am indebted to the ready courtesy of D. Anderson, Esq., chairman of the board. I may here mention, that the office of district surgeon is a public office, for the obtaining of which there has never been a lack of competition. Among the staff there have always been medical officers to public institutions, lecturers, and others of respectable status, and many have subsequently filled the offices of physician or surgeon to the Royal Infirmary. Among the names of former district surgeons which occur readiest to my recollection are Drs John Macfarlane, Andrew Buchanan, Granville S. Pattison, William Young, Auchincloss, William Weir, J. Stirling, J. A. Easton, J. G. Fleming, J. Watt, &c. &c.

[2] Dr W. J. Geary, in "Dublin Journal of Medical Science," 1837, p. 385.

[3] Annual Statistical Reports.

[4] Edinburgh Monthly Journal of Medical Science, vol. iii., pp. 659 *et seq.*

showing a mortality of 1 death in 14 cases. The contrast is here rendered more evident from the circumstance, that in the Infirmary cases there are included febricula, or mild cases of fever, while in the Dispensary report typhus cases only are given.

Further examples from other localities might be adduced, but are unnecessary.

The following table is of great interest, as it shows the total number of fever cases *treated* by the Glasgow district surgeons during eleven consecutive years, and also the total number treated in the Glasgow Royal Infirmary[1] during the same period.

Year.	District Surgeons.			Glasgow Infirmary.		
	Cases.	Died.	Mort. per cent.	Cases.	Died.	Mort. per cent.
1838..............	908	67	7·3	2,047	231	11·2
1839..............	255	16	6·3	1,529	253	16·5
1840..............	750	44	5·8	3,385	448	13·2
1841..............	1,221	59	5·2	2,578	265	10·2
1842..............	576	22	3·8	1,194	125	10·4
1843..............	14,584	413	2·8	3,553	179	5·0
1844..............	1,574	73	4·6	1,468	143	9·7
1845..............	352	18	5·1	538	75	14·0
1846..............	1,346	65	4·9	1,800	207	11·5
1847..............	7,038	484	6·9	5,224	804	15·4
1848..............	1,337	93	7·2	1,636	250	15·3
Total	29,941	1,354	4·5	24,952	2,980	11·9

It will at once be observed, that at no date has the mortality in out-door practice approximated to that in hospital, while the gross mortality for the whole period gives, in out-door practice, 1 death in 22 cases; and in hospital, 1 death in 8 cases.

A disproportion so great and so invariable could not escape notice or fail to excite comment, and I find, accordingly, that some of our Glasgow hospital physicians, and also of our district surgeons, have made public allusions to the subject. Thus Dr Moses Buchanan[2] says, that "the difference may be accounted for, in part, by the more severe cases being transmitted to the hospital in an advanced stage of the disease." Dr Orr,[3] alluding to the gross mortality of the hospital in 1846, says that "the severe nature of

[1] Annual Reports.

[2] History of Glasgow Royal Infirmary.

[3] Statistics of Glasgow Royal Infirmary for 1846: Edin. Med. and Surg. Jour., No. 171.

the cases treated" explains, in part, the increased mortality over the former year; and that another circumstance in explanation is "the fact, that during the year the numbers sent both to this and the *fever department* of the hospital in a dying state were unusually large. The practice of removing patients in such a condition from their own dwelling-houses deserves to be severely censured. This practice, I believe, prevails to a greater or less extent in the experience of most hospitals."

I deem it unnecessary to multiply additional opinions, as the statements quoted convey the substance of all that I can find advanced by hospital physicians in explanation of the increased mortality of fever in hospitals. It does not appear, however, that these opinions are based upon positive facts or actual inquiry, or that they are other than mere assumptions, founded upon individual impressions. And, as very decided counter-statements—to some of which will afterwards allude—are advanced on the part of the district surgeons, it is evident, as before stated, that no solution of the question is to be obtained from such sources of proof.

The chief conditions which seem to me likely to affect the mortality in fever, and which, therefore, require to be considered before any deductions can safely be drawn, are,—1st, the type of fever; 2d, the sex and ages of the patients; and 3d, the duration of illness prior to coming under treatment. These points I will take up and discuss in their several orders, making such comments upon the nature of the evidence as may be suggested by a common-sense view of the subject, and the impressions derived from my own personal experience as a district surgeon,—discriminating what seems essential, and what may be attributed to modifying influences.

And first, with regard to the type of the fever cases treated in hospital and in out-door practice. Various terms have been used to designate the varieties of fever which are found to prevail in Glasgow. Febricula, simple fever, continued fever, bilious, relapsing, gastro-hepatic, dothinenteric, typhus, &c. &c., are the expressions commonly employed, varying according to the peculiar views of the observers, the prevailing type, or the predominating symptoms. In comparing, as in the present inquiry, an extended series of observations, it is not necessary to attempt equal minuteness of detail; and I purpose, in my subsequent observations, to include all cases of fever under two names—*i. e.*, continued fever, and typhus. The term *typhus*, or *exanthematous typhus*, is in this city applied by common usage to that form of malignant fever always present in Glasgow, and which, among other peculiarities, is characterised, with few exceptions, by a measly rash appearing between the fourth and tenth days, and also by the circumstance, that the mortality greatly exceeds that of the other forms of fever, taken collectedly. The other common varieties of fever may conveniently, and with sufficient accuracy, be designated continued fever.

From the very excellent pathological statistics of the Glasgow Royal Infirmary,[1] the type of fever treated in that institution can be distinguished for the five years ending 1848. I find that during this period there have been treated in hospital, 10,666 cases of fever,—of which number 4856 were cases of typhus, and 5810 were cases of continued fever. This gives a proportion, in 100 cases, of 45·5 typhus, and 54·5 continued fever.

During the same five years there have been treated by the city district surgeons, 11,647 cases of fever,—of which number 7776 are reported as typhus, and 3871 as cases of continued fever. This gives a proportion, in 100 cases, of 66·8 typhus, and 33·2 continued fever.

There can be no question that the facilities for an accurate diagnosis of the type of fever are much greater in hospital than in out-door practice, where the diagnosis has often to be sought for amid darkness, dirt, and many discomforts. I am, therefore, disposed to think that allowance must be made for this circumstance, and that a considerable proportion of the cases termed typhus in the books of the district surgeon had been, in fact, only severe cases of continued fever. Still, after making every reasonable allowance for such a source of fallacy, *it is still abundantly evident that the number of cases of typhus, or the malignant form of fever treated in hospital, does not exceed the number treated in out-door practice.*

The proportional number treated of males and females requires to be next considered, as this has an important influence upon the gross mortality,—the male sex invariably furnishing the largest number of deaths.

The total numbers of each sex treated in the Royal Infirmary and by the district surgeons, during the eleven years 1838-48, were,—

Total Cases.	Males.	Females.	*Ratio per 100 Cases.*	Males.	Females.
Royal Infirmary, ...	12,697	12,255	Royal Infirmary, ...	50·8	49·2
District Surgeons, ...	13,460	16,481	District Surgeons, ...	44·9	55·1

The difference which is here seen to have existed in the relative proportion of the sexes, had undoubtedly an effect upon the total mortality; and, if sex alone were considered, the mortality in district practice would have been increased by a few deaths, in having had the same proportion of males and females as in hospital. But, as the ages of fever patients have a much greater influence upon the results, no comparison can be satisfactory, unless sex and age are taken in conjunction.

[1] Dr S. Orr, from 1844 to 1847,—afterwards continued by Dr C. Steele.

The tables published since 1838, by Drs Cowan, Orr, and Steele, of the ages, &c., of fever patients treated in the Glasgow Infirmary, give, collectively, an analysis of upwards of 16,000 cases,—a number sufficiently great to obviate the risk of any serious error. From the data furnished by this large number of cases, I have calculated, in similar proportion, the total cases treated in the Infirmary for the eleven years 1838 to 1848. The *actual number of cases and of deaths* for each sex are taken from the annual reports already indicated. I have also calculated in this table the proportion for each period of life which would be found in 100 cases, together with the corresponding mortality per cent.

Table of Age, Sex, &c., of Fever Patients treated in Glasgow Royal Infirmary.

Ages.	Cases.			Deaths.			Ratio per 100 Cases.			Mortality per Cent.		
	Total.	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.
Under 5 years,	148	65	83	14	8	6	0·6	0·5	0·6	9·6	12·6	7·2
5 to 10 „	998	592	406	36	15	21	4·0	4·6	3·3	3·6	2·5	5·1
10 to 20 „	7,568	3,495	4,073	414	191	223	30·3	27·4	33·2	5·4	5·5	5·5
20 to 30 „	8,538	4,464	4,074	939	581	368	34·2	35·1	33·2	10·9	12·8	9·0
30 to 40 „	4,090	2,171	1,919	660	420	240	16·4	17·1	15·7	16·1	19·3	13·0
40 to 50 „	2,304	1,256	1,048	544	340	204	8·1	9·9	8·5	23·6	27·0	19·4
50 to 60 „	834	407	427	228	127	101	3·3	3·2	3·5	27·3	31·2	23·6
Above 60 „	400	207	193	123	68	55	1·6	1·6	1·5	30·7	32·8	28·5
Not known,	72	40	32	22	13	9	0·3	0·3	0·3	30·1	32·5	27·2
Total, ...	24,952	12,697	12,255	2980	1753	1227	100·	100·	100·	11·9	13·8	10·0

From a very laborious examination of the daily registers or case-books of the district surgeons, I have collected the necessary particulars of nearly 17,000 cases,—from which data I have prepared a table, in correspondence with the foregoing, showing an analysis of all the cases of fever treated by the district surgeons during the eleven years already specified. These tables are in themselves interesting, as exhibiting on a large scale the nature of the cases occurring in out-door and in hospital practice, and they further furnish materials absolutely necessary to the elucidation of this inquiry.

Table of the Age, Sex, &c., of Fever Patients treated by the District Surgeons.

Ages.	Cases.			Deaths.			Ratio per 100 Cases.			Mortality per Cent.		
	Total.	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.
Under 5 years,	3,592	1,956	1,636	130	89	41	11·9	14·5	9·9	3·6	4·5	2·5
5 to 10 „	2,800	1,332	1,468	86	39	47	9·3	9·8	8·9	3·0	2·9	3·2
10 to 20 „	7,497	3,517	3,980	149	57	92	25·0	26·1	24·1	2·0	1·6	2·3
20 to 30 „	5,479	2,210	3,269	183	86	97	18·3	16·4	19·8	3·3	3·9	2·9
30 to 40 „	4,407	1,897	2,510	225	123	102	14·7	14·0	15·2	5·1	6·5	4·6
40 to 50 „	3,318	1,438	1,880	227	109	118	11·0	10·7	11·4	6·8	7·6	6·3
50 to 60 „	1,569	679	890	140	60	80	5·2	5·0	5·4	8·9	8·8	8·9
Above 60 „	1,279	431	848	214	91	123	4·2	3·2	5·1	16·7	21·1	14·5
Total, ...	29,941	13,460	16,481	1354	654	700	100·	100·	100·	4·5	4·9	4·2

On contrasting the two foregoing tables, the difference which exists in the relative proportion of cases occurring at decennial periods of life is seen to be very great. During the most valuable periods of life—viz., from 10 to 40 years—the cases which occur in hospital comprise more than three-fourths of the whole admissions, and the deaths for the same periods form a proportion not much smaller.

In out-door practice, on the contrary, the cases and deaths occurring at the same periods of life are little more than one-half of the whole number. These facts are important, and must not be lost sight of in estimating the advantages or disadvantages of fever hospitals.

The mortality occurring at different periods of life, both in hospital and in out-door practice, is also seen to vary much. In both there is a great proportionate mortality under 5 years of age. Between 5 and 10 years the deaths are much diminished. After 10 years the mortality steadily increases both in hospital and in out-door cases; the degrees of intensity being greatest in hospital, and increasing in a more accelerated ratio.

With regard to the number of cases treated at each period of life, it is shown that in out-door practice there occurs a much larger proportion of cases in early life, and in advanced age,—at which periods the mortality is very considerable; and it is evident that this disproportion must affect very materially the gross mortality. I find accordingly, on making the necessary calculations for correcting such a disproportion, that if the 29,941 cases treated in out-door practice had consisted of the same *proportion* of males and females, at each period of life, with that of the cases treated in hospital, there would have occurred only 1209 deaths, or 45 deaths *less* than actually did occur. On applying the same test to the hospital cases, I find that had the 24,952 cases treated in hospital consisted of the same proportion for each age with the out-door cases, the deaths in hospital would have been 3086, or 106 deaths more than actually did occur.

It is, therefore, abundantly evident that the greater mortality of fever in hospitals over out-door practice *is not owing to an over-proportion of cases of that sex, and at those periods of life, in which fever proves most fatal.*

It may be urged that my observations have too exclusive reference to the Royal Infirmary, and that this consideration should limit the deductions which I have drawn. To avoid such an objection, I have made special investigation into the results furnished during the last epidemic of fever, to which I will now refer somewhat in detail. This epidemic, which commenced in July 1846, steadily increased during the spring and summer of 1847, the utmost accommodation afforded by the Royal Infirmary proving very insufficient to meet the demands made upon it. The parochial boards of the city and barony parishes were then driven to the necessity of providing special hospital provision for the requirements of their sick poor, and, within a few weeks, the old Town's Hospital, at Clyde Street, was fitted up with a large number of beds (ultimately exceeding 600), for the accommodation of the city poor; and for the poor of the barony parish temporary wooden erections were prepared at Anderston, for the reception of about 250 patients,—the parochial managers displaying on this occasion an amount of energy and of disinterested exertion which has been ill understood and little appreciated by the general public.[1] Clyde Street Hospital was opened in the beginning of July 1847, and from this date until the decline of the epidemic in June 1848, there were treated in it 5404 cases of fever. In the Anderston Hospital, which was opened August 1847, there were treated in the eleven months ending June 1848, 2620 cases of fever. Both Clyde Street and Anderston Hospitals were filled with fever patients, within a few days of their being opened, thereby affording immediate relief to the over-crowded wards of the Infirmary.

Here, therefore, we have the fairest elements for comparison. Three hospitals open at the same period for the treatment of fever patients—viz., the Infirmary, Clyde Street, and Anderston Hospitals. In the two latter the patients treated were exclusively the very poorest of the population; but I am satisfied that no real distinction of class existed between these and the infirmary patients. The cases treated by the district surgeons were essentially identical with

[1] No account has previously been given of the nature and results of the cases treated in Clyde Street Hospital. A very excellent report of the operations carried on in the Anderston Hospital was prepared by Dr Paterson, the house-surgeon and superintendent,—an abstract of which was published in the Edin. Med. and Surg. Jour. for 1848. I am indebted to Dr Paterson for much necessary information regarding this hospital.

those treated in the parochial hospitals. There is, therefore, to be compared the same class of poor, the same epidemic fever, and the same period of time. The following shows the numbers treated, and the results :—

	Total number treated.		Total Deaths.	Mort. per Cent.		
Royal Infirmary	3531	...	579	16·4,	or 1 death in	$6\frac{57}{579}$ cases.
Anderston Hospital,	2620	...	303	11·5	,,	$8\frac{196}{303}$,,
Clyde Street Hospital,	5404	...	799	14·8	,,	$6\frac{610}{799}$,,
City District Surgeons,	4852	...	306	6·3	,,	$15\frac{262}{306}$,,

The proportionate number of males and females treated in the infirmary at each decennial period of life differed little from the general table, so far as I can judge from the tables prepared by Dr Steele for 1847, and one prepared by myself for 1848. In the cases treated by the district surgeons, the only difference from the general table consisted in a larger proportion of cases under 5 years, and in a greater proportion of males,—the number of both sexes being nearly alike. I consider it, therefore, unnecessary to bring forward tables of the infirmary and out-door cases for this period. The following table shows the age, sex, and results, of the cases treated in the Clyde Street and Anderston Hospitals :—

Table of Fever Cases treated in Clyde Street and Anderston Hospitals.

Ages.	Clyde Street Hospital.						Anderston Hospital.					
	Cases.		Deaths.		Ratio per 100 Cases.	Mort. per Cent.	Cases.		Deaths.		Ratio per 100 Cases.	Mort. per Cent.
	M.	F.	M.	F.			M.	F.	M.	F.		
Under 5 yrs.,	47	43	9	8	1·6	18·8	10	4	1	...	0·5	7·1
5 to 10 ,,	200	191	21	21	7·2	10·7	115	117	5	4	8·8	3·9
10 to 20 ,,	709	828	54	63	28·4	7·6	398	434	27	18	31·7	5·4
20 to 30 ,,	861	809	136	99	30·9	14·0	367	290	55	23	25·1	11·9
30 to 40 ,,	480	408	95	51	16·4	16·4	208	210	31	19	15·9	11.9
40 to 50 ,,	283	268	79	63	10·2	25·8	176	137	44	24	11·9	21·7
50 to 60 ,,	111	84	39	29	3·6	34·9	66	48	22	14	4·4	31·6
60 and upwds	42	40	18	14	1·5	39·0	15	19	7	8	1·3	44.1
Not known,	...	...	...	...	...	...	3	3	1	...	0·2	16·6
Total, ...	2733	2671	451	348	100·	14·8	1358	1262	193	110	100·	11·5

The proportion of cases treated at each age in Clyde Street Hospital is seen to approximate very closely to that of the Anderston Hospital, and the differences which do exist have very little influence upon the gross mortality. A considerable contrast is, however, observed in the general mortality; but this depends on other causes than the age and sex of the patients. I will afterwards allude to this discrepancy, and indicate some of the causes which affected unfavourably the mortality in the Infirmary and Clyde Street Hospitals.

In other respects there is nothing in these tables which seems to claim special notice, or to alter the deductions which may be drawn from those already given.

The next division of my inquiry relates to the period of disease at which cases of fever are brought under treatment.

The following table shows the period of admission and the results in 9477 cases of fever treated in hospital during 1847-8,—viz., all the cases treated in the parochial hospitals as already specified, and as large a proportion of the cases treated in the infirmary during 1848 as I could procure information regarding ;—also of 3006 cases of fever treated by the district surgeons during the intensity of epidemic fever :—

No. of days ill on admission.	Infirmary during 1848.		Clyde Street Hospital.		Anderston Hospital.		Tot. Hospital cases.		District Surgeons.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1 day	...	...	6	2	30	3	36	5	20	...
2 days	18	...	101	11	45	...	164	11	158	6
3 „	49	6	336	32	128	8	513	46	160	8
4 „	141	15	787	101	289	23	1217	139	574	32
5 „	191	20	565	68	310	25	1066	113	270	20
6 „	187	21	496	70	324	38	1007	129	358	14
7 „	184	23	249	35	251	30	684	88	170	11
8 „	230	43	551	83	340	39	1121	165	486	55
9 „	95	12	77	14	173	18	345	44	80	5
10 „	91	21	150	23	183	19	424	63	170	23
11 „	35	5	10	2	62	8	107	15	30	3
12 „	36	4	81	13	67	11	184	28	63	5
Above 12	56	5	201	31	178	26	435	62	363	23
Not known	140	39	1794	314	240	55	2174	408	104	12
Total.......	1453	214	5404	799	2620	303	9477	1316	3006	217

This table shows, in a very evident point of view, that *the mortality from fever, both in hospital and in out-door practice, is lessened when the cases are brought under treatment at an early period of the disease*, and, consequently, is a strong testimony to the efficacy of medical aid. But it farther shows that *the greatest proportion of cases are brought under treatment at as early a period as could be reasonably anticipated*. Both of these circumstances will be rendered more apparent from the subjoined table, which is a summary of the preceding, with the addition of columns which exhibit the proportion of cases admitted within each of the four periods into which the table is divided, together with the corresponding rate of mortality; those cases in which the previous duration of illness is unknown, being for obvious reasons omitted.

Duration of illness prior to admission.	Hospital Cases.				Out-door Cases.			
	Cases.	Deaths.	Ratio per 100 cases.	Mort. per cent.	Cases.	Deaths.	Ratio per 100 cases.	Mort. per cent.
1 to 4 days	1930	201	26·4	10·4	912	46	31·4	5·0
5 to 8 „	3878	495	53·1	12·8	1284	100	44·2	7·7
9 to 12 „	1060	150	14·5	14·1	343	36	11·8	10·5
Above 12 „	435	62	5·9	14·3	363	23	12·5	6·3
Total......	7303	908	100	12·4	2902	205	100	7·0

In the ratio of admission, no very great discrepancy is observed between hospital and out-door cases, the latter having a slight advantage in the very early cases, counterbalanced, however, by the larger proportion of cases at an advanced period of the disease. In both kinds of practice there are fully one-fourth of the cases brought under treatment within four days of the commencement of illness, and three-fourths of the whole within the eighth day of illness. In both, the mortality is lowest among the cases seen from the early periods of the disease, and in both it continues afterwards to increase, —always, however, preserving this important distinction, *i. e.*, a very marked disproportion in the rate at which the mortality advances; that of hospital being so high from the very commencement, that, *although all the cases treated there had been received within the first few days of the attack, the gross mortality would not have been greatly diminished*. There is also a farther contrast in the circumstance, that in out-door practice the mortality diminishes in cases seen after the twelfth day of the fever. Nor does the disadvantage experienced in hospital, of having a smaller proportion of the early cases, make any notable difference in the mortality; for, if the cases admitted into hospital at the four periods shown in the table had been in the same proportion with the cases treated in out-door practice, I find, on making such a calculation, that the deaths in hospital would still have been 900, or only 8 deaths less than actually did occur.

And here I cannot forbear digressing to express my surprise that the cases admitted into hospital at an early period of the disease are so numerous, considering the obstructions that interfere with their prompt and ready admission. I do not allude to the unavoidable loss of time in sending the fever conveyance for the patient, but to the delays which occur in consequence of the patient's friends, and not unfrequently the surgeon, being under the necessity of hunting after employers, subscribers, or others, the patrons of the Infirmary, to procure an order for the admission of the patient, or to get the medical certificate countersigned. This faulty state of matters applies chiefly to the permanent hospital, the Infirmary; in the temporary hospitals, during the pressure of the epidemic, prompt admission was given upon the mere certificate of the district surgeon.

Another cause exists by which the number of late admissions is increased, *i. e.*, the type of fever. Typhus is often insidious in its approach, and in some cases it is difficult for the first few days to determine that the case is one of fever; while several days invariably elapse ere its peculiar nature can be recognised with certainty. It becomes, therefore, a matter of some consequence to ascertain the period at which typhus cases are received into hospital, and how far the mortality is thereby affected. The following table shows the number of cases, and the ratio of admission and of mortality of typhus cases included in the table (p. 12), and treated in the Royal Infirmary and Anderston Fever Hospital—the cases in Clyde Street Hospital being omitted, as in it the type of fever was frequently not stated :—

Table of Typhus Fever Cases treated in Hospital.

Ill prior to admission.	Cases.	Deaths.	Ratio of admission.	Mortality per cent.
Under 4 days ill..................	238	45	11·4	18·9
5 to 8 ,, ...	1159	189	55·7	16·3
9 to 12 ,, ...	544	94	26·1	17·3
Above 12 ,, ...	140	25	6·7	17·8
Total known..................	2081	353	100	16·9
Length of illness unknown.....	247	64	...	25·9
Total..................	2328	417	...	17·9

The results which this table exhibits are at variance with the general table including both kinds of fever, and are to me somewhat surprising, not as regards the large proportion of cases received between the fourth and twelfth days, for this might have been anticipated, but as regards the fact, that cases of typhus fever, sent into hospital within the first few days of the attack, should die in larger proportion than cases sent at a more advanced period of the disease. Several returns which I have procured from other places, exhibiting the results of a limited number of cases, are also confirmatory of this fact;—whatever explanation may be given of the circumstance, this inference remains clear, that the gross mortality from fever in hospital is not increased over that of out-door practice, neither by an excessive proportion of typhus cases received at an advanced period of the disease, nor by a disadvantageous proportion in the general ratio of admissions of all the cases of fever treated in hospital.

But it has been sometimes stated that the district surgeons were in the practice of sending cases of fever to the hospital so soon as such cases commenced to put on unfavourable symptoms, and that in this way they were more likely to have selected cases under treatment. Before referring to the special testimony on this point, which has been given by various district surgeons, I have thought it better to analyse a large number of cases, to show the interval which occurs from the time of fever patients being first visited by the district surgeon to that of the case being sent into hospital. The following table, containing the experience of 1401 cases, has been taken at random from the books of seven districts :—

No. of Days ill when first visited.	Total cases.	Sent to Hospital after an interval of							
		A few Hours	1 Day.	2 Days.	3 Days.	4 Days.	5 Days.	6 Days.	Above 6 days.
1 day	33	2	2	2	14	4	4	2	3
2 days	130	32	44	14	12	12	8	6	2
3 ,, ...	174	52	44	38	22	10	6	1	1
4 ,, ...	290	134	82	32	22	10	6	3	1
5 ,, ...	186	66	68	26	12	6	2	4	2
6 ,, ...	190	74	60	32	10	10	2	2	...
7 ,, ...	80	30	26	16	6	2	...	...	...
8 ,, ...	194	78	58	28	6	6	8	6	4
9 ,, ...	18	4	8	6	...	...	...	...	...
10 ,, ...	38	12	20	...	...	...	...	...	...
11 ,, ...	6	2	4	...	...	...	...	4	2
12 ,, ...	10	8	...	...	2	...	...	...	...
Summary.									
1 & under 4 dys.	627	220	172	86	70	36	24	12	7
5 — 8 ,,	650	248	212	102	34	24	12	12	6
9 — 12 ,,	72	26	32	6	2	...	...	4	2
Above 12 ,,	20	6	2	8	...	2	...	1	1
Not known.....	32	4	14	12	...	...	2	...	...
Total	1401	504	432	214	106	62	38	29	16

Here there is very decided proof that no unnecessary delay takes place on the part of the district surgeons in sending their cases into hospital, for fully *one-third* of the whole are sent within a few hours of their being first visited, and not more than a tenth part are removed after the third day from being first seen. Moreover, in a great proportion of those cases which are sent at a late period of the disease, the district surgeons seem anxious to prevent any impression being entertained that the removal had taken place at their instigation, for they append notes to their daily case-books to the effect, that the patient has been "sent by his employer," or "by his friends," or "by the landlord of the property," or "because there is no attendance," &c.

So far, therefore, as figures can elucidate the subject, there is no foundation for the statement in question; and indeed it must be evident that the district surgeons had been gifted with a nicer tact or intuitive sagacity than they are likely to claim for themselves if they could, at the commencement of a case of fever, or within the short period spoken of, discriminate the worst cases and weed them out to be sent off to hospital, even supposing their impressions and their feelings of professional responsibility sanctioned such a line of conduct. As this point is, however, one of much importance, I think it necessary to cite additional evidence, and of such a nature as to supersede the need of argument.

Dr William Weir, presently one of the physicians to the Royal Infirmary, and whose experience as a district surgeon was most extensive, says, in reference to this question, "This I know has not been the case for some years, but rather the contrary; and I have been so impressed with the fact, that removing patients after the fever has advanced, and the low typhoid symptoms are present, is attended with bad consequences, that I seldom recommend any to the hospital but the mildest; and in this, I believe, I am joined by the majority of the town surgeons."[1] In the 5th vol. of the Glasgow Medical Journal, the editor gives the assertion in question "a most positive contradiction;" expresses surprise that it should have been made, and states, "it was almost uniformly the mildest cases of that disease that were sent to hospital; and when severe cases were sent it was contrary to the desire of the district surgeon, who knew well that the removal of a patient lying dangerously ill of fever was uniformly attended with a very serious increase of symptoms, and not unfrequently with the conversion of a mild case into a very serious one." Dr J. A. Easton, presently one of the physicians to the Royal Infirmary, and also of great experience as a district surgeon, complains that "such heartless conduct" should be imputed to the district surgeons, "as that of sending only the worst cases of fever to the Infirmary, converting thereby this noble charity into a sort of receiving-house for the unclaimed dead;" and he gives "the gratuitous aspersion an unqualified denial."[2]

The convictions of my own experience as a district surgeon, which has also been considerable, induce me to add my assent to the foregoing testimony. I am well satisfied that the majority of the district surgeons have not at any time been so ignorant or so unreflecting as to subject their worst cases of fever to the risks generally associated with the idea of removal to hospital, nor to dally unnecessarily with such cases as were removed with their sanction.

A very interesting and useful subject of inquiry now remains open —*i. e.*, to trace the causes which imperil the life of an hospital fever patient, and so frustrate the efforts of active benevolence, and the

[1] Glasg. Med. Jour., vol. i. p. 222. [2] Glasg. Med. Jour., vol. vi. p. 286.

objects sought to be attained by a lavish expenditure of money. This inquiry does not, however, form a necessary part of my present task, and I will, therefore, limit my remarks on this point to a short consideration of a few circumstances which contribute to the result.

In the first place, there seems no good reason for doubting the numerous facts collected by various recent parliamentary commissions, and which show that the aggregation in one building of a large number of human beings in a state of disease re-acts with deleterious influence, and lowers the general tone of vitality of the whole inmates. When the wards or sleeping apartments become crowded, the effects are very apparent, and a public institution so circumstanced has been aptly compared to "a town without party walls in a fire." Illustrations might readily be adduced if space permitted. I may, however, allude to the great but varied mortality which occurred in the Glasgow hospitals during the late epidemic fever, as connected with the subject of over-crowding. During the intensity of the epidemic, and up till July 1847, at which date the Glasgow parochial directors had provided accommodation for their sick poor, the Royal Infirmary was subjected to a pressure which, under the existing circumstances, could not be resisted, and every available space in the fever buildings was "filled" with fever patients. In January 1847 the average number of fever cases in the Infirmary was 259,[1] and this large average increased steadily until in July it reached the *maximum* of 369 cases. With the opening of Clyde Street hospital, the average number in the Infirmary fell immediately to 278, and continued thereafter to decline in a steady ratio. Simultaneously with a declension in the average number of cases, there also occurred a fall in the average mortality; for the deaths which, in January, had averaged 12 *per cent.*, and had increased *pari passu* with the increasing average numbers of the inmates, until in July the mortality reached nearly 18 per cent., now underwent a decline. In August the average mortality fell to 14 per cent.; in September to 12 per cent.; and in October to 11 per cent. In commenting upon the mortality in the Infirmary for 1847, Dr Steele remarks,[2] "It is worthy of notice in this place, though, perhaps, to the prejudice of our fever hospital, that the mortality returns of the fever cases treated throughout the city, both in the parochial hospitals and by the district surgeons, averaged much less in proportion than those of the Infirmary, and it scarcely admits of question that the accommodation afforded by the regular hospital is infinitely superior to that outside. These facts tend to favour the supposition, that the miasmata engendered by long concentration in the wards of an hospital has a decidedly prejudicial effect on the disease itself."

In Clyde Street hospital the mortality was less than in the Infirmary. Clyde Street hospital is an old low-roofed building, at one

[1] Annual Reports. [2] Edin. Med. and Surg. Jour., 1848, p. 106, *et seq.*

time the city poor-house. Some temporary additions to its accommodation were made soon after its being opened, and the extreme accommodation, when completely filled, consisted ultimately of 634 beds. Such, however, was the extreme pressure of the epidemic that 720 patients were admitted within the first two or three weeks. In August not less than 992 new cases were admitted, and the average admissions from July to November, inclusive, were upwards of 800 new cases per month, while the average number constantly in hospital during the same period exceeded 600. I have no doubt that the large mortality which did occur would have been still greater had the building been previously occupied as a regular fever hospital, and its wards, consequently, affected by "the miasmata engendered by long concentration." I am also of opinion that the lesser mortality in Clyde Street hospital, as compared with the Infirmary, is to be attributed in part to the circumstance of its patients having to be conveyed a comparatively short distance.

The lowest hospital mortality was experienced in the Anderston hospital. This building consisted of temporary wooden sheds, with slated roofs, constructed for the occasion. The wards were, consequently, and *unavoidably*, well permeated with currents of air; and the hospital not having been exposed to the same pressure which overflowed the Infirmary and Clyde Street hospitals, the wards were never in a state that could be called crowded. Mr Hannay, chairman of the committee which executed all the arrangements connected with this hospital, has informed me of an incident worthy of being noticed. At one period, on account of soot and rain finding a ready ingress through the interstices of the slated roof, it was considered advisable to form a temporary ceiling by pasting together in close layers large sheets of brown paper between the rafters, and this expedient was accordingly adopted in one section of the building. But coincident with this alteration in the structure of the wards, there occurred such a marked increase in the malignancy of the symptoms and in the number of deaths, that the temporary paper ceiling was destroyed without hesitation, and the experiment, as regarded the other parts of the building, abandoned. The unfavourable conditions mentioned then disappeared. A less crowded and better ventilated condition I consider to have been the chief influence which determined the comparatively low rate of mortality in this hospital.

Whilst much of the increased mortality of fever in hospitals must be ascribed to the deleterious influence of concentrated exhalations from the living body in a state of disease, some influence must be ascribed to the moral effects upon the weakened mind of a patient who finds himself suddenly removed from the solacing attentions of those who from natural affection loved him, and, instead, tended by strangers upon whose sympathies he feels he has no claim, and surrounded by the dying and dead of the hospital ward. The depressing effect of such an influence cannot well be estimated; but that such

an effect is produced, is in accordance with general experience, and must be obvious.

But the mere transference of a fever patient to hospital has an immediate influence upon the general mortality, which requires notice. In the records of hospitals there are frequent entries of cases termed "moribund on admission." The deaths from fever in Glasgow Infirmary in 1846 were 207, and Dr Orr[1] states, on the authority of "a very accurate table kept for him by Mr Brown, the janitor of the Royal Infirmary," that, "In 74 of the deaths in the fever wards, the patients had been less than thirty-six hours in hospital, and of these 38 died within twenty-four hours, and 16 within twelve hours after admission." Such a statement is very startling, but no fair inference can be deduced unless the previous duration of illness is also known. To illustrate this point I have constructed the following table, showing the length of illness prior to admission, and the total duration of illness at the period of death in 1316 fatal cases of fever (see p. 12) treated in the Royal Infirmary, Clyde Street and Anderston hospitals, and a similar table of 217 fatal cases occurring in out-door practice. I have also prepared corresponding tables, which show the proportion out of 100 deaths which occurred within successive intervals of four days after coming under treatment:—

	Duration of illness prior to admission.	Total Deaths.	Total duration of illness.							Ratio per cent. of Deaths at each period.						
			Under 4 days.	5 to 8 days.	9 to 12 days.	13 to 16 days.	17 to 20 days.	21 to 24 days	Above 24 days.	Under 4 days.	5 to 8 days.	9 to 12 days.	13 to 16 days.	17 to 20 days.	21 to 24 days.	Above 24 days.
Hospital Cases.	1 and under 4 days,	201	2	48	27	31	21	16	56	1·9	23·9	13·4	15·4	10·4	8·0	27·8
	5 — — 8 —	495	...	34	114	98	63	45	141	...	6·9	23·0	19·8	12·7	9·0	28·9
	9 — — 12 —	150	...	...	16	44	22	22	46	...	...	10·7	29·3	14·7	14·7	30·6
	Above 12 —	62	...	...	...	6	7	11	38	...	...	...	9·7	11·2	17·7	61·3
	Not known,.........	408	139	64	44	36	24	27	74	34·0	15·7	10·8	8·8	5·8	6·6	18·1
	Total,.........	1316	141	146	201	215	137	121	355	11·0	10·9	15·3	16·6	10·2	9·2	26·7
	Total Cases known	908	2	82	157	179	113	94	281	0·2	9·0	17·3	19·7	12·4	10·3	30·9
Out-door Cases.	1 and under 4 days,	46	3	8	9	12	5	6	3	6·5	17·4	19·5	25·2	10·8	13·0	6·5
	5 — — 8 —	100	...	3	27	31	17	7	15	...	3·0	27·0	31·0	17·0	7·0	15·0
	9 — — 12 —	36	...	...	7	15	6	3	5	...	...	19·4	41·6	16·6	8·3	13·8
	Above 12 —	23	...	...	...	7	1	7	8	...	...	...	30·4	4·2	30·4	34·7
	Not known,.........	12	8	...	1	1	1	...	1	66·6	...	8·3	8·3	8·3	...	8·3
	Total,.........	217	11	11	44	66	30	23	32	5·0	5·0	29·4	30·4	13·8	20·6	14·7
	Total Cases known	205	3	11	43	65	29	23	31	1·4	5·4	20·9	31·7	14·1	11·2	15·1

This table presents several points of interest which do not properly come within the scope of my present inquiry. One circumstance requires special notice—*i. e.*, the large proportion of deaths which occur in hospital within a few days after admission. The greatest number of deaths, both in hospital and in out-door practice, take place between the 13th and 16th days of illness,—the proportion of deaths gradually rising till this critical period, as it may be termed,

[1] Edin. Med. and Surg. Jour., 1838.

and declining afterwards, as from a culminating point. But, while in out-door practice this ratio is regular and progressive, there is in hospital an irregular and suddenly increased proportion, who die within the first few days after their admission, *and prior to the critical period*. This peculiarity will be better understood on referring to that portion of the table which shows the ratio per cent. of deaths occurring at given periods;[1] but the matter will be placed in a still clearer light by a reference to the number of cases which proved fatal within 48 hours after admission into hospital. The following table includes all such cases in the experience of Clyde Street and Anderston hospitals; but does not include the Infirmary, as the materials from which I have prepared the Infirmary cases show the duration of illness only in days:—

Ill prior to admission.	Total Deaths.	Died. Under 6 hours.	6 and under 24 hours.	24 and under 48 hours.
Not more than 4 days	18	2	4	12
5 to 8 days	36	5	13	18
9 to 12 „	9	2	6	1
Above 12 „	8	...	3	5
Not known	72	8	39	25
Total	143	17	65	61

The inference deducible from such facts undoubtedly is, that the mere act of transference to the hospital *accelerated* the deaths of this over-proportion of patients who died within a few hours of their admission into hospital. It is also only reasonable to infer, that the same injurious influence, which in so many cases had a well-marked effect in *accelerating the period of death*, must have operated prejudicially upon these and upon other cases, and so *increased the susceptibility for death*. It appears, indeed, that, although in most of these cases the fitness of the parties to bear removal had been previously determined by a medical man, there were, nevertheless, upwards of one in every nine of the whole fatal cases, which proved fatal within 48 hours of being admitted into hospital.

In out-door practice the district surgeon has not unfrequently to regret that he is only called in to be present, and to sanction with the name of medical attendance, the struggle of death; but the pro-

[1] The table is read thus:—Of 100 fatal cases, which, when admitted into hospital, were from 1 to 4 days ill, 1 died within a few days after admission; 23 died within 4 days after admission; 13 died within the next 4 days; 15 died between the 13th and 16th day of their illness; and so on.

portion of such cases does not amount to one-half that which occurs in hospital experience, and it is chiefly limited to those cases seen about the critical period, and not at that early stage of the disease when the energies of the patient are comparatively vigorous.

The mere removal of a fever patient must, therefore, be reckoned a great evil as regards the patient. It has always been so considered by the district surgeons. Dr Easton[1] regards it as one of the most important of those influences which increase the mortality from fever in hospital. He says, that "the *vis medicatrix naturæ* is counteracted by the removal, to insist on no other evil, of fever patients to the Royal Infirmary. The risk of removing a patient, after fever is fairly formed, to any place, is, of course, equally as great as it is to the Infirmary. Almost every one who has had much experience in the treatment of fever knows that perfect rest, low diet, regulating the bowels, and applying cooling lotions to the head, &c., are in six cases out of ten all the requisites in the cure of fever, and that under such means the disease will exhaust itself, by running its regular course; reverse the circumstances of the patient,—let him, after he has been under the complaint for four or five days, be removed in the erect position to the distance of half a mile, more or less,—let him there be subjected to the coarse operation of the tonsor, and the debilitating influence of the warm bath,—let his 'throat thereafter be made a thoroughfare for wine,'—and will any man deny that there is treatment which, in nine cases out of ten, the case, if left at home, would not have required? It is *the removal of patients*, then, after the disease is formed, which is the chief cause of danger, but not the only one. Having, however, already recited the prologue, I need not pursue the tragedy; yet, O, shade of Armstrong! think only of the *opium*, the *cerevisia fortis*, the *spiritus vini Gallici*, &c. &c., and say do such follow out the indications of cure!"

Setting aside all allusions to difference in medical treatment, which, indeed, are here evidently made in a sportive manner—for Dr E. distinctly states, that there is no intention, on the part of the district surgeons, "to arrogate a superiority to their neighbours in the treatment of fever"—there is very much of truth in his remarks. I have been told of patients dying on their way to hospital; of others, who, on their arrival, were in such an extreme state of exhaustion, that there was really not time to have their names transferred to the medical books ere they expired; and I have seen entries in fever hospital books of patients, who, on their arrival, were placed in the *customary warm bath*, and who actually "died in the bath!"

Such facts, with others sufficiently familiar to those having much experience in hospital practice, show that there are circumstances, some of which are partially, and others entirely, beyond

[1] Glasgow Medical Journal, op. citat.

the control of the physician; and which run up the total number of deaths, and, consequently, limit very much the accuracy of any deductions drawn from hospital statistics, in reference either to the skill of the medical officers, or the results of any special mode of treatment.

Enough has been now adduced to establish the fact, that the mortality from fever in hospital very far exceeds that of out-door practice; and that this difference is not attributable to any disadvantage with regard to the nature of the cases which come under treatment. If this conclusion is admitted (and it seems unavoidable), it then becomes a matter of very grave consideration, how far fever hospitals are serviceable to the community, and how far they can claim the suffrages of the medical profession. This question is not now started for the first time. In the Fifth Annual Report of the Registrar-General, there occurs the following striking passage :—

"When the house is small, and perhaps dirty, it appears a great act of charity to remove a poor man—suffering from fever, for instance—to an hospital, where he is provided not only with skilful medical attendance and with physic, but with the proper diet, warmth, and nursing. But have the benevolent founders of hospitals, and the medical officers who generally give their services gratuitously, sufficiently reflected on the probable consequences of bringing 50, 100, 300, or 400 sick bodies under the same roof, and into a few yards, which the sickly breath saturates? Have they ever compared the results of cases treated in hospitals, and in the poorest houses? When hospitals are crowded, the increase of mortality soon becomes striking. In the Hotel-Dieu, at one time, one in every four persons who entered the pestilential walls died. The mortality in the large metropolitan hospitals is twice as great as in the smaller country hospitals. This cannot be ascribed to defect of medical skill in the metropolis. Erysipelas and gangrene are still not infrequent in hospitals. The patient is fortunate who escapes phlebitis or purulent deposits, after any serious operation, in an hospital. It is the adventitious disease, and not the knife of the surgeon, that is fatal. Are not the effects of general hospitals of the same nature as those that have, more than once, led to the evacuation of lying-in hospitals? I have rarely seen any statement of the mortality of fever, small-pox, or any other disease, in which it did not appear that a person was twice as likely to die in an hospital, as a person suffering from the same disease out of doors. It is generally said,—'Yes, we admit that our mortality is high; but the worst cases are sent, in the last stage of illness, to the hospital.' Is this certain? Will it account for all the difference? I doubt it very much. And I express the doubt, in the hope that the question may be strictly, honestly, and conscientiously investigated by some qualified person, who has time to devote to the subject. Until this be done, no attempt should be made to extend the system of assembling the sick in the same buildings."

This is the question I have endeavoured, in some measure, to elucidate; but it would be to me a matter of great regret, if the tenor of these observations had the effect of impairing the real usefulness of fever hospitals. This is far from my intention. But I believe that much ignorance—or, at least, uncertainty—prevails upon the subject, and I am satisfied that no real evil can result from its fair discussion. While some, from their peculiar and limited experience, raise an incessant appeal for increased hospital accommodation, others are probably too ready to denounce their existence, as productive of unmitigated evil. I have endeavoured, by a cautious

comparison and analysis of results, to arrive at a juster conception of their real value. I have not too rigorously drawn conclusions from the facts which I have collected, knowing that there are many drawbacks upon the absolute accuracy of statistical tables, and that considerable allowance must be made for disturbing causes.

I am now satisfied that, in many respects, fever hospitals are injurious—they entail a great expense—they have but a small influence on those evils which they are intended to prevent—they are subject to other evils which it is almost impossible to avoid—and the hazardous relief they do proffer can be obtained often only by a sacrifice of some of the best feelings of our nature. But I am also satisfied that they must be regarded as necessary evils; and so far necessary, in the present condition of such a city as Glasgow, that I would approve of their number being increased,—providing always, that *the present barriers which prevent the prompt and free admission of fever patients were at the same time done away with.* I would approve of the erection of *district hospitals* (as first recommended by Dr Cowan),—small, unpretending edifices, capable of accommodating fifty or sixty patients, and established in those situations where fever is known most to prevail. Cases do occur—and will, it is probable, always occur—where, but for the fever hospital, our senses would be outraged by the spectacle of the sick, miserable poor, clogging our streets and by-lanes, and dying unrelieved, under circumstances which precluded the possibility of effective relief being afforded. A readier admission into hospital would secure a larger proportion of early cases,—an increased number of hospitals would lessen the distance which the fever patient is carried, and so far lessen the exhaustion, and consequent risk, incurred by the fatigue of removal, —while the increased accommodation made available would lessen the dangers connected with over-crowding, defective ventilation, and a necessarily vitiated atmosphere.

But how much better would it be, if the necessity for fever hospitals did not exist? Such an idea is not Utopian; for, in many places, fever is comparatively unknown, and many likely means are unemployed by which the sanification of our large cities may be, in a great measure, secured. Glasgow, hitherto, has stood proverbial and pre-eminent for the constant prevalence of fever, and the awful extent of its ravages; and I can find no sufficient evidence that its fever hospitals have had any appreciable influence in improving its condition in this respect. Neither have they, as has been shown, sufficiently mitigated suffering, and prevented the loss of human life. These, however, are the benefits they are intended to confer; and for both these objects, it is too generally supposed, they are the most efficient agents, and they, at least, receive the most liberal patronage. Their importance, therefore, has been over-rated, and too much has been expected from them; and, so long as the practice and hygienic measures of our public men, medical or otherwise, are influenced by such impressions—which I humbly conceive to be erroneous, and arising from inexact observations and hasty generalisations—so long will their personal energies and their influence be withheld from devising and carrying into effect other remedies, which are better calculated to *prevent disease*, or at least to overcome those causes which are known to foster its growth, and aid very greatly its extension,—and so long, also, will the general mass of society be compelled to walk in the path of those who fancy that there are certain stereotyped forms, according to which charity must needs work, and who deem it impossible that mankind can ever be benefited except by the adoption of their theories and the employment of their remedies.

It may be said that other remedies are occasionally had recourse to; but I place no value whatever on those superficial measures adopted during the temporary excitement which occurs during times of epidemic sickness. No medical man of experience in the condition and diseases of the poor, whose opinion I have obtained, considers that the bustling proceedings I allude to, in the way of lime-washing, fumigating, burning of old clothes and straw beds, &c., effect any real benefit either in preventing or in breaking the force of the epidemic. On the contrary, they are frequently injurious; and it too often happens, that the irritative cough, severe bronchitis, or other serious ailments which afflict, and mayhap destroy, the fever patient, are fairly attributable to the damp, pungent exhalations which, for many days, come from the sloppy lime-washed walls of his cold, ill-ventilated apartment. These measures may have the effect of allaying the apprehensions of that timid portion of the public who have least cause of fear, by giving colour to the usual newspaper announcements, that "the authorities are fully alive to the emergency, and are adopting all necessary precautions," &c. But when the frequently recurring epidemic has passed away, after carrying desolation to many hearths, there will still remain all the influences which invited its approach and prolonged its stay. Among these, there will still remain that monster-nurse of epidemic and contagious disease, the low unlicensed lodging-house, without regulation or supervision; dirty, ill-managed, ill-ventilated; occupied promiscuously by both sexes, and crowded to an awful extreme by trampers, vagrants, and all those who have no fixed occupation or residence. There will still remain the dark, damp, filthy, and noisome labyrinths of narrow wynds and deep courts, of loathsome cellars and suffocating garrets, shut out from the sun, and impervious to wholesome currents of air, without sewerage, or water supply, or any of those requisites, the want of which in large towns is incompatible with healthy existence. These will still remain; and with them an unfailing nucleus of pestilential and other diseases, which filter through a thousand unperceived channels among the whole community, originating disease, shortening life, and impoverishing all classes and conditions of society.

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Extracts from the Registers of the Royal College of Physicians of London, from 1682 *to* 1749: *By* John Lewis Petit, *M.D., Coll. Regal. Med. Lond. Soc., S.R.S., and S.S.A. Manuscript* 3 *vols., including* 21 *books of the College Annals.* The books are described, and the pages given. Library of the Medical Society of London, *perfect.*

We have, in the last three numbers of our Journal, given the statistics of the medical profession; the present status of the general practitioner; and the position he is likely to occupy if he allow himself to be taken into the custody of the Colleges of Surgeons and Physicians. It will now be our business to place before the general practitioner the history of these corporations, so that he may not hereafter, if he should fall into the trap that is laid for him, have the excuse of ignorance. He should take warning from the past, and be forearmed.

By a most fortunate and opportune circumstance, we have discovered in the library of the Medical Society of London, the three volumes of manuscript above-named. Their authenticity is undeniable; and they fill up a gap in the records of the College of Physicians which we believe would otherwise remain vacant. They were in the possession of Mr. Warburton during the Parliamentary Enquiry, 1834; but, as far as we know, they have never been made public.

Before we commence our review of these annals let us, in a few words, give a brief history of the College of Physicians. The six physicians whose names are recorded in the charter took their degrees at foreign universities. Harvey, and the most celebrated men connected with this college, obtained the foundation of their knowledge in other countries. The charter was granted in 1519 (Henry VIII.), to prevent *ignorant* persons practising medicine and surgery; but this only applied to those persons practising in London, and within seven miles thereof. Previous to this the Bishop of London, or the Dean of St. Paul's, with four Doctors of Physic, licensed for London, and the Bishop, or his vicar-general, were the scrutators of the provincials. This charter empowered the college to make *lawful* ordinances or bye-laws. The corporation consisted of a president, four censors, and eight elects, *as at present*. The former for the examination of the metropolitan practitioners, the latter for the provincial; all self-elected. The candidates were to be "profound, sad, discreet, groundly learned, and deeply studied in physic." In 1688 this college, in an address to its members, expressed its determination that the profession "should not be invaded by the *vulgar, which had been the usual support of the younger sons of the gentry of the kingdom.*" The reader must also bear in mind that the charter stated *that all medical men who practised medicine were to undergo a practical examination, and that this college was spoken of as a "commonaltie."* The iniquitous bye-laws, afterwards passed, rendered the institution one of the most despotic of the "rotten corporations" of the country, as our analysis of these annals will show:—

"Dr. Gideon Harvey, physician to the king, 1686, says, 'This famous conclave is the eldest quack synagogue, consisting of a physic pope or patriarch, and a competent number of medical cardinals, who being grown ancient, covetous, and, through forgetfulness, ignorant, are to govern the rest; and, whenever they are consulted, they are to impose upon the juniors their pretended long experience, which they are to embrace with the same implicit faith the Turks do their Alcoran. But, if refractory, they are to be convened before Il Consiglio Picolo, which is their purgatory, whence they may be received again into the bosom of the conclave; but if, afterwards, they prove incorrigible, the conclave sits upon them, and they are then damned, and utterly expelled, without redemption. Thus, in my time, I have known several poor wretches damned.' "

Dr. J. A. Wilson, in his Parliamentary Evidence, 1834, says (question 1610):—

" I would wish, on many accounts, to have the entire body of physicians in this town really represented in the College; and to avoid all heart-burnings and jealousies, and possible canvassing among friends for the purposes of election, I would wish, as much as possible, to do away with all analogy between the College of Physicians, *and the clubs in the neighbourhood of the College.* 1611. What clubs do you allude to?—The clubs generally of the town. I should wish to do away with all exclusive distinction of the fellows that was not founded on medical attainments and general character. 1612. Does the statute still exist requiring a person, before he becomes a candidate or fellow, to call upon the president, and each of the fellows resident in London and seven miles round it?—*It does*; befores he applies to be examined as candidate, or inceptor candidate."

But let us beg the especial attention of all who are desirous of rescuing the profession of medicine from its present state of degradation, to the laws of this college, which now remain in full force; and in the new charter (Parliamentary Evidence, 1848) it is proposed to abolish all other charters, *except that of King Henry the Eighth.* We copy a few of these laws sent to the Medical Directory, 1851, by the College of Physicians. " The college is entitled by charter to prevent any one from practicing as a physician in London, or within seven miles thereof, who has not submitted to its examination. No fellow or licentiate may consult, in London or within seven miles thereof, with a physician who does not belong to the college, under a penalty of £5. The president and court of the college have the power of committing individuals *contemning their authority to Newgate; and this power has been exercised by the Court, but not of late years.*" We deny the *legality* of this as regards members of the Apothecaries' Company, who undergo a more useful and practical examination than that instituted by the College of Physicians; and who are privileged to practise medicine in *any* part of England south of the Tweed. But for the proof of the superiority of the examinations at this college? Dr. James Johnson, Parliamentary Evidence, 1834 (question 3646), said—

" That he underwent three examinations (for the licentiateship) at the College of Physicians, which did not last altogether *twenty-eight minutes*—that these examinations were *no test at all.*—Sir James Clark (question 3681) said his examination, he thought, lasted *considerably less than half-an-hour*; and that the examination afforded no test of his being well or ill-qualified to practise medicine.—Dr. Neil Arnott (question 2427) stated that his examination was *very limited.* No mention was made of midwifery; and he believed there never was any."

The reader must remember that the licentiates of Pall Mall may meet in consultation, mesmerists, homœopaths, hydropaths, chrono-thermalists, et *id genus omne*, without fine or censure; but a physicain, who may have ten times the talent and practical knowlege of a licentiate of this college, must be avoided as an *incapable.* The reader must also recollect that a man may be a physician without belonging

to one of these clubs; they *did* exist in France, but they were replaced by a *National* Faculty of Medicine, the very basis of which is election by *concours* and public competition. The celebrated physicians and surgeons, anatomists, physiologists, pathologists, pyscologists, zoologists, and botanists, whose names adorn the annals of France, prove, beyond dispute, the superiority of the system, and the benefits it has conferred upon medical science, and upon suffering humanity, in all parts of the world. We now take the reader from this, the year of the Great Exhibition, 1851, to that of 1682, when these annals commence.

We first give the number of *socii, candidati, permissi intra urbem,* and *extra urbem,* which were admitted from 1682 to 1749. The names are all mentioned, and the rejected candidates stated. Some of the disclosures are highly amusing, and would never have been made public by members of the college. They are too politic to foul their own nest.

" *Socii* from 1682 to 1748, admitted 123. *Candidati* (all from Oxford and Cambridge), from 1682 to 1749, 125. *Permissi intra urbem.* From 1682 to 1749—99. *Permissi extra urbem.* From 1682 to 1792, 143." The candidati and permissi often became socii, so that these numbers must be considerably reduced. It must also be borne in mind, that these were the only persons legally qualified to practise medicine in England up to 1815, and that this College, and the College of Surgeons, in 1815, not only refused to examine the general practitioners, but, according to the Parliamentary evidence of Dr. G. Man Burrows, 1834, (question 252), the opposition to the establishment of the Apothecaries' Company was *entirely confined to the Colleges of Physicians and Surgeons.* Dr. G. Gregory, in his Introductory Lecture at St. Thomas's Hospital, in October last, says, " So little was medicine thought of in London, that in 1814 the total number of medical pupils attending the seven metropolitan hospitals was only thirty-eight." What a dark and gloomy retrospect is this. We ask the reader to pause awhile and contemplate the effect of these exclusive and unjust laws on the duration of human life, and on human suffering.?

Learning and Erudition.—The annals disclose a great amount of pedantry and ignorance. Bad grammar and spelling are abundant, and such a jumble of dog's-latin—such an attempt to dovetail Latin and English was never seen; e. g. " Dr. Woodard read a lecture on the *bilis*—or any other disease of the *venter.* Mr. Peachey, Dec. 7, 1688, continued spargere chartulas, and his board over his door.—Audit Aug. 1746, Accepta, £753 5s. 4d. Expensa, £528 2s. *Ballance,* £225 3s. 4d." The last word is always used. In the present Latin Pharmacopœia, 1851, we have *Johannes* Churchill, *Princes Street, Soho.* " April 6, 1688, Glauber's works in *English* were not approved of by the censors, to be licenced."—" March 18, 1692, College Register kept in English by the advice of the council, because by reason of the variety of stiles in latin, and the uncertain acceptation of many latin phrases, the Rigister book would not be of any use to the college as a record upon many occasions, as if it were kept in English, and in the plainest words it could be."

"*Statutes, Laws, &c.*—June 26, 1682. Sancitur ut Sociorium Collegii regalis Medicorum Londinensium necnon Candidatorium, Scociorum, Honorariorum et Permissorum nomina Typis protinus mandentur, Lucrum vero Bedello detur." This said beadle was, like all beadles, a *very* important personage; he delivered the summons, and looked out for illegal practitioners.—"Sept. 11, 1696, several of the statutes translated into English, and several alterations made in them by the council, and some new statutes added, and were read by Mr. Swift (the attorney), and passed."—"July 1, 1689, an order of the House of Lords to return the names of such members as are papists, reputed papists, or criminals." The criminals returned were Drs Grey and Elliot, and their criminality probabably consisted in disobeying the laws of the college. A promise to add to the bill by a committee of the House of Lords, that all members of the college should take the sacrament according to the Church of England. This being a surprise to the college unlooked for, the college committee are desired to take all care they can about the affair.—A petition to the law officers of the crown, January 26, 1697, from Drs. J. Clerk, Blackmore, Bernard, Stockham, How, Gibbons, and Pitt, complaining "that the prevailing party of the college had combined together, and in a fraudulent and surreptitious manner made illegal statutes or bye-laws, and annexed rigorous penalties, fines, and amercements, contrary to the charter of Charles II." The copies of the charters and bye-laws were ordered to be laid before them, but kingly favor and aristocratic influence were always in favor of the college.—October 8, 1697, "The president is ordered to inform himself who is clerk of the lieutenancy, and to give him a catalogue of the names of members of the college, and to present him with a guinea."—December 16, 1697, an address to William III. from the president, from which we extract the following:—"By a steady and invincible courage you have surmounted such difficulties and performed such actions, as no former age could equal, and posterity could scarce believe. But in a more peculiar manner it becomes this our society, which owes its being to your royal predecessors, and the privileges it enjoys to your Majesty's favor."—"Dec. 22, 1701, the president (Sir J. Millington) after much solicitation, by his prudence and winning manner of address to the Earl of Radnor and Mr. Bolter, got the sum of £7,000, owing to the executors of Sir John Cutler, remitted to the sum of £2,000, which he himself, without the knowledge of the college, generously laid down, and afterwards took only this bond of the college for that sum, by *which means he redeemed the college, and gave it a prospect once more of future prosperity*." The doctor, it is said, should live in the annals of the college to all future generations." "Dec. 22, 1703, The præses natus, with six other electors, withdrew into the censors' room to chuse a new president instead of Sir J. Millington, deceased, for the rest of the year." "Dr. Collins's book in latin subscribed for by several. A physician to Christ's Hospital chosen." "Feb. 25, 1701, a petition to Parliament by the graduates of Oxford, that they might be admitted to the college without examination by the censors." This, of course, was opposed.—"In 1702 a paper of grievances was sent in by thirteen members of the college, complaining that their unjust laws kept many worthy practisers of physic from the college, whereby our debts increase, without prospect of remedy, and our body diminishes, without hopes of repair, &c." The petitioners also complain that not only the fellows but the censors themselves are denied the view of the statutes and register."—The proposal mentioned in the foregoing paper of grievances, requiring that the president should hereafter be obliged to propose any matter whatsoever to the college, if requested so to do, by any ten of the fellows,

being debated, was rejected by all but one."—"March 10, 1700, all members of the college were desired to be present at the trial (at the bar of the House of Lords) of Rose, the apothecary, for practicing physic, and in the meantime to *solicit* with the lords they knew on behalf of the college, and solicit them to be there." *These are the words in the letter addressed to each*. The Lords, however (contrary to the expectations of the bystanders), reversed the judgment of the Court of Queen's Bench, thus ruling that an apothecary in 1700 was legally qualified to practice physic; in other words, as at present, to act as a physician.—"April 7, 1707. All statutes, except those contained in the old book in Latin, to be abrogated."—"March, 1708. That the library shall be free to all members of the college. That no candles be brought into the library, or any to have liberty of *smoking tobacco there*."—"Dr. Chrichton (1700) refused to pay his dues as 'licentiate,' because he did not think the statutes good, because the licentiates were not concerned in the making them, and therefore he was not obliged to pay. The president told him that no licentiate *ever was, or ever ought to be, present, or to have a voice in the making of any statute*." A month was given to Dr. Chrichton to consider of the matter, and give his final answer.—"Dr. Flemming (1710) also refused to pay his quarterly dues, unless he were admitted to the board of the fellows, to make statutes.—May 7, 1711, Mr. Swift ordered to draw up an instrument to oblige all the college members, under a penalty, not to consult with any persons not of the college.—The penalty here named is £40. 1711, The library being supervised, was opened to the members." It is *now* closed to them.—October 1, 1711, "Ordered that all licentiates, previous to their admission, give a bond of £50 before their admission, to pay the quarterly dues to the college.—The president gave the college the choice of 2s. 6d., or two pair of gloves, for Dr. Hamey's gift." They took the gloves.—June 12, 1713, Statuimus et ordinamus quod nullus in posterum licentiatus sive permissus ad praxim medicinæ in hac urbe admittatur, nisi prius septuaginta libras legalis monetæ Magnæ Brittanniæ Thesaurario hujus Collegii pro tempore existento, in usum ejusdem solverit et quascunque alias sumas p. statuta Collegii tempore permissionis debitas, vol ii., p. 24.—"The president Aug. 20, 1713, communicated to the board that the regular doctors of Norfolk and Suffolk were endeavouring to get an Act of Parliament for the better regulating physic."—"A circular was again sent to the bishops, desiring them not to licence without testimonial letters from the president and the elects. A catalogue of members to be sent to each vestry, but the abode of the members to be omitted.—Feb. 19, 1713, Ordered, that practice be taken against all illegal practisers of physic.—Jan. 13, 1715, Ordered, a guinea to be given to Mr. Hamlin, Mr. Jodorels, chief under clerk in Parliament, to give us notice of anything passing in the House of Commons relating to the College of Physicians.—Dec. 4, 1719, The college kitchen to be made ready for entertainments in the college.—1720, The registrar drew up a form for subscribing towards the college repairs, &c.—Mr. Knaplock gave £200 for printing the College Dispensatory, a royal license to be obtained to prevent translation. The dispensatory, as before, to be inscribed to the King (Charles II.)—April, 1721, Dr. Bainbridge (who had often been summoned in Latin) for contempt, to be discommuned, and all penalties for non-attendance to be strictly exacted.—A complaint against the beadle, for not summoning an old woman for malapraxis, who said she valued not any physician in London; God had given her a gift, and she ought to make use of it.—Dec. 22, 1721, A letter to the universities, telling them to be cautious in admitting Doctors of Physic.—Feb. 22, 1721, Mr. Dover was summoned for neglecting a moral statue. The immorality consisted in refusing to meet a Dr. Wagstaff, whose patient he directed to be blooded to 40 oz. It was decided that he had transgressed the *moral* statutes, but he was admonished, not fined."—Fee morality appears to have been the *cardinal* virtue.—"April 8, 1723, Only two licentiates present; penalties to be levied on the absentees.—July 5, 1723, Mr. Mead ordered to seize the effects of the college tenant, Stokes, for payment of arrears.—August 4, 1723, Resolved, that licentiates for the future shall have the liberty of compounding for their annual payments for ever, at the time of their admission.—April 10, 1724, a committee for promoting the bill now depending in Parliament. Thanks given to the president and others, *for speaking to the bill before the House of Lords.* Dr. Eaton obtained permission for the exemption of his Styptic from the view, search, &c., of the censors." *Thus a direct encouragement was given by the college to quackery*, (vol. ii., p. 28.) "The Lord Chancellor (Macclesfield) thanked for inserting two clauses in the bill for making the judgment of the college for fine and imprisonment *final.*—Dec. 22, 1725, That the statute relating to honorary fellows be repealed.—June 7, 1728, That no member of the college shall meet the Rev. Mr. Johnson, who practises physic about London.—April 3, 1732. Forty guineas to be given to Mr. Mead, for soliciting the bill.—Sept. 30, 1736, The usual present of 60 oz. of plate to the president, not being finished by the workmen, could not be presented on this day as had been customary.—April 12, 1742, Dr. Sarmento to be expelled the college if he did not pay his quarterage.—June 25, 1741, the president proposed that for the future M.D.'s of Oxford and Cambridge, who were licentiates, should be excused the trouble of visiting the fellows, and should be admitted without examination or further payment.—March 29, 1708, Stokes, the college tenant at Ashlyne, to keep no dogs, nets, nor other engines for destroying game. No game to be destroyed on the said manor save for the use of the president."

Bequests, donations, and subscriptions.—It must be borne in mind that this college, up to *the present time*, has *only been supported by the subscriptions and donations of its fellows;* but as they have derived a *direct* pecuniary advantage from the medico-apothecary system, the money, on their part, has been profitably spent. Dr. Baldwin Hamey, May, 1672, gave his estate to the college, on condition that two fellows of the college should be nominated to fill all vacancies that occurred at the three royal hospitals. That the orator should have £5, and the president, elects, and fellows, who were present, one pair of gloves each (there were no *censors*, we suppose, at this time). But here comes the remarkable gift:—"The president of the said college, from the time being, shall successively be presented with a piece of silver plate, of above threescore ounces, by the treasurer." It will be our business, as public journalists, hereafter to enquire how far these bequests have been complied with, and whether as, in the case of the recent Swiney Cup, adjudication to Dr. Paris by the office-bearers of

the college, Drs. Nairne, Monro, and F. Hawkins, there may not have been an irregularity that may *invalidate* the whole proceeding?

Imprisonment, fine, persecution, &c.—No Chinese mandarin or eastern despot ever exercised more tyrannical power than the president and censors of this college have done. Doctors of medicine, apothecaries, chirurgeons, (*"Betsy Gamps and Sairey Harris's,"*)—the learned and the unlearned, were all summoned before this medical inquisition. Dr. Groenvelt (1694), a *licentiate* of the college, was accused before the censors by ignorant women of giving cantharides, to the injury of the patient, whose case was investigated. The doctor, these minutes say, "behaved himself with great confidence, said he had cured many that had been in the fellows' hands, and threatened to write a book against them." The censors made out their warrant, and committed him to Newgate. A Habeas Corpus was moved for, and he was discharged, the Attorney-General ruling that his crime was within pardon of the King; the judges also agreeing that the college might impose a fine, and imprison until the fine was paid. The doctor brought an action against the censors, but soon after paid two shillings for being absent last college day, promised obedience, petitioned for a charitable gift to him in prison, and it was left to every man to give as he pleased."—Mr. Peachy (1689), refused to pay the £4 he was fined, whereupon he was fined £8 for his second contempt. Dr. Peachy refused, the trial came on at Guildhall (July 20, 1602), and the college was nonsuited, because the book of statutes, ordinarily so reputed, was not *dated*. The Lord Chief Justice advised that the college statutes should be confirmed anew."—Dr. Radcliffe, for absenting himself from the college 26 times, being legally summoned, and for his contemptuous slight of the college comitia, was expelled, and declared non socius;—whosoever henceforth consulted with him, it should be *sub pœnâ decem librarum.*" Vide comit. extraord.—Dr. Baynard being summoned, came to the censors' board, April 7, 1693, left the following letter:—"Mr. President, I am a gentleman, and no footman; so do not understand waiting beyond the time of your summons. If you or the censors have any further business with me, you must send a further summons, and be more punctual to your time than in this, otherwise I shall not obey it. I am, as you please, your's, or not your servant—Edward Baynard." We insert this letter, as showing an extraordinary instance of independence in these days of sycophancy and servility.—"Dr. Nicholson, 1693, the senior candidate, desired to be admitted a fellow, but was refused, because he had not visited the fellows. Dr. Cole appeared, (March, 1694), and acknowledging that he read an anatomical lecture in Surgeon's Hall, without leave from the president, the censors declared him guilty of breaking the statute *de anatomica administratione*, and fined him accordingly."—The college game was to keep all in greater ignorance than themselves. "May 8, 1694, An advertisement ordered to be inserted in the 'Gazette,' that complaints having been made to the censors' board against illegal and ignorant practisers in London, and seven miles' compass, all persons, or their friends so aggrieved, might apply to the censors the first Friday in every month, in order for the punishment of such offenders."—"April 7, 1707, Joseph Thompson, ordered to be arrested at the suit of the college."—"Oct. 8, 1707, Mary Clark, in Bunhill-fields, next door to the 'Sun,' came to complain of Elizabeth Pratt, in Blue Anchor-alley, that she gave her physic from the middle of July to the beginning of October, for obstructions, particularly vomits, and says she is an ill woman."—"Elizabeth Pratt ordered to be summoned for next Friday. The case was heard, and the censors were unanimously of opinion that Elizabeth Pratt was guilty of mala praxis in not well using the Faculty of Physic, but deferred the punishment to another time. On the 23rd of February the censors' warrant was made out, and Elizabeth Pratt was committed to Newgate for 12 weeks. She sent, however, a humble petition to the president, and was released after four weeks' incarceration."—"Sept. 11, 1711, Christopher Barker committed to Newgate for 12 weeks, for endeavouring to salivate Thomas Gillet, although the prisoner did not appear before the censors." The censors' warrant to discharge him may be seen, fol. 275, former register.—"Jan 3, 1712, Mr. Barker, nephew of the above C. Barker, acknowledging his contempt and ignorance of the laws, in depending upon the license from the bishop, praying to be discharged from his imprisonment, and that his fine may be remitted. The consideration of this petition was deferred by the censors."—"Nov. 1713, Dr. West having been arrested for illicita praxis, came to the censors' board, and demanded to be admitted according to the statute of Henry VIII. The president *was ready to give him leave to visit, in order to examination*, and to be admitted as others had been. Dr. West resisted, and a subscription was entered into by the members to defray the charges of the suit against him."—1698, John Hobbs, an apothecary, was complained against by Mrs. Powell, for mala praxis, but did not appear at the censors' board. The said Hobbs was discommuned, and the members of the college forbid to send their bills to him on pain of penalty."—"April 12, 1712, Mr. Hunt, the apothecary, prayed that the prosecution by the former censors might be taken off; his submission was accepted, on paying the charges."—"Mr. Butler to be summoned in latin. Mr. Butler appeared, and behaved himself too pertly; he was told that he could not practice without a license."—"June 5, 1730, Ageron Fabricius to be summoned, but he went beyond the seas, and put himself under the protection of the foreign ambassador." These are a *few* only of the cases.

Examinations and Rejections during these 67 years. Kings' physicians found a ready ingress provided they would pay the money. "In 1717 the Duke of Montague was proposed, balloted for, and elected fellow, having been admitted Doctor of Physic of Cambridge when King George was there. The fellows resolved to go in their gowns, and admit him *at his own house*. In 1728 the Duke of Richmond was desirous of being admitted a fellow. He was balloted for, and elected at his own house, like the Duke of Montague. Dr. A. Stewart, in 1728, was admitted a member and fellow (as Queen's physician) without examination; and several others enjoyed the same privilege. In 1687 Dr. Clench was restored to his fellowship on his petition and submission, and upon the Lord Chancellor's *request*."

Candidates.—"Dr. H. Chamberlen was admitted 1689; but admonished to apply himself more diligently to the therapeutic part of physic.—Dr. Adams, 1694, refused to have his diploma written upon the parchment stamp; but the president thought the hazard of the £500. penalty would be too great.—Dr. Joseph Brown, 1697, gave no satisfaction, neither

to the president nor censors, and therefore was rejected.—Dr. Hannes passed his examination 1697; but not coming to be admitted for a year, all the members of the college were forbidden to consult with him." The candidates had usually been *created* Doctors of Physic of Cambridge or Oxford, and *generally* not examined by the College of Physicians.

Permissi intra urbem.—"Mr. Twill, 1688, brought his admission from the Apothecaries. He was admitted, but told he would be expelled if he sold or dispensed physic to *any other patients than his own*.—Mr. Turberville was admitted 1684, but in the opinion of the censors was very indifferently qualified; but he promised *to go into Wales for some years before he practiced in London*.—Dr. Eaton, 1713, was advised to pursue his studies sometime longer.—Dr. E. Brown, 1721, was admonished by the president to behave himself towards the Faculty with respect and without reflections. He was admitted.—Dr. Thomas Butler, 1722, examined in physiology. Upon consideration of the favor granted him to be examined in English, the censors put to him a chapter in Galen in Latin, *de usu partium*, which by statute he ought to have read, but could not construe it, then proceeded in an English examination. Upon the whole the censors could not approve of him; and the president acquainted him therewith, and forbid him practice according to statute.—Mr. Bamber, 1724, was admitted, but disfranchised from the Barber Surgeons' Company."

Permissi extra urbem.—"George Lamb, Esq., of St. John's College, Cambridge, 1709, "answered extraordinarily well," and obtained letters testimonial from the *elects*.—Mr. Buck was not approved.—Dr. Bayley, 1720, gave great satisfaction; and his licence was sealed by the president and three elects.—Mr. Owen, 1720, was examined in English, and told to appear again when he felt himself stronger."—Messrs. Johnson, Bushby, and Green, 1723, 1724, 1734, shared the same fate. The expression, "bred an apothecary," is constantly used in describing the men of this grade. The above are the only rejections we find during this period of 67 years.

Sept. 30, 1697. "In the balloting of Dr. Goodall (for censor) *there were two balls more than there were fellows*, and those in the negative. The president, abhorring the baseness of such an action, ordered the beadle to deliver to every fellow one ball only;" *then* Dr. Goodall had the majority of votes, and was elected."—Dr. Henderson, Parliamentary Evidence, 1834, question 3317, stated that Dr. Mason Good told him that, after his rejection *by ballot* by the examiners, 3 out of his 5 examiners called upon him and expressed their regret and *astonishment* at the event.—Comitia Censoria, Dec. 6, 1689, "Mrs. Wolveston came to have our hands to her being a licentiate in midwifery. She was examined, and modestly and prudently answered to satisfaction.—John Davies, servant and son to R. Davies, an apothecary, was examined and approved.—Dec. 18, 1696, Mr. Gery, an apothecary, refused a certificate to recommend him to Greenwich Hospital because he did not come to be examined when he first opened shop.—April 3, 1699. Dr. Hanns having been examined a year since for candidate, and having *leave given* to visit the fellows, which he did not, nor took any notice of it, but continued to practice still in London, the president forbid all the members of the College to consult with him upon penalty of the statutes."—Dr. Tomlinson appeared and alledged that "he had been examined and approved by the president and censors, but that he was not admitted for some reasons unknown to him. The censors' book was called for, and it was recorded *there* that he had been examined but not approved."—Nov. 1, 1700, That Doctor West, a Doctor of Physic of Oxford, to be prosecuted at law for practising physic in London.—Dr. Levet (Dec. 20, 1701) promised to appear at the censors' board to be examined; but would not promise, as they wished, in the name of a gentleman, not to practice in that time, telling them that if they took him practicing he would pay the penalty. —Sept. 21, 1708, Dr. Slare was called in, and being before chosen an elect, was examined. The president asked him "*Cujus es?*" He answered "*Angus, ex agro Northamptoniensis.*" He was examined by the rest of the elects present, and gave his faith to the college.—Nov. 3, 1721, Dr. Brown offered to pay £25. down for his diploma, and the rest in two years. He was balloted for, and admitted a licentiate, having agreed to pay the balance in one year—Dec. 1, 1721, Mr. Thomas Butler desired to be examined in English for the licentiateship. His request was granted; but he was rejected, and interdicted from practice. The president, in relation to this examination, stated two instances of examinations (intra urbem) in English. It was decided that none for the future should be examined but in Latin, *without the consent of the college.*—Dr. Butler again examined, and a chapter in Galen put to him, which by statute he ought to have read. He was forbidden to practice.—March 2, 1722, Dr. Hulse being absent at the censors' meeting examined Dr. Bainbrigge, M.D., D. Cant. and Samuda, at his own house, and reported his approbation. Dr. B. had been repeatedly summoned and discommuned. The discommuning revoked. Oct. 19, 1724, "Dr. Campbell examined as an honorary fellow, as proposed by the president; also Drs. Massey and Middleton."—March 2, 1730, Mr. Young visited, in order to be examined as a licentiate in English. *It was taken notice of* that he had been bred a surgeon. He was advised by the president and censors to be examined as an extra licentiate.—Dr. Schomberg, M.D., Cantab, Dec. 1, 1749, called in and questioned. The president asked the three censors whether the Dr. had given proper satisfaction? The censors were not unanimous, and nothing was resolved; but the majority thought he had made proper satisfaction (vol. 3, p. 14). Dec. 22, Moved and carried that the resolution respecting Dr. Schomberg be recalled. Feb. 2, 1750, Dr. Schomberg examined in physiology, in pathology, was approved, and told to come next censors' day. Two of the censors out of the three declared him qualified; but Dr. Battie did not think him, upon the whole, "*Idoneus qui admittatur in numerum candidatorum.*" Dr. Battie appears to have spited him from the beginning. "The sense of the college was taken by ballot; 15 balls were against the Dr., and 2 in his favor."

Bishops.—In 1687 a letter was sent to all the bishops not to licence any practisers of physic without the college recommendation, in which are these words, "We thought it our duty to inform your lordship than in a statute made 14th & 15th H. VIII., c. v., the power of examining such persons as take upon them to practice physic was given by the statute of the 3rd of H. VIII., c. 11, to the bishops in their respective dioceses, or, in case of their absence, to their vicars-general, is transferred to the president and 3 elects of the College of Physicians, who are to examine the said persons at London, and to

give them letters-testimonial of their approving and examination of them before they can by the bishops or their vicars-general to the practice of physic, &c." At the present time, 1851, there are 8 or 10 "*divine*" doctors; that is, created by bishops! and a man who buys a foreign degree of a London wine merchant, for £40., may be admitted to examination at the College of Physicians!

But the reader will naturally ask what are the *present* laws of this College? The annals will tell him that they gradually became more tyrannical and arbitrary, and the President and Censors say in the "London Medical Directory," for the *present* year, that they have the power of committing individuals *contemning their authority* to Newgate. Lord Mansfield (1767, R. *v.* Askew) spoke of the *illegal* bye-law which restrained the number of fellows to 20, and "he considered the words *socii*, *communitas*, *collegium*, *societas*, or *collega*, as synonymous terms." But let us give an example now before us, of the effect of this Charter of 1519 upon our medical institutions, and of the baneful influence of corporate power, upon hospital appointments.

We have stated before that nearly all the London hospital appointments are obtained *indirectly* by *purchase*. Mr. South, in his recent Oration at St. Thomas's Hospital, said, that "no instance had occurred in the history of the hospital of the election of a surgeon who had not *been an apprentice.*" In 1843 an hospital was commenced at Paddington (St. Mary's). It was understood, at the formation of this institution, that one especial feature in its management would be the election of the medical officers by *concours*, or public competition; and, according to the laws, 1849 (page 59), it is said:—

"The weekly board shall refer all the candidates legally qualified for the office, and of whose respectability of character they are satisfied, to an examining board, and such board of examiners shall consist of not less than five, and not more than nine, competent persons, to be chosen by the Medical Committee, subject to the approval of the weekly board. The examination shall be open to the attendance of the Governors of the Hospital, and shall consist—1, of written replies to questions in writing; 2, of *viva-voce* examinations; 3, of clinical demonstrations; 4, of demonstrations on the dead body; and 5, (in the case of an examination for the office of a Surgeon or Assistant-Surgeon,) of surgical operations on the subject.

"The board of examiners shall select, after due examination, the three best qualified competitors, if there be five or more, or the two best, if there be less than five, and the names of the selected candidates shall be sent back to the weekly board on separate cards, without comments, unless under circumstances of distinguished merit, when it shall be competent for the examining board, with the consent of a majority of not less than four-fifths of its members, to report specially thereon. In case there should be only one or two candidates, the examining board shall report the result of their examination of such candidate or candidates."

On the 5th of July, 1850, a special committee was formed for the election of medical officers, and it was recommended to the weekly Board to adopt the following plan:—

"That a Special Committee, to consist of nine non-medical Governors, be appointed to recommend to the weekly board, for election by the open votes of all the Governors, persons to fill the offices of the three senior-physicians, the three senior-surgeons, the physician-accoucheur, the surgeon-accoucheur, the ophthalmic and the aural surgeons."

After this the special committee was to advertise for assistant-physicians and assistant-surgeons, to examine testimonials, and to recommend to the weekly Board the persons they thought best qualified. The physicians *selected* and *elected* were Drs. Alderson, Chambers, and Sibson; the surgeons, Messrs. Coulson, Lane, and Ure. Then came the selection of the names of assistant-physicians, and those recommended were Drs. Markham, Sieveking, Jones, and Miller. The medical staff committee added the name of Dr. Lankester, but the special committee left out his name on the ground of his non-qualification, and the committee were supported by the Board, the numbers being 36 to 21. Dr. Miller retired from the contest, and the three assistant-physicians, as there was no contest, walked over the course—one of them we saw (May 9th) vote for *himself*; he held up his hand against the addition of other candidates to the list; an exclusion which, of course, made him a physician to the hospital. *So ends election by concours at St. Mary's!* But not so our illustration. A Mr. Heale, a licentiate of the College of Physicians, has thought proper to enlighten the governors, (whose suffrages he *would* have solicited,) with a letter, of which the following choice MORCEAU is a specimen:—

"A most outrageous insult has been offered to the medical profession, and to the governors at large, by the recommendation of a gentleman to fill the office of assistant physician, who possesses no legal qualification whatever, but who at this moment is under sentence of unfitness from the only body authorized to license physicians to practise in London,—viz.: the Royal College of Physicians,—and who is guilty of the disrespect of our Sovereign of claiming the rank of M.D. on the strength of a worthless German degree, in opposition to and contempt of Her authority, from whom alone all honour in England properly emanates."

We are neither acquainted with Dr. Lankester nor with Dr. Heale, but we have *always* been advocates for election by *concours* and the substitution of *national* institutions for *private* clubs. Dr. Lankester is an extra-licentiate of the College of Physicians—*that is, he may practise* (according to the College edicts) *at Richmond, but not in St. Giles's;* he is also an M.D. of Heidelberg by residence and examination, a Member of the College of Surgeons, and a Licentiate of the Apothecaries' Company; late Senior Physician to the Farringdon Dispensary, and a Lecturer on Materia Medica at the St. George's School of Medicine; the author of several medical works, and he obtained honours in ten of the classes of University College. In 1847 he presented himself for examination for the London Licence of the College of Physicians, and was rejected (we quote from his published account of the transaction). One of his examiners, six years before, had given him a certificate stating "that he would fill the office of physician to a Dispensary with credit to himself and much advantage to the objects of the institution." Another of his examiners was a lecturer at a rival school. It will be observed that Dr. Lankester's diploma from the Apothecaries' Company gives him a *legal right* to practise medicine in London. An *illegal* practitioner who *buys* his diploma at the College of Physicians of Edinburgh is eligible! Although comparisons are odious, we express our belief that Dr. Lankester is superior to the three assistant-physicians who have obtained the appointment. It is corporate influence that has effected all this; and, as we stated in our first number, it never showed its brazen front with such unblushing impudence as at present. The reader, with a particle of common sense, must see the connexion of the "Annals" with this *job* at St. Mary's. The general practitioner must be dull indeed, if he does not comprehend its bearing, upon *his* future position.

In our next we give the histories of the College of Surgeons, and the Apothecaries' Company.

The Histories of the Colleges of Physicians and Surgeons, and of the Apothecaries' Company (continued).

'Tis a matter of life and death, Lawrentio;
A stage, where men have played strange parts,
Brought grades and fashions to the sick man's couch,
And made a map of science to suit their *pockets!*—OLD PLAY.

Our picture of the College of Physicians would not be complete if we did not add a few modern tints, and place some of the present actors in the foreground. The reader is especially requested to keep his eye on the dark shadows of the picture. The regal forms of Henry VIII., James I., and Charles II.,—the ballot-box—the metropolitan line—the iniquitous bye-laws—making this college a *club*, and not a *national* institution;—a corporation that has been kept in existence only by the private subscriptions of its fellows.

Wilcock,* in his Laws of the Medical Profession, 1830, pp. 36, says, "This college is, to a certain extent, a private body. It was instituted in a reign during which patents of monopoly and exclusive privileges were daily granted, and more frequently for the purpose of replenishing the exchequer, and *enriching individuals by the profits of the monopoly, than in consideration of the public welfare.*" It must be recollected that the simile made by Dr. J. A. Wilson, in his Parliamentary evidence, between "this college and the neighbouring clubs," is scarcely applicable, for at the neighbouring clubs a man is balloted for *once*, at the College of Physicians twice; first by the censors, and secondly by the fellows. Dr. Hastings, of Albemarle Street, in 1846, was elected by ballot by the censors, and afterwards rejected (by ballot) by the fellows. The doctor, however, called a meeting of the college, and the third ballot made him a licentiate. These were not the laws made 330 years ago, but the edicts of a *clique*, whose exclusive acts, and illegal proceedings, appear to have increased with the dawn of science, and the spread of knowledge.

Harvey, and Drs. Bonham, Wells, Burgess, Wright, Stanger, and others, were badly treated by this college. Sydenham was denied the fellowship. Drs. Armstrong and Mason Good were rejected, and Jenner was refused their licence. The Dukes of Richmond and Montague were made fellows at their own houses, the fellows going in procession in their gowns! Jenner told them that at his time of life, to set about brushing up Greek and Latin, would be irksome in the extreme; but, said he, "I wish you would frame a bye-law for admitting men among you who would communicate new discoveries for the improvement of the practice of physic. On this score (not alluding to vaccination) I could face your inquisition with some degree of firmness."—*Baron's Life of Jenner.*

In the first volume of the Examiner (p. 123) we have inserted the names of nearly 200 distinguished members of our profession; and it will be

* We are indebted to this writer, and to Kennedy, on Medical Monopolies, for some of the information in this article.

seen that those whose names are in italics were in general practice, and were by far the most celebrated. In the Appendix, page 39, the Oxford and Cambridge graduates, practising in London, are contrasted with those physicians who have taken degrees elsewhere. The reader, on perusing the names, will, we believe, think with us, that the comparison is greatly in favor of the latter, although the Oxford, Cambridge, or Dublin graduates, have invariably been elected as censors and examiners for the London licentiates. The subject is too important to allow us to avoid the comparison, although it may be odious to many; if we were a member of the College of Physicians we might be fined for a breach of a *moral* statute!

For further information respecting the prosecutions of the College of Physicians we refer the reader to the Annals, and to Wilcock's Laws of the Medical Profession, 1830, where the trials of Goddard, Archer, Letch, Askew, Fothergill, Stanger, Schomberg, Levett, West, Bonham, Rose, Gardner, Tenant, Butler, Basset, Bush, Talbois, Salmon, Huybert, Needham, and others, are given. But the last, and most important trial, took place in 1828. Dr. Edward Harrison, a graduate of the University of Edinburgh, where he had passed a better examination than that instituted by the College of Physicians, was practising within the sacred circle as a physician. He was written to by the censors, who told him that they acted under their charter, Henry VIII., confirmed by Parliament. The doctor, in his reply, said, "that the title of censors was not mentioned in the charter, nor was anything said about the examination of graduates of universities, nor of fellows and licentiates;—that the boast of the college was a mere brutum fulmen!" Dr. Harrison also spoke of the duty he owed to his Alma Mater, and "pledged himself to defend the action on *public* grounds, and for the advantage of our common profession." The doctor's magniloquence, however, vanished at the trial; and persuaded, we suppose, by his lawyers, he deserted the main question, for it was pleaded that he practised as a surgeon in the case of Miss A., who had a spinal affection; and by this means he obtained a verdict in his favor. If Dr. Harrison had advocated his own cause, and laid bare this iniquitous medico-apothecary system of club-laws and boundaries, he might have lost his action; but he would have hastened the establishment of a representative Faculty of Medicine, and he would have stood better in the estimation of his brethren. Dr. Harrison had no legal right to practise medicine in England. If he had been a member of the Apothecaries' Company, the College would not have dared to have brought the action. It came out on this trial that Drs. Baillie, Warren, Paris, and Turner, had met Dr. Harrison in consultation, and that *three* of them had been called upon to pay the penalty imposed by this bye-law (Wilcock, p. cxxx.) We are unable to state how the expense of the prosecution was paid; but probably, as on former occasions, by a subscription of the fellows.

Complaints among the licentiates of this college, and the physicians unconnected with it, have been numerous; but such is the power of aristocratic influence and club-law in England, that the men who have taken a leading part in medical reform have always suffered both in pocket and position. Our legislators, moreover, who have generally

been connected directly or indirectly with the so-called aristocracy of the country, have treated the *most important matter* that could come before them—*one of life and death*—almost with indifference. *They* could obtain what *they* considered good medical attendance; and might have the consolation, before their dust was mingled with the peasants', of having their pulses felt by a fashionable attendant within the sacred circle.

In 1832 a long petition, signed by British physicians, was presented to the House of Commons by Mr. Hume. The petitioners complained of the illegal acts of the College of Physicians, and they were *innocent* enough to hazard this conclusion:—"It would *greatly distress* your Honourable House to add to this statement *the probable amount of lives prematurely destroyed, and the aggregate mass of affliction which, during these* 300 *years, have proceeded from the culpable inactivity and carelessness of this college.*"

In 1833 another petition was presented by 50 licentiates of the College of Physicians practising in London. Among the names are those of Drs. Marshall Hall, Forbes, Locock, Copland, Holland, Gregory, Southwood Smith, J. Webster, R. Lee, C. J. B. Williams, Neil Arnott, Henry Clutterbuck, and James Clark. The three last-mentioned gentlemen, *true to their principles* (to their honor be it spoken), refused the fellowship when offered to them. All the rest took it; and, we believe, with one exception (Dr. Hall), have not opened their mouths since to cry Medical Reform. Godfrey's cordial never quieted a crying baby with more certainty, nor chloroform subdued a restless spirit more effectually, than the fellowship-sop did these *quondam* reformers. The petitioners complained "That bye-laws had been framed which are directly opposed to, and in violation of, the letter and meaning of the Charter, which spoke of the College as a Faculty or Commonalty. That the founders all studied at, and obtained degrees at, Foreign Universities: and that no distinction is mentioned as regards the university where a physician may have obtained his degree. That the fellows have usurped all corporate power. That the term licentiate (by implication) is a degradation; and that *all* are entitled to the fellowship. That the licentiates are not even admitted to the Library or Museum of the College. That the College demand, and take a large sum of money, for the privilege of practising as physicians within a circuit of seven miles of London; and that they do not, and *cannot, protect them in this privilege.* That Dissenters are excluded from the fellowship; and that these invidious bye-laws have produced continued litigation, and created a jealousy between the fellows and licentiates, discreditable to the members of a liberal profession."

We now bring the history of the College of Physicians to a climax, by quoting some of the Parliamentary evidence in 1847; evidence by which our aristocratic legislators are to be guided in the construction of the forthcoming Medical Bill. We dare not trust ourselves to comment on this report; but we direct the reader's attention to those parts of it that we have placed in italics. The examination referred to the Medical Registration Bill then before the House of Commons, introduced by Mr. Wakley and Mr. Warburton. But *all* the evidence should be seen.

Dr. Paris, President of the College of Physicians. Question 55. Have any complaints come within your knowledge, or have they been preferred to you, or are you cognizant of any complaint, of any abuse of power or authority, as exercised by the college?—No.—56. No complaints have been addressed to the college of abuse of their power and authority?—*No; I am not aware of any.*—57. Are you aware, whether to Parliament, or to other constituted authorities, any representations have been made of the abuse of your power?—I believe there have; in the various attempts made to obtain reform, I have no doubt that statements against our college have found their way into various petitions.—33. When you say that the knowledge of languages is tested, is it in more than one dead language that the parties are examined?—Latin and *Greek.*—269. You say that you think the profession ought to be registered in grades?—Yes.—38. Besides examining, have you any other power over physicians practising in London, and within a circle of seven miles?—Yes, we have a *moral* power; if any licentiates or fellows conduct themselves in a way which *we consider unprofessional we summon, censure, and fine them;* and we consider that that is quite sufficient. We do not want any further power as to punishment.—231. Have you any fellows of the college who practise mesmerism at this time?—I believe there are some.—232. Is it not notorious that such is the case?—Yes, it is notorious that one fellow of the college does practise mesmerism.—233. Has he received any censure from the college?—*No.*—Since he has so publicly practised mesmerism has he been permitted to deliver a public oration in the college?—He has.—235. He was selected voluntarily for the performance of that duty, was he not?—Perhaps I may be allowed to explain the circumstances under which he was appointed. *The appointment rests with the president;* and the rule is, that each fellow in succession should have it offered to him. When it came to the turn of this gentleman, finding that no public notice had been taken of this by the college, but that he was, so far as the college was concerned, *rectus in curia,* I felt it to be my duty, as president, not to pass him over, *and I therefore appointed him.*—290. But, in point of fact, the powers of the college at law are so weak and so paralyzed that they have not thought it their duty to attempt to punish parties who have entered into such compacts, although you deem those compacts in the highest degree injurious to the character of the profession?—I do not consider the law weak; the law is strong; but *we have not the means of carrying it into effect.*—291. You mean you have not money?—*We have not money.*—128. Will you be kind enough to explain on what principle you think that the distinction can be defended which is made between persons practising within seven miles of London and persons practising throughout the rest of the country; and why a different rule should be imposed upon the man who practises at Chelsea and the man who practises at Norwich?—Such is the present law.—129. But does it appear to you to be a reasonable state of the law?—Yes, I think it is; I think *that a higher order of physicians should be secured for the metropolis;* that has *always worked very well,* and it has preserved very much the *dignity of the profession.* In many parts of the country it is hardly to be expected that persons can be educated to the same extent that they are for metropolitan practice; you would not be able to secure the class of physicians for the remote provinces, suppose you equalized the character of their education; but, however, *the fact is now that the same examination takes place for extra licentiates* (as they are called) *as for licentiates.*—130. Do not you conceive that the superiority and dignity of the profession in the metropolis is sufficiently explained, and would be always secured by the circumstance that the greater prizes for eminent men must always be there; is it not rather the greatness of the prizes which talent and learning obtain in the metropolis than any rule respecting a circle of seven miles, which has caused the London circle to draw to it the most eminent medical men in the kingdom?—I think not.

203. A gentleman (Dr. Lankester) who had obtained an extra licence to practise beyond seven miles of London, having applied for a licence to give him a right to practise within seven miles of London, was examined and rejected by the censors?—Yes.—204. Was that gentleman a lecturer in one of the schools in London?—That I am not aware of.—205. Do you know whether he was examined by a lecturer in a neighbouring school in the metropolis?—Very likely; I really cannot charge my memory with the data at present.—206. Does one black ball, after the examination

has taken place, have the effect of rejecting the candidate?—No.—207. How many black balls must there be?—At the board there would be five, the president and the four censors; *and there must be a majority in order to exclude the party.*—208. How long has the question been decided by a majority?—As long as I remember; I was a censor 30 years ago, and it was decided by a majority then.—209. Do they decide openly and in writing, or do they decide by putting balls into a box?—There is a ballot, but there is no secret about the voting.—210. It is decided by ballot?—Yes; *every gentleman puts in a ball.*—211. And in the absence of the candidate?—Yes.

308. Would you not infer from that, that the public do not want them (physicians)?—No; I speak from my own knowledge. A general practitioner this morning told me that if this Bill passed *he should withdraw his son from Oxford;* and he is a leading member of the body calling itself the National Institute of Medicine; he said that it was not his intention to bring his son forward as a physician if the Bill passed; that he considered that the *character* of the physician would be entirely lost.—309.—Did he explain how the public would sustain any loss from that circumstance?—No.—132. May I ask what the functions of the general practitioner are exactly; does he not unite the functions of physician, surgeon, and apothecary?—*He practises in medical cases, and, to a certain degree, in surgical cases.*—133. He does then, in fact, all that the physician does and all that the surgeon does, but in a way generally not quite equal to the way in which the physician or the surgeon would do it; is that your opinion?—Yes; *he treats medical and surgical cases to a certain extent.*

159. Not being prepared to admit, having, on the contrary, every reason to deny, that the Royal College of Physicians has abused its powers, you contend that those powers ought not to be abridged?—*Certainly.*

Dr. G. Burrows said the charter bound the College of Physicians to exercise great *moral* control over its members—that the neighbouring practitioners might *club* together to ruin a man (385, 387)—he *thought* the licentiates had made complaints (761)—that a general practitioner does not perform the duties of a physician (779)—he has not such *complicated cases* to deal with (823)—he is expected to practise his profession, the *physician* to teach (816)—so strict a knowledge of pathology *not necessary* to the general practitioner (822)—the majority of those who enter the profession enter the *lower grade;* they are generally persons of *humble means;* and they *just* get as *much* medical knowledge as will enable them to fill certain public situations, such as surgeons under the poor law, or *assistant surgeons* in the navy, or they commence practice in a *small way* (442)—that the distinction between medicine and surgery is as clear *as between night and day* (952). *Dr. F. Hawkins:* The charter requires that the *elects* should be examined, but they are not (996)—age is taken as the test of superior wisdom (997). *Dr. H. Holland:* The College of Physicians could not exist with a "One Faculty" (1510)—the relation between the higher ranks of the profession, and the higher class of society most important (1527)—insanity exceedingly prevalent amongst the higher classes, and hence the importance of an academical education to a physician (1530).

College of Surgeons.

The Company of Barbers, or Barber Surgeons, was incorporated by Henry IV. In the third year of Henry VIII. it was enacted that no person should practise as a surgeon, within seven miles of London, unless approved of by the Bishop of London and the Dean of St. Paul's, who were assisted by four expert persons of the faculty; thus doing away with the exclusive practice of the barber-surgeons. In the 32nd of Henry VIII. the two companies were united by Act of

Parliament, under the title of the Mystery and *Commonalty* of the Barbers and Surgeons of London. A charter granted by James I. assumed to give the surgeons of the company an exclusive right of practising within three miles of London, and the charter of Charles I. extended this right to seven miles; but the effect of these charters was nullified by the right which the bishop and dean, with their co-examiners, possessed of examining all practisers of surgery in London. In the 18th of George II. the surgeons were constituted a separate company, and the power of the bishop and dean was repealed. In 1796, in consequence of the death of the master of the corporation, and the illness of another of the governors, a legal court could not be formed, and the corporation became dissolved. In the following year a bill was smuggled into Parliament and passed, giving this defunct corporation increased powers, with a monopoly of lecturing on surgery, &c. It had been twice read in the Lords, when the members discovered the iniquitous tendency of the measure, and by strenuous and combined efforts defeated it. Lord Thurlow called it "a miserable and wretched performance, in which the arrogance of the provisions maintained an equal contest with their absurdity." The corporate officials, however, had, *as at present*, more weight with the ministers and the king than the members; and George III., on the petition of the twenty-one old corporators, constituted them a "Court of Assistants," with power to elect their successors under the title of the Royal College of Surgeons in London. Matters proceeded as quietly as might be expected in these good old days of aristocratic rule, popular ignorance, and submission; but the acts of tyranny and oppression were too flagrant and frequent to allow even the obedient and peaceable members of the college to submit to them. They paid their money (£21.), were dubbed surgeons, and then their interest in the institution ceased. If they entered the college they were compelled to sneak in at the back door. The library and museum were closed to them; and the completion of the catalogues was neglected. The men who governed them were self-elected councillors and examiners, and had the means (as at present) of putting money into their pockets by compelling the students to pay for certificates at certain hospitals where they attended, and for lectures which they delivered; whilst they rejected certificates of attendance at the continental schools of greater value than their own, and refused to recognise the lectures of men who were infinitely their superiors in scientific and practical knowledge (Brooks, Bennett, King, Dermott, and Kiernan). The examinations, too, were disgraced by petty squabbles among the examiners, who had their crotchets and "examination dodges," which were better suited for a cock-pit than for a hall of science. Some who belonged to their own clique were let off with the searching question, "Pray, sir, with what instrument would you bleed?" But *medicine*, *midwifery*, and *pharmacy*? "Oh, no, they never mention them!" and there are *now* 1,600 members of this college practising medicine who have undergone no examination in this science, although nineteen-twentieths of their practice is medical.

Complaints, as at the College of Physicians, were constantly made by the members. Dr. Mason Good, in 1798, wrote two severe pamphlets against the college, condemning its exclusive laws, and

ridiculing the pure system of surgery. The Lancet, established in 1823, used its powerful pen with good effect; and in February, 1826, a large meeting of the members of the college (including Messrs. Wakley, Wardrop, Key, Lloyd, Kingdon, Welbank, Macilwain, and Tyrrell, who spoke on the occasion), took place at the Freemasons' Tavern, at which Mr. William Lawrence (a late president of the college) presided;—he had not then tasted the sweets of office. Mr. Lawrence denounced the infamous bye-laws, and the general acts of the college, in no measured terms; and no political harangue ever delivered by a member of our profession contained so much bitter sarcasm, such an exposure of corruption and corporate abuse, as the one in question.

In addition to the extracts we have already given (vol. I., p. 81,) we quote two or three of the more temperate remarks, which will apply equally to the *present state* of the college, and to the profession.

"The term 'Commonalty' must, of course, denote the *general* body of members."

"While the science has been extended, and its literature enriched abroad by the Mascagnis, the Caldanis and the Scarpas, by the Soemmerrings, Walthers, Prochaskas, Reils, Tiedemanns, and Meckels, by the Bichats, Béclards, and Cloquets, we can hardly mention a single Englishman whose name is known as an anatomist beyond the shores of the island."

"Have you ever heard, gentlemen, of physiology? It is not mentioned in the college list of studies; an omission the more remarkable, as having been made in the very precincts of the magnificent temple, consecrated by the genius of Hunter to physiological science. Have you ever heard of pathology? of the changes produced by disease in the various structures and organs of our bodies, of the alterations in the living actions, of the causes that produce such changes, of the agents and circumstances capable of arresting them, and of restoring or preserving health; that is, of morbid anatomy, of *theoretical and practical medicine*, of therapeutics, of *materia medica* and *pharmacy*? These are altogether omitted. Two other serious omissions may be noticed. It is sufficient simply to mention *midwifery* and the connected subject diseases of women and children. No branch of medical science is more important."

I think that *all the honours and rewards*, which the profession can confer, should be open to *all* the members alike, without respect of *persons* or *classes*, and that the only distinctions which ought to be recognized are those which *talent and industry may be capable of achieving for themselves.*"

The history of this college would be incomplete if we omitted to mention a circumstance that occurred in 1831. In the month of January, of this year, an admiralty order appeared, forbidding the attendance of naval surgeons and assistant-surgeons at the king's levees. The lords of the admiralty could not allow physic to "come between the wind and their nobility!" The profession was naturally indignant at this additional insult to the surgeons of the navy. Mr. Wakley, the editor of the Lancet, very properly suggested that the members should discuss the matter in their own college, before the delivery of the Hunterian oration, on the 14th of February. The grievance was discussed, and resolutions passed; but the council, not taking the interest in the subject that its importance demanded, it was recommended that the matter should be again brought forward before the delivery of the lecture on the 8th of March. The council forbade the discussion, and had a posse of police officers ready to take those into custody who disobeyed their orders. Mr. Wakley and others, in spite of the threat, moved resolutions. Mr. Wakley was dragged by three police officers out of the theatre, amidst the most indescribable confusion. He gave Ledbitter, the officer, in charge; preferred his complaint against him at Bow Street, but the case was dismissed. The council blustered—gave notice of action—but thought better of it. The objectionable order respecting the naval surgeons was quickly rescinded. We believe it never had the sanction of a *sailor* king.

In 1834 through the exertions of Mr. Warburton and others, a Parliamentary enquiry into the state of the medical profession took place, and we must refer the reader to the first volume of the "Examiner," (page 80) for a condensation of some of the evidence. A vast amount of abuse of power, and corporate selfishness was exposed before this committee, and some strange and startling evidence was given (2518).

"Sir E. Home inserted Hunter's manuscripts as his own, in the Philosophical Transactions, then burnt them; but was not censured by the college, and remained a trustee of the museum up to the time of his death, (5650). Sir B. Brodie would have the council elected by the upper grade only, and he considered surgery the most useful and scientific branch of the medical profession, (5677). Mr. Guthrie thought practitioners in midwifery should be excluded from the council (4770). Mr. W. Lawrence advocated an upper grade, the members of which should *elect the council* and they *only, should be eligible for hospital appointments*, the *general body* to have no *voice in the election* of the council (6085, 6089). These gentlemen would not attempt to suppress illegal practice. Sir C. Bell would intrust the selection of councillors to the *whole body* of the members and would not exclude *any class* from the council. The lower grade would beat the higher; early exertion and the absence of fortune gave vigour to intellect: he objected to grades, (5852,5864)."

In May, 1837, Mr. Warburton stated in the House of Commons that he intended to introduce a bill, founded upon the Parliamentary evidence, for effecting important changes in the medical law, but Mr. Warburton after collecting his forces for the engagement, and contemplating the strength of the enemy, their ancient armour, burnished with modern brass, sheathed his sword and turned tail.

In December, 1836, the British Medical Association was formed, and one of its chief objects was the establishment of "One Faculty of Medicine," in each of the three kingdoms and the representative system of government; for these it petitioned the House of Commons. Amongst its founders were Drs. Webster, Marshall Hall, Grant, Granville, Green, Thompson, and Messrs. Liston, Grainger, Pilcher, Farr, Wakley and the Editor of this Journal ("Lancet," 1837, p. 606). In 1839 the north of England Medical Association prayed for *uniformity* of education and examination, in the three kingdoms and the *representative* system of government. The Provincial Association numbering 2,000 members soon afterwards petitioned the house for similar laws, and many other petitions of a like character from various parts of England, Ireland, and Scotland were presented, but not one by the Corporators in favour of their system; *they* worked in the dark. We mention the above circumstances to show the general feeling of the profession respecting efficient medical reform, and how little the members of the legislature concerned themselves about the matter.

In 1843 it was rumoured that new charters were to be given to the Colleges of Physicians and Surgeons, and the British Medical Association petitioned the Queen and Parliament that no charter should be granted until the whole matter of medical reform had been fully discussed before Parliament. But dark and secret influence was too powerful, the voices of a few of the corporators were heard; the ministers were deaf to the thousands who had petitioned for *efficient* medical reform. This charter empowered the self-elected councillors of the College of Surgeons to select three hundred persons to be called fellows, and before twelve months to appoint "*any other member or members to be made fellows.*" Begging letters to the men who had the title to give away, poured in in abundance; some had cut for the stone, others for fistula, but *all* the applicants had supported the *dignity* of the college. Two hundred and forty-two fellows were added to the three hundred already made, but it will be observed that the *charter* did not limit the number,—the *council* did this!

The members chosen were generally those connected with hospitals and dispensaries; men who had been apprenticed to the pures, and had obtained their appointments through *private* interest and *money*, and the *generality of whom had undergone no examination in medicine, pharmacy, or midwifery*. The sequel of this obnoxious charter is too well known to the profession to need farther comment. It shows that a *few* of the medical attendants of the men in power have more influence than the *multitude*. It has led many in our profession to think that there must be something *radically* wrong in the constitution of our Parliament.

In August, 1844, Sir James Graham introduced his bill for the better regulation of Medical Practice. The chief features in this bill were the repeal of all charters; a Council of Health and Education, composed of physicians, surgeons, and of six other persons appointed by the crown; the registration in grades to be enforced; all the diploma shops to enjoy the same privileges. The apothecaries to be thrown overboard; no restriction to be put on illegal practice and quackery, but the Morrisons, Solomons, and Edys to have full swing, and be allowed to add to the revenue. The cloven foot of monopoly is apparent in almost every clause of the bill. In May, 1845, the bill was introduced in an amended form. A College of General Practitioners was to be formed, and a candidate before examination to practise as a general practitioner was to have a *liceat* from a board composed of six surgeons and six physicians. The bill was again amended, and after being botched, patched, and tinkered in various ways, was quietly disposed of.

In 1844 a National Association of General Practitioners was established, and nearly four thousand gentlemen enrolled themselves for the purpose of forming a National Institute of Medicine and Surgery, upon the representative principle; various communications were held with the corporate bodies, and a draft of a charter was proposed. Too many of the council, however, were mushroom reformers, who had not been chosen fellows of the College of Surgeons, and were reformers from *spite*, not from *principle*.

In August, 1846, Mr. Wakley introduced his Medical Registration Bill which enforced a general registration of medical practitioners and uniformity of education, qualification, and fees (diploma) throughout the kingdom. The *appointment of the Court of Examiners by the Colleges of Physicians and Surgeons.* The bill was withdrawn in June, 1847.

In June, 1847, another committee formed to enquire into the laws of the medical profession commenced its labors, and Messrs. *Brodie*, *Guthrie*, and *Lawrence* were again examined, and told nearly the same tale.

"*Mr. Lawrence* did not know that the College of Surgeons had any privilege in the nature of a *monopoly* (1676). Medical practitioners are *properly registered* at the present time, (1703)—he did not think that the profession wanted *remodelling* (1748). Did not know of any hospital appointment being obtained by *improper means* (1857). That a council of health is *unnecessary*, and the system of the college answers *very well* indeed (1889, 1892). The Taunton pastrycook who passed the college examination (1846) was forty years of age, and came up with evidence of fifteen months' study (1900). The members of the college *too numerous* a body for election (1957). *Sir B. Brodie*, the examination as good as examinations *can be* (1997). The great mischief at present is the *cramming* for the *Apothecaries Hall* (2142). That the new charter has worked *well* (2157). The meetings of the council should not be *open* to the members (2687). What he called the *profession*, were men of *good sense* and *experience* (2688). *Mr. G. J. Guthrie* believes self-election is by far the *best way* of electing the council (5). Saw Lord Normanby and Mr. Fox Maule on the subject of the charter (6). *Army* and *navy* surgeons should be elected to the council (18). The number of fellows was limited to 542, because the *private* advisers of Sir James Graham thought it desirable (44). The public should employ *anybody they please*, qualified or *unqualified* (86). *Public* examinations not desirable. I am said to be the severest examiner and the most lenient judge (174). If my fellow examiner made one gentleman say so-and-so which *I did not like*, I made the *next man* say so-and-so, in the way *I did like* (80). Would have no examining bodies unconnected with *schools* (146). *Mr. J. H. Green*, the distinction of fellows and members not *invidious*, the only mistake was in the nomination of *too large* a number of the latter (2297, 2328). The establishment of a higher grade is an unmitigated good (2277). I should hardly say that there is a feeling among the *profession* (respecting popular election); there is among the *general practitioners* (2346). We should as little think of examining upon *medicine* as upon *theology* (2482). A single faculty would reduce the system of education to the *lowest* (2382). In many instances I have found young men incapable of *spelling*, and incapable of *comprehending* a considerable part of the lectures which were delivered to them, (2527). The College of Physicians *should examine* the *general practitioners* in medicine (2338).

We may conclude the history of this college in a few words. Since this evidence was given the council have been compelled from *poverty*, and the pressure from without, to make several concessions, but *all* in a higgling, miserly spirit. They cried right lustily at the onset of the fight, "No surrender, and grades for ever," but they soon hoisted the white flag—

> "Great actions are not always true sons
> Of great and mighty resolutions."

By their last concession they very graciously admit all to the fellowship, who have been deprived of corporate rights for 20 years, who will put 10 guineas into their empty chest; and who, *previous to the ballot*, can get their morality tested by three fellows, who have paid nothing for their freedom, and have given no proof of the *purity* of their own conduct.

We wrote to the council of this college, January 16, 1850 (as a member), to ask permission to inspect the accounts, and ascertain how the £234,322. 19s. had been spent, during the previous sixteen years? Our letter was noticed after four months, and the application refused. Although this *enormous* sum has been expended in this short period, the College has recently applied to the government (through Sir H. Inglis and the Bishop of London) for increased funds for the support of the Hunterian Museum, and as the general practitioner pays no income tax, and has plenty of superfluous cash, he will, we suppose submit to the grant without murmur or reproach?

THE SOCIETY OF APOTHECARIES.

The Apothecaries, or Poticaries as they were called, were formerly united with the grocers. In the reign of James the First they were separated from the grocers, and gradually acquired more importance; but they were, to a great extent, subordinate and subservient to the physicians, who had the power of increasing the amount of their profits by sending them their bills or prescriptions. So greatly had the practice of the apothecaries encroached upon that of the physicians, that it was customary, in the reign of Charles II., for some of the latter to supply their own medicines, without charge; or they ordered articles that could only be obtained of their own agents, so that the apothecaries might not copy their prescriptions. The physicians did not ask themselves whether 700,000 people required more than 100 medical attendants? but their *morality* consisted in endeavouring to keep all the profitable practice to themselves. The following extract from the college annals, dated March 1st., 1694, is very explanatory.

"Dr. Torless reports that on hearing the city of London petition against the Apothecaries' Bill, the Apothecaries' counsel (by instructions from them) as the college committee were informed, did without reason or occasion given by the college, use very reflecting expressions against the members of it, as negligent, careless and uncharitable, indeed, making them of little use in comparison with the Apothecaries, who by reason of their great knowledge, skill, and care, which they very much enlarged upon, were more necessary, that they were, for the Apothecaries corrected the *errors* of the Physicians' bills, *they had nineteen parts in twenty of practice of the practice of Physic in London*, and they took care of *all* the *sick poor* and servants in and about London, who must otherwise *perish without their assistance*; for the Doctors would not come to the poor *without fees*, nor to the *rich if at dinner* or *in bed*, whilst they came at all times and gave their *advice and physic to the poor for nothing*, with many other expressions of a like nature."

At the commencement of the present century the general practitioners began to feel the necessity of compelling all who practised medicine to undergo an examination. Meetings were held; and one of the most active in the movement was Dr. Mason Good, who probably owed his rejection at the College of Physicians to the liberal part he had taken in medical politics. The first meeting of the Associated Apothecaries and Surgeon Apothecaries took place July, 1812, Dr. G. Mann Burrows in the chair. A petition to Parliament was prepared, asking that all apothecaries should be examined, &c. The Colleges of Physicians and Surgeons were applied to, but they both refused to have any thing to do with the examination of the general practitioners; and they threw every obstacle they could in the way of the Apothecaries' Act, and were the means of rendering its provisions less useful and extensive than its originators intended. The Apothecaries' Society stated that they would act only *under the directions* of the College of Physicians. The bill of 1812 was withdrawn; another, in 1814, after being mutilated in the House of Lords was also abandoned; and the present Act was only carried by a single vote on the third reading. At first the examination required was not of a very stringent character; but it is worthy of notice that this society, in 1815, required the student to attend *two* courses of anatomy, whilst the council of the College of Surgeons were satisfied with *one*. This company has gradually extended their curriculum; and their present political counter-move is for mathematics and Greek! But let the examination be equal to that of the Faculty of Medicine of Paris, the *name* spoils it, it acts like an emetic; and, as we have shown in our last number, some of the examiners even are ashamed of it.

This company possesses all the bad corporate monopolies of its elder brethren. It has, moreover, the additional stigma of a trading fraternity; the *members* deriving a profit from the sale of drugs; and no one who has not had this privilege for ten years can be an examiner. The company consists of a master, wardens, and assistants. The examiners are elected by the assistants, ~~and~~ when chosen are generally 60 or 65 years of age. The licentiates are either privileged to practise in London or within seven miles, or in the country. The former pay ten guineas, the latter six. This the effect of the bad example set by the College of Physicians. To show the monstrous and absurd state of our medical laws, a member of this society may practise as a physician, but a physician cannot dispense his own medicine without being liable to a penalty.

This company exercises a despotic power, more worthy of the days of the Tudors. The recent refusal to recognize the lectures of Dr. Muspratt, of Liverpool, until shamed into the concession by the public press, is a good example of corporate abuse of power. But we terminate this history with a correspondence we have had with the worshipful Society, which speaks volumes:—

November 6th, 1850.

Sir,—As a *licentiate* of the Apothecaries' Company I beg to make the following enquiry. I find that since 1841, about £22,068 have been received by the Court of Examiners of the Apothecaries' Company, I am desirous (as a licentiate) to ascertain how this money has been expended, and how much the examiners have received for their duties, &c.

Oblige me by placing this letter before the proper authorities, and by informing me whether my request will be granted?

As the question is one that must interest every member of the Company, as well as the profession generally I shall make my answer public. If I do not hear from you before the 1st of December I shall conclude that my request is denied.

I am, Sir,

Henry Blatch, Esq., *Secretary.* Your obedient Servant.

Apothecaries' Hall, 8th November, 1850.

Sir,—I am directed by the Master and Wardens to acknowledge the receipt of your letter of the 6th instant, stating your desire to ascertain how the money which has been received by the Society for certificates since the year 1841 has been expended, and how much the examiners have received for their duties, &c.

The Society are always ready to afford full information in reference to their expenditure of the funds which come to their hands in their administration of the Apothecaries' Act, when called upon to do so by competent authority, but they can hardly hold themselves bound to furnish such information at the instance of an individual licentiate of the Society.

For information generally on the subject of the receipts and expenditure of the Society, I beg to refer you to the returns which have been made from time to time by the Society to Parliament, and to the reports of the evidence given by members of the Society before successive Committees of the House of Commons on the subject of Medical Education. I am, Sir, your most obedient Servant,

ROBERT B. UPTON,

Clerk to the Society.

November 10th, 1851.

Sir,—The answer I have received from the Master and Wardens of the Worshipful Company of Apothecaries is just the one I anticipated; it amounts to this—that the Licentiates have as much control over the affairs of the Company, as the inhabitants of Kamtschatka. The reports you refer to, do not afford the required information. I am desirous of knowing, how much of the sum mentioned has been received by the examiners?—How much has been spent in dinners?—How much in prosecuting quacks and unqualified practitioners?—How much in prosecuting Edinburgh graduates? and the amount expended in *scientific* purposes?

R. B. Upton, Esq., I am, Sir, your obedient Servant.
Clerk to the Society of Apothecaries.

In our next we will give, in a short space, some practical deductions from the above evidence, and take the liberty, at the same time, of asking the general practitioners of England a few plain questions, which they can answer as they please.

Some plain Questions to the General Practitioners of England, and the Editor's Plan of Medical Reform.

Before we put the questions we alluded to in our last number, we must place once more before the reader the *outlines* of the plan of medical reform we have advocated in the first volume of our journal (p. 30). That a Faculty of Medicine, composed of all the practitioners who have obtained diplomas in the United Kingdom, shall be formed in England, Ireland, and Scotland; and that the senate,* council, or governing board of the said faculty, shall be elected by the members of the various universities, colleges, and halls of the three kingdoms; the graduates of Universities, and the members of the Colleges of Physicians, electing the examiners in medicine and pathology; the members of the Colleges of Surgeons, the examiners in anatomy, physiology, and surgery, and the members of the Apothecaries' Company (from their own body); the examiners in chemistry, materia medica, botany, and midwifery. That the members of the senate, or examining board, shall receive a fixed salary, and shall not be teachers, nor derive any profit from the sale of hospital tickets or lectures. That a preliminary examination in mathematics and classics shall be instituted; and the examiners shall not be members of the medical profession. That the four subsequent examinations—1. In anatomy and physiology; 2. Chemistry, materia medica, botany, and midwifery; 3. Surgery; 4. Practice of medicine, pathology, and medical jurisprudence—shall be conducted in public; and shall be open to all legally-qualified practitioners. That the same curricula, and the same price for the diploma, shall be required in the three kingdoms; and that *all* who practise medicine and surgery after ——— shall obtain the degree of doctor of medicine and surgery from the faculty before they are entitled to registration. That the examinations for a few years shall be suited to the acquirements of the students; and that the expense of attendance on lectures and hospitals shall be so regulated by government as not to exclude the student of humble means, who is more likely, if a *fair* field is open to him, to advance medical science.

The reader will naturally ask what will become of the existing corporations? We answer, does their past history demand for them a moment's consideration? But to whom does the right belong—to the *thousands*, or to the *units*, who have usurped a power for their own aggrandisement, and not for the good of science? It will be observed that the establishment of a Faculty of Medicine, according to our plan, does not interfere directly with the vested rights of one of these corporations; but it gives to every member of university, college, or hall, the privilege of voting for the senate of the faculty in the country

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* The examiners would form the senate, and would be composed of 20 in each country, including the non-medical examiners. They should receive £500. per annum; and the surplus from diplomas would be amply sufficient for the support of the faculty, including the library and museum.

where he obtained his degree. Thus a man who procured his diploma in Scotland, would only vote in that country; and those with English or Irish diplomas would enjoy the franchise in their respective colleges or universities.

In England the College of Surgeons might be converted into a Faculty of Medicine and Surgery. The Dublin College of Surgeons might be the seat of the Faculty in Ireland; and in Scotland the University of Edinburgh, or the College of Surgeons, might be the residence of the Faculty.

The Apothecaries' Companies of London and Dublin would still exist as trading corporations; and their present members would take their proper share in the formation of the senate or examining boards of the faculty. The universities would continue as schools of general education and medical instruction. The Colleges of Physicians, now poor and powerless, could not be in a worse condition; and those of London and Dublin might dispense with the examination farce, and like the Edinburgh College of Physicians, admit men by *one* ballot, without examination.

We scarcely need point out the advantages that a Faculty of Medicine would confer upon the medical student. Instead of being crammed as at present, for one examination, with "grinder's knowledge," he would have time to prepare for the various subjects, and obtain information that would not vanish as soon as acquired, but would serve him in time of need. The publicity of the examination would also ensure him fair-play; and would not allow the vagaries and crotchets of the examiners to operate to his prejudice. The faculty, would, moreover, give him a title and a position of which he need not be ashamed. But the great and lasting good of a Faculty of Medicine to the future generation would be the institution of the concours;—the destruction of the present system of nepotism and corruption in hospital appointments, so that the patrons of the Lord Noodles and of the Aldermen Stenches would not encumber the Temple of Science, and close the gates to her true worshippers. The poor and industrious student might then, like the great men we have pointed to in France, achieve a position and a title more worthy of respect and honour than the *hereditary* bauble of duke or marquis.

Those who are anxious to keep up the present distinctions and grades will find a thousand objections to the above proposal.* Dr. Holland said, in his Parliamentary evidence, that the College of Physicians could not exist with a "One Faculty" (1510). Mr. Joseph Henry Green said that a single faculty would reduce the system of education to the *lowest*; but, nearly in the same breath, he so stultified his evidence as to assert that young men were incapable of *spelling*, and of *comprehending*, a considerable part of the lectures delivered to them (2527)!!

We now ask the general practitioners of England (and in addressing

* We do not for a moment insinuate that these gentlemen did not give their evidence conscientiously, and to the best of their abilities; but we believe that they all have a corporate bias, and a hankering after grades and clubs. As we have observed before, when a parson looked through a microscope he saw a church, a lady saw two lovers, and a city alderman beheld Smithfield market, but smelt nothing.

ourselves to this class we speak to the great bulk of the medical profession in the three kingdoms who practise medicine, surgery, and midwifery), the questions we have before spoken of:—

1. Is there one amongst you who can suppose, like Mr. J. H. Green, that a Faculty of Medicine would reduce the system of education to the *lowest?* Would it not, on the other hand, elevate the character of our profession, and produce such a bond of unity and brotherhood as would obtain for us, as a body, that public respect which from our internal dissensions, clubs, sections, and grades, is now withheld from us?

2. Can the general practitioner suppose that the plan of reform contemplated by the Colleges of Surgeons and Physicians, to fill their empty coffers, will improve his name and position? If he has read the Annals of the London College of Physicians, and our history of this corporation, can he find one redeeming feature—one bright spot in the dark and gloomy retrospect? Is there the slightest exaggeration in the petition presented by Mr. Hume to the House of Commons, in 1832, by the British physicians, "as to the probable amount of lives prematurely destroyed in 300 years by the culpable inactivity of this college?" Can the general practitioner read the annals we have placed before him, and the more recent acts of this body, and desire to submit to its yoke? Is not the late warning of Professor Syme, of Edinburgh, who may be considered an impartial witness, worthy of attention? These are his words, in his letter to the Lord Advocate of Scotland, on Medical Reform, 1850, "It is hardly necessary to remark that a college which supported their president in, and identified themselves with, the perpetration of such an outrage on decency and propriety (the Swiney Cup adjudication, by three office-bearers of the college), could be safely trusted with any power of controlling the members of a liberal profession?"

3. Should not the past and present history of the College of Surgeons teach the general practitioner a useful lesson? If the council, in their memorial to Sir G. Grey, July 22, 1850, said "that those who practise pharmacy (and this applies to nineteen-twentieths of the profession) have been *immemorially designated as apothecaries*," is it to be wondered at that the *Times*, the leading journal of the day, should designate the general practitioner Mr. Camomile, call his residence Rhubarb Hall, and insult his page, with "bright buttons," by insinuating that the quantity of medicine he delivers is in proportion to the swallow of the patient, and the capacity of his stomach? Is it surprising, moreover, that a late writer in Blackwood (June) should apply to the general practitioner the dignified epithet of Dr. Dosewell?

4. If Sir B. Brodie (Parliamentary evidence, 1847, (2688) said, "what he called the *profession* were men of good sense and experience;" and Mr. J. H. Green, another president of this college, excludes the general practitioner (who has passed the same examination as himself, and in addition has mostly a medical diploma) from the rank of a professional man (2346), what will be his *position* and *name* when he of the *lower* grade, as he is now called, is examined solely by the *higher?*

5. If ten years ago the *members* of the College of Surgeons were required to be *six* years engaged in the acquirement of surgical

knowledge, why has the term now been reduced to *five* years? and how did the Taunton pastrycook, and other members, obtain their *surgical* knowledge?

6. Is there any reason why a man, who is unable to read and write, may not now become a member of this college? A celebrated London grinder, an M.D. of the University of London, and a Fellow of the College of Surgeons, is in the habit of telling his pupils "that he would prepare a matchmaker for the college examination in three months!"

7. What part have these colleges taken against quackery and illegal practice?—the oppressions under the Poor Law?—the insults to naval surgeons?—the insurance offices?—the sale of poisons, and other sanitary improvements?

8. How many mesmerists, hydropathists, homœopathists, and quacks, are there connected with both colleges?

9. Is it not notorious that a fellow or licentiate of the College of Physicians may meet any of the above without infringing the bye-law, provided they are members of the college, or in general practice; and is it not, also, notorious, that this fellow or licentiate would be liable to a penalty of £5. for meeting a London physician who is not a member of their college, although his experience and practical knowledge might be greatly superior to their own?

10. What good reason can be assigned why *every* member of a university, college, or hall, as recommended by the late Sir Charles Bell and Mr. Key, should not enjoy the right of voting for the council or senate?

11. Is it not monstrous that if the charters of the Veterinary College and the Pharmaceutical Society give their members this right, that it should be denied to the more intelligent members of the medical profession?

12. If Mr. Bell's Pharmaceutical Bill should become law, and chemists and druggists are to be called pharmaceutists or chemists, will they not possess a more scientific name than that of "apothecary," with which the Colleges of Surgeons and Physicians have branded the general practitioner?

13. If the general practitioner should fall into this college net, the strings of which are pulled by various provincial and metropolitan touters of the upper-grade, and by editors of the same *species*, what *genus* is he to belong to? How will he be classified in foreign catalogues? Where will be his habitat? Will he be satisfied to serve two masters, and to pay for his situation, as a college flunkey? or will he not rather become a member of one brotherhood or faculty, where he will take his proper position, and be properly represented?

14. Can the general practitioners expect *efficient* reform from the present government? and will it not be desirable for him, at the next general election, which is near at hand, to combine with his brethren—to form committees in every district of England—to sacrifice political feeling for the good of his profession, and for the advancement of science—and to vote and give his interest only to those candidates who will support a liberal measure of medical reform?

The 20,000 practitioners of England can effect this if they will—the game is in their own hands. Let them begin to think and act for themselves, and be no longer bamboozled and humbugged by upper-grade

touters, whose sole object is, and ever has been, the degradation of the general practitioner—the perpetuation of the race of "*respectable apothecaries!*"

A fact worthy of consideration at the present crisis.

In our sketches of the London Hospitals (vol. I., p. 205), we stated that we were not acquainted with a single hospital physician or surgeon who had left money to these institutions, although their fortunes have generally been made by means of these establishments. It is true that many of them paid handsomely for their whistle in the first instance; and others, by jackall subserviency and intrigue, had to work hard to attain the summit of their ambition. The surgeon who paid £1,000. for his hospital apprenticeship got good interest for his money; for at some of the larger hospitals his receipts for lectures and hospital entries amounted to £600. or £700 per annum, besides the increase of practice from the patients sent to him by his pupils, and the oft-quoted allusion to "the cases in our hospital."

It is natural to suppose that the high morality of one or two out of the multitude of the pures who have so long had the hospital field to themselves, and who in their blind self-sufficiency boast of its fruits, would have induced them to have added a codicil to their wills for the benefit of the sick and maimed, or a few hundreds might have been left for the establishment of prizes, or for other scientific purposes; but no such beneficence, gentle reader, from this quarter. Poor Dr. Swiney, an unknown Scotch physician, although evidently of weak intellect, had reason enough left to *desire* to benefit medical science, and some of those connected with his Alma Mater; but, alas, for college justice and impartiality.

Jackson, the founder of the Jacksonian Prize which bears his name, and Drs. Fothergill and Lettsom, the donors of the Fothergillian Medal, were none of them attached to an hospital. Fothergill, who was a Quaker, and a most charitable and excellent man, would have been excluded on account of his religious tenets, as was Dr. Hodgkin recently from Guy's Hospital.

Sir A. Cooper left a triennial prize of £300.; but as if conscience-smitten at the nepotism which had prevailed at the borough hospitals, he added the proviso, "that no person connected with these hospitals, nor any person related by blood or affinity to any such physician or surgeon, or other officer for the time being, shall at any time be entitled to claim the prize."

We have been led to the above reflections in consequence of two magnificent bequests that have recently been made in France by Drs. Jecker and Merat to the Academy of Sciences, the Institute, and to the Parisian Hospitals. The bequest of the former gentleman amounts to £28,000. Some may attribute these donations to the influence of the Catholic religion; but Guy, and a hundred other Englishmen we could name, were not Catholics. If we had a Faculty of Medicine, and if places and honors were open to all, we believe that many donations from the members of our profession, similar to those in France, would be recorded. A man now would not be simpleton enough to leave his money for the benefit of a club, or for the institution of a prize that might be given to the undeserving; but why some of our London hospital physicians and surgeons have not supported with their money the cradles that rocked them into place and fortune, is a question that we leave for the reader's cogitation?

The Harveian Oration.

We notice this oration (which was delivered on the 5th inst.) at an earlier period than usual, for the purpose of making known to our readers a discovery of the orators which may have an important bearing on medical practice. Dr. Spurgin's researches have led him to the conclusion, "that as history furnishes an instance of the total obliteration of the coronary arteries of the heart, the blood flows through the foramina in the parietes, and that the other vessels stand in relation to the veins." We extract this from the *Morning Post*, and our excuse for making the disclosure is, that as far as we know, "*It is the only instance in the history of Harveian Orations where the orator has been able to announce a discovery, or a supposed discovery, of his own.*

We shall review the oration hereafter, when it is placed before us in a proper shape; suffice it to say, for the present, that according to the *Post*, it was more "scholarly in diction than its predecessors, and that it concluded amidst the plaudits of an erudite audience." The *Chronicle* speaks of a portion of the oration on truth, which bears a great resemblance to a certain passage of Lord Bacon's; and other journals mention the high *moral* and *religious* feeling inculcated by the orator, who, we venture to assert, did not attempt to give the college a definition either of *truth* or *morality*—and why should he? It would puzzle the greatest philosophers and lexicographers the world ere saw. Lord Bacon defined both truth and morality; but his acts belied his words. The acumen of the learned president of the college, and of the fellows who were present, would scarcely penetrate the temporal signification of these terms. Cicero, who, like Bacon, did not quite practise what he preached, says, *Quod verum, simplex, sincerumque est, id naturæ hominis est aptissimus.* Horace found truth in wine. Some philosophers have said it must be searched for at the bottom of a well. The hydropathist would find it in a tub, or a wet sheet; the mesmerist in sympathy; the homœopathist in an atom; Messrs. Morrison and Holloway in pills innumerable, and ointments profitable; whilst the aristocratic member of our Board of Health, the Earl of Carlisle, like some fish we could name, nibbles at two baits—is caught by the decillionth part of the shadow of Hahnemann in the morning; and in the evening, despising aconite and infinitesimals, he quaffs allopathic doses of Falernian to the portly and "*corporate*" Saint Mary!

But preferring, like the orator, Dr. Spurgin, the analytical mode of investigation to the synthetical, we finish this article with a quotation concerning truth from that renowned philosopher and wag, Butler, in Hudibrastic verse, who thus speaks of public discernment:—

> "The world is nat'rally averse
> To all the *truth* it sees and hears;
> But swallows nonsense and a lie
> With greediness and gluttony."

The Meetings of the Provincial Association.

Now that some of these meetings have already occurred, and the great gathering of the members of the Association is fixed at Brighton, for the 13th of next month, a few words to the members will not, we think, be inappropriate at the present juncture. Admitting, as we have done, the benefit that this Association has conferred upon medical science, we have not been sparing in our remarks respecting the political movements of the body, or rather the small part of the body, the upper limbs, that have scarcely, without opposition, led the rest of the members by the nose. "Mr. A. will support *any* measure that his friend, Dr. B., proposes. Mr. H. will vote either way. Mr. C. wishes medical reform at the bottom of the sea, it will never put money into his pocket; and, as for his sons, why let them take care of themselves, as *he* has done, and as *his* father did before him. Mr. D. puts his name to a petition, and he supposes it's all right; but he tells his friend, the requisitionist, that he is just as likely to sign the other way. Mr. W. asks, like the donkey with the panniers, whose master told him to gallop when the French were coming, will medical reform take the load off my back? will it rob me of the income-tax? or soften the hearts of the Poor Law Commissioners? Whilst Mr. O. says the council of the Association are a set of humbugs, and he won't go near them."

As we are anxious that the members should begin to *think* for themselves, we must bring to their notice once more the political principles of this Association, which have been advocated for many years, viz.:—"Uniform and sufficient qualification in every branch of medical science; equal right for all so qualified to practise throughout her Majesty's dominions, and the adoption of the representative principle in the formation of the councils or governing bodies."

In addition to these *fundamental* principles of the Society, the district branches generally pray for one portal for all, one incorporation, one uniform standard of education, and the representative form of government. Can the reader, if these principles are fully carried out, make anything but a Faculty of Medicine of them?

In the last memorial to Sir G. Grey, signed on behalf of the Association by Sir C. Hastings and Mr. Shepherd, the council express their approbation of the conciliatory resolutions of the College of Surgeons, adopted on the 10th and 24th of March last; but, at the same time, they *faintly* remind Sir G. Grey that they have always contended for the election of the council of the College of Surgeons by *all* the members of respectability and good character. They, moreover, pray for new charters for the Colleges of Surgeons and Physicians; and then advise a joint board of Physicians and Surgeons, with the aid, if *necessary*, of competent examiners in midwifery and pharmacy, to examine all who enter the medical profession. The reader, who has not studied the movements of the political machine as we have done, will exclaim, what can be more reasonable and liberal than this proposition? Here is a Faculty of Medicine at once, on the representative system! Bah! does he know the past history of these colleges? their power with the legislators of the country? their upper-grade supporters, and their Jesuitical professions?

Will these corporations countenance *one portal* and *uniformity* of qualification and title when all their proceedings have exhibited their predilection for *grades?* Will they give the general practitioner a *name* and a *home?* Will this scheme abate the evil one jot, if the same law is not applied to Ireland and Scotland? Does the Worcester council desire that the general practitioner should enter the classic halls of the College of Physicians—talk Latin with the president—catch a glimpse of the Swiney Cup and the bust of Harvey—get a mesmeric touch of upper-degradism—and then quit this aristocratic region of clubs, ballot-boxes, and fountains, for ever? Orpheus was not worse treated! Let the *members* of the Provincial Association consider these things, and not find themselves between two stools that will put them in the dirt. Let them take care that the one portal is not a postern-gate.

The Pharmacy Bill and its Defects.

Our readers are aware that one essential part of our plan of medical reform is the *proper* education and examination of chemists and druggists (vol I., Appendix, p 31). That men who dispense potent and deadly medicines, the tenth part of a grain of which may make the difference between life and death, should know something of the properties of these medicines; and that members of the swell-mob, and others of the same fraternity, should not take the title of chemist and druggist, and supply their associates with chloroform and other deleterious substances. Entertaining these views, which must be common to all the members of the medical profession, we hailed with pleasure Mr. Bell's bill for regulating the qualifications of pharmaceutical chemists; but we have an additional motive for rejoicing at the introduction of this measure, viz., that if the druggists progress, the general practitioners cannot stand still; the body, now in a cataleptic condition, will be stimulated from its lethargy by pharmaceutical preparations—shamed into energy by scientific names.—*Pharmaceutical Chemist* versus *Apothecary!*

Although *medical* reform, like the wheel of Ixion, is constantly in motion, it makes but little progress; our corporate Gods, assisted by the Jupiters of the Senate House, and the Tritons of the provinces, are not averse to this quiet and perpetual evolution of *medical* politics. No sooner, however, does Mr. Bell, who is not fettered by *time-honoured institutions*, introduce his Pharmacy Bill into the House of Commons, than it progresses with Mercury-like speed; obtains a second reading; and the honourable member for Finsbury is so enamoured of it that he would pass it at once, "as there has been no opposition to it."

But let us now enquire whether the measure, in its *present shape*, should be allowed to pass the legislature? Although, as we have said before, highly approving of the general principles of the bill, we especially object to pharmaceutists and chemists (so-called) being allowed to sell quack medicines and other poisons for the benefit of the government, and to the detriment of the public. But our greatest objection to the bill, in its present form, is that not word is said about illegal practice. It is notorious that half the profits of many chemists and druggists arise from what is called counter-prescribing; and that they obtain the practice which should devolve upon the young medical practitioner. Men in our profession, of humble means, are often *compelled*, in self-defence, to keep open shops for the purpose of obtaining patients, which they might acquire without blue-bottles, if druggists were kept within their proper bounds. If the *pharmaciens* of France are limited to certain duties, why should not those of England be restricted? These matters must be looked to. In our next we will continue this subject, and point out some of the errors of Mr. Bell's speech (House of Commons, July 3rd), when he moved the second reading of the Pharmacy Bill.

ON

THE PATHOLOGY

OF

HOOPING-COUGH.

BY

GRAILY HEWITT, M.B. LONDIN.

LECTURER ON COMPARATIVE ANATOMY AND ZOOLOGY AT ST. MARY'S HOSPITAL MEDICAL SCHOOL;
AND SURGICAL REGISTRAR TO THE HOSPITAL.

READ BEFORE THE HARVEIAN SOCIETY OF LONDON,
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speech (House of Commons, July 3rd), when he moved the second
reading of the Pharmacy Bill.

ON THE

PATHOLOGY OF HOOPING-COUGH.

Mr. President and Gentlemen,

In the paper which I have the honour of submitting to your notice this evening, it is my intention to enter into the consideration of certain points in the Pathology of Hooping-Cough, and to bring before you the results of the observations I have recently made on the subject. The disease in question is one of every day occurrence, and the mortality arising from it very great, as will be seen by a reference to the tables of mortality of the Registrar General. It cannot, therefore, be deemed superfluous to bring such a subject under consideration, with a view of, if possible, arriving at a more complete knowledge of the *modus operandi* of the disease in producing the fatal results so frequently observed. Dr. West, in speaking of this disease, says, there is no affection concerning which we are so much in want of definite facts. To supply in some degree this hiatus, I venture to submit to you such observations as I have been able to make. It is not my intention to enter into the question of the essential nature of the disease, or to discuss the appropriateness of placing it in this or that class in medical nosology, the results of such a discussion being by no means evidently useful or practical, and having long ago received full consideration at far more competent hands. It will be my object to consider the disease as it is, and to endeavour to show what are the pathological conditions met with after death. Simple cases of hooping-cough are rarely fatal; the complications and consequences of the disease, then, can only be expected to be found after death; and it is to the study of these complications and consequences that pathological investigations must be necessarily directed.

An epidemic of hooping-cough which has lately occurred in the parish of St. Marylebone, and which has proved very fatal at the Infirmary and Workhouse of that parish, has afforded me an opportunity of collecting at these institutions the facts and observations which will now be brought before you. To Mr. Filliter and Mr. Mushet, the resident medical officers, I am indebted for the facilities they have afforded me for carrying on my inquiries.

The affections of the lungs and air-passages which supervene in the course of hooping-cough are generally the cause of death; and in studying the pathology of this affection, very considerable attention must be paid to them. The bronchitis of children offers, it would appear, certain characteristics as distinguished from the bronchitis of the adult; and it is also eminently probable that the bronchitis which accompanies hooping-cough differs again in certain points from ordinary infantile bronchitis, both in its nature, and in the secondary lesions of the lung thereby produced. It will be seen further on, that the occurrence of collapse of the lung in fatal cases of hooping-cough is very frequent. As I shall have to speak fre-

reading of the Pharmacy Bill.

quently of collapse of the lung, an inquiry into the state of our knowledge respecting this condition, and its connection with infantile bronchitis, will consequently prove of service in rendering the path more clear, and the results hereafter to be mentioned more intelligible. I will therefore say a few words on this subject before relating the observations which form the basis of this paper.

It was formerly the custom to look on all cases in which the lungs were found after death solidified, or at least apparently so, as cases of pneumonia; and the differences which presented themselves between this condition and the pneumonia of the adult were explained, by supposing that in children a peculiar form of pneumonia occurred. To this condition the name lobular pneumonia was given. In 1830, Dr. Alderson published a paper in the "Medico-Chirurgical Transactions," in which he describes, as a condition peculiar to hooping-cough, a carnefied state of the lung. This carnification he describes as differing from ordinary hepatization. The portions affected were exactly defined by interlobular septa, of a dull red colour, sinking instantly in water, undergoing no change by washing; the lung substance not enlarged as in pneumonia, but contracted, and presenting a combination of looseness and density such as is felt in the pancreas. The pleura was unaffected with inflammation. Dr. Alderson points out a very important distinction, viz., that between this carnification and ordinary hepatization; and to him is due the full credit of its recognition.

The carnification of Dr. Alderson is identical with that condition of the lungs of new-born children, which Jörg first directed attention to in the year 1832, and to which, in 1835, he gave the name of atelectasis, a condition now well known and understood. Amongst the writers on affections of the lungs in children during the next four years may be mentioned the names of Rufz, Rilliet, and Barthez, Rees and Seifert. Rufz pointed out a state of the lungs which he called carnification, and which he properly distinguished from hepatization. Seifert, in 1837, alluded to a peculiar form of pneumonia, occurring in infantile bronchitis. Rilliet and Barthez, in their essay on pneumonia, published in 1838, describe a carnification which resembled that produced by compression in cases of pleuritic effusion, but which was not attended by effusion. None of these latter writers, however, seem to have perceived the relation of this peculiar carnification to the atelectasis of Jörg, nor do they seem to have contemplated the possibility of its arising from any other cause than inflammation. In 1844, Legendre and Bailly published their valuable researches on diseases of the lungs in children. They first applied to the study of these diseases a means of investigation as simple as it was in its results important, and which has, as Dr. West truly remarks, advanced the progress of knowledge in this department of pathology more than the writings of the ten previous years put together. The portions of lung affected with the so-called lobular pneumonia were found by them to be inflatable, the effect of the inflation being to restore to the portions affected their normal appearance and qualities. For the name "lobular pneumonia" they substituted the term "*état fœtal.*" They pointed out the difference which existed between the effects of inflation on the portions which exhibited the fatal conditions, and on those affected with true pneumonia, the inflation producing no effect on the latter, while it restored the former to their normal appearance and qualities. The anatomical character of this "fœtal condition" they described as follows:—The

reading of the Pharmacy Bill.

portions of lung affected were depressed below the surface of the adjacent healthy lung, non-crepitant, firm, compact, sinking in water, section showing cellular interspaces, the colour of a red violet, sometimes darker, consistence variable, sometimes friable, the section smooth and not granular. To these characters was added the important one of the complete inflatability of the affected portions. Two varieties of this fœtal condition are described—the one simple, the other congested, the names sufficiently indicating the distinctions between them.

Since the publication of these researches, the views entertained by Legendre and Bailly have received the confirmation of most subsequent writers on the subject. Rilliet and Barthez, the authors of the well known text-book on "Diseases of Children," fully recognize the truth and importance of their observations. Bouchut denies, however, the correctness of the statement, that lung substance, in the state of hepatization, is not inflatable. Fuchs, in a work on the bronchitis of children, published in 1849, describes the same condition of the lung as that described by Legendre and Bailly, giving it the name of *apneumatosis*, in order to distinguish it from *atelectasis*, the first being an acquired, the second a congenital condition. Fuchs very distinctly connects this state of the lung with catarrhal inflammation of the bronchi.

Dr. Gairdner's valuable papers on "The Pathological State of the Lung connected with Bronchitis and Bronchial Obstruction," contained in the Edinburgh Monthly Journal for 1850—51, I must next refer to. Dr. Gairdner has fully confirmed the views of Legendre and Bailly, both as to the existence of the "fœtal condition" of the lung, called by him "pulmonary collapse," and as to its pathological signification. His observations were made chiefly on the collapse occurring in the lungs of adults. The same appearances are, according to him, presented by the lungs of adults as are met with in those of children who have succumbed to bronchitis. The ingenious explanation given by him of the way in which this air-less state of the lung is produced, I shall have occasion to refer to in the sequel.

Friedleben, who has written on the same subject, maintains that this collapse of the lung is always a congenital condition, and that it is not acquired; an opinion, however, which other authorities, and amongst them MM. Rilliet and Barthez do not subscribe to. The results obtained by a perusal of the works of these and other authors, may be embodied in the following propositions:—

I. That portions of the lungs in young children are often found in a peculiar condition, designated variously up to the present time as *disseminated lobular pneumonia, carnification, pulmonary collapse, fœtal condition, atelectasis, apneumatosis, marginal pneumonia, etc., etc.*

II. That this condition of the lung (excluding the congenital form to which it would be more proper to confine the term atelectasis), co-exists invariably with a catarrhal inflammatory state of the bronchial mucous membrane.

III. That it is a condition essentially different from that produced by pneumonia, properly so called, the characteristic anatomical distinctions of the two being easily recognized by a due attention to the peculiarities already alluded to.

My apology for troubling you with these historical data must be, that although well established they are not sufficiently known, and consequently the deductions arising therefrom are not widely and practically acted on.

The true pathological signification of the condition, collapse of the lung, is certainly not so generally understood as it should be; and yet nothing can be more easy than the ready appreciation of it when its characters are once pointed out. Lobular pneumonia is a term constantly used in speaking of the pathological states of the lungs in children. The term must be in many cases given up and abandoned, for, as MM. Legendre and Bailly have shown, true lobular pneumonia is of comparatively rare occurrence as a pathological condition in the lungs of children, whereas collapse of the lung is, on the other hand, very frequent. The lobular pneumonia of many former writers must be taken to mean pulmonary collapse. Hence it is very necessary that this fact should be widely known, and that the error of mistaking collapse of the lung for lobular pneumonia should be no longer committed.

The facts I am about to submit to you go to prove, that the catarrhal inflammation of the bronchial tubes which occurs in hooping-cough is, in fatal cases, attended almost universally with collapse of the lungs. It will then be obvious that an attempt to direct attention to the frequency and importance of this co-existence will not be misplaced, inasmuch as the fact will have considerable influence on the question of the appropriateness of the one or the other plan of treatment, in cases where such a co-existence is to be suspected.

The observations which form the basis of this communication, and the results of which will now be given, have most of them been made at the St. Marylebone Infirmary and Workhouse, where, during this last spring, hooping-cough has been the cause of a considerable mortality. Most of them have been made on fatal cases which have occurred at one or other of these Institutions; but some of the

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cases came under my notice elsewhere. The observations are nineteen in number.* The ages of the children who were the subject of them varied from four years to one month, the average being eighteen months. In all, the state of the lungs was carefully noted. The chief lesion found after death was collapse of the lung substance. The following is a statement of the degree to which this pathological condition manifested itself in the different lobes of the two lungs.

In the *right lung*, portions of the upper lobe were found collapsed in six cases, and in four more to a less degree.

The middle lobe was collapsed, wholly or in part, in sixteen cases.

The lower lobe was more or less affected with collapse in eighteen cases.

In the *left lung*, the upper lobe presented the same lesion in fifteen cases, the whole of the anterior tongue-like prolongation being in most of the cases affected.

The lower lobe was collapsed more or less in eighteen cases.

In seven of the cases, the portions collapsed were also congested—in some to a high degree.

The test of MM. Bailly and Legendre, viz., the inflatability of the portions of the lungs thus affected, was used in almost all the cases; and on that and other grounds it was determined, that the particular part of the lung in question was collapsed and not hepatized.

It will be at once perceived, that the occurrence of collapse was almost universal; all the cases, with the exception of one, in which there was extensive tuberculization of the lungs, presenting a greater or less amount of lung substance affected in this manner.

* See Table of Cases.

The collapsed portions were found to have the following general characteristics. They were abruptly separated from the adjoining healthy lobules, depressed below the general surface of the lung, less bulky than the unaffected portions. The colour varied from a reddish violet to a deep purple; the firmness was variable, in most cases, however, having a great resemblance to that of a piece of flesh, non-crepitant, sinking immediately in water, lobular cellular interspaces well marked. No air-cells visible in the surface, or on section, even with the aid of a lens. Section of collapsed portions showed a uniform smooth surface, slightly friable in some cases, and emitting on squeezing a small quantity of non-aërated puriform fluid. The lung substance did not break down under pressure, as is seen in hepatization. When a blow-pipe was introduced into the bronchus leading to the affected portions, and inflation performed, the aspect of the collapsed portions underwent a striking change. They immediately assumed the appearance of the adjacent healthy lobules, and were in no wise to be distinguished from them—becoming enlarged, and the air-cells on the surface easily distinguishable by the aid of a lens. The colour was changed from a dark violet to a light pinkish hue, such as is habitually seen in the healthy lungs of children. The lung substance was found then to float readily on water, and to have become crepitant. When these inflated portions were left to themselves for a short time, they became to a certain degree collapsed; the lung contracting and expelling a portion of the air artificially introduced. The inflation was performed with ease in most of the cases; in some, however, the force necessary to be used was more considerable, and some portions were not inflated at all by the additional force used. The portions

speech (House of Commons, July 8th), when he moved the second reading of the Pharmacy Bill.

which occasionally resisted full inflation were the posterior surfaces of the lower lobes.

The depth to which the lung substance was implicated was variable. In all cases the collapse exhibited a preference for the portions of the lobes most distant from the root of the lung—thus the margins of the lobes were found chiefly affected. A great part of a whole lobe was, in many cases, collapsed deeply as well as superficially; the upper lobes, however, were never found very deeply affected.

The anterior tongue-like prolongations of the two upper lobes were, in nearly all the cases, collapsed, and were thin, pliable, and *lobulated*, to the feel, if I may be allowed the use of such a term. The external surface of the upper lobes often presented little digital pits or depressions, the depressed surfaces being of a colour approximating to violet, and constituted by lobules in a semi-collapsed state. Inflation quickly gave the lobe a uniform, smooth surface.

Such was the general appearance and character presented by the collapsed portions. In many of the cases these portions were themselves the seat of other alterations, to which I shall now allude. The collapsed portions, in several instances, were spotted on the external surface, which was due to the fact that certain air-cells, either singly or in groups, were distended with a muco-puriform fluid. They were chiefly seen on the external surface, but a section also showed them, though less distinctly. The patches thus constituted were of a variable size, but mostly as large as a millet seed, very slightly elevated above the surface, of an opaline grey or yellowish colour. On pricking them with the point of a lancet, a small quantity of puriform fluid

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exuded, and the little eminence disappeared. They were very different in appearance and general characters from tubercular deposits, for which, however, they might, at first sight, have been taken. They were identical with what has been described by Legendre and Bailly as the first and second stages of their catarrhal pneumonia. Section of the lobules affected in this manner exhibited similar spots or patches. A further stage of this process was exhibited in some of the cases, where cavities of a larger size were found occupying the terminal extremities of the bronchial tubes. They were, for the most part, scattered, and not very numerous, always situated in portions of the lung which were collapsed. In one case (No. XII.) a very advanced stage of this condition existed. A large portion of the lobes of both lungs were, in this instance, occupied by cavities, some of which were large enough to admit a small marble, and communicated freely with the bronchia. The external surface of the lobes thus affected, presented large elevations of a rounded character, very much resembling small bladders. These cavities contained pus and air mixed together. When dried, the lung presents a honeycomb appearance, as is well seen in the preparation exhibited. Several adjacent air-vesicles affected with catarrhal inflammation have evidently coalesced, the walls between them having been destroyed. In the recent state, the cavities were lined by a reddish membrane. A portion of the middle lobe was in this case unaffected, and the contrast between the two portions is very remarkable, the line of demarcation between the healthy and diseased portions being quite abrupt. There was no induration of the lung substance surrounding these cavities, and nothing besides the thin wall of the air vesicles intervening between them and the pleura.

The case from which this specimen was taken was one when the disease had lasted some time. The cavities in question resembled very much the vesicles of emphysema, from which, however, they differed in containing pus as well as air, and in other particulars. Barrier first pointed out the true nature of these cavities, which are called by the French observers "vacuoles," by others "bronchial abscesses." It is very rare that these are seen so large and well marked. Dr. Alderson, in the paper I have before alluded to, mentions the occasional existence of bronchial dilatations occupying the extremities of the bronchia in some of the cases of hooping-cough which he examined. These enlargements were doubtless identical with the vacuoles I have just described. In some other cases which came under my observation, these vacuoles were found, but their size was not generally greater than that of a pin's head. True dilatation of the bronchial tubes was not met with in any of the nineteen cases; the dilatation was always terminal, and occupied the air-cells rather than the bronchial tubes.

The *mucous membrane* of the bronchial tubes was in some cases slightly injected. In almost all, the tubes were filled more or less by a muco-purulent fluid, rather tenacious in consistence, and in the tubes leading to collapsed portions non-aërated.

The air cells in the lobules immediately adjoining the collapsed portions were enlarged, although this enlargement was never found to be great in degree. It was, however, quite obvious with the aid of a lens. The space created by the collapse of certain portions, appeared to be filled up by a corresponding increase in the bulk of the parts adjoining; thus, in some cases, where the tongue of the upper left lobe was collapsed, it was tilted down-

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wards and backwards, while its position was occupied by an emphysematous portion of the remainder of the lobe.

True inflammation of the parenchyma of the lung was only seen in four cases. In one, a large portion of the upper right lobe was affected, and tubercle found in the bronchial glands. Hepatization to a slight extent, and confined to one or two lobules scattered here and there in the lung, was met with in one or two other cases. The bronchial glands were, in all the cases where attention was directed to them enlarged, congested, friable. In three of the cases they were infiltrated with yellow tubercle.

The state of the *pleura* was also observed. In five cases only were there any adhesions found, and in two of these the lungs were tuberculous. In one of these tuberculous cases, both pleural cavities contained a tolerable quantity of effused fluid, but no fluid was found in the other cases. No appreciable change was detected in the vagi nerves, although they were examined in most of the cases.

The *larynx* and *trachea* presented nothing remarkable; they contained generally a certain quantity of puriform fluid. The mucous membrane was never markedly injected.

In all these cases, then, the bronchial tubes were the seat of a catarrhal inflammation, affecting chiefly the smaller tubes, and in many cases the air-cells themselves. An inflammation occupying the smaller air-tubes has been called variously capillary bronchitis, broncho-pneumonia, catarrhal pneumonia, vesicular bronchitis. The two latter terms seem the most appropriate, particularly as applied to the affection of the lungs which occurs in hooping cough. There would appear to be an intimate connection between this catarrhal pneumonia and collapse of the lung; the one seems to have an important influence in causing the production of the other. What has been improperly termed lobular pneumonia is, in reality, collapse of the lung, brought about by the catarrhal inflammation of the minute bronchia. It is not pneumonia at all in the true sense of the word. In the hepatization of pneumonia, the lung substance is enlarged, hard, firm, very friable, breaking down into a purulent-looking detritus on pressure; the cut surface is granular, and inflation produces no effect in restoring to the parts affected the natural appearance and physical character. The hepatized portions are non-crepitant, and sink in water, agreeing in these characters with the collapsed portions.

Too much importance can scarcely be attached to this distinction; and there can be no doubt that many cases in which collapse of the lung only existed, have been treated as if pneumonia were present, and therefore inappropriately. An antiphlogistic mode of treatment might suit the one kind of case, but it would tend to hasten a fatal result in the other.

An interesting question has next to be considered. What is the relation which bronchial inflammation bears to collapse of the lung? what, in fact, is the mechanism of the production of this latter condition? It is very obvious that the effects produced on the system at large by the non-aëration of a great portion of the lungs must have a very important influence in impeding the due oxygenation of the blood, and consequently in lowering the standard of vitality. We are therefore warranted in devoting some little attention to the consideration of this

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process, and in studying the conditions under which it ordinarily takes place. The question has received some attention from recent writers on bronchitis, although they have not more than casually alluded to the existence of collapse in fatal cases of hooping-cough. Dr. West states, that a feeble condition of the respiratory powers co-existing with a large secretion of mucus into the bronchi, is sufficient to produce collapse of a large portion of the lungs. Dr. Gairdner, in the papers I have before alluded to, gives what I consider to be a very lucid and satisfactory explanation of the mechanism by which collapse of the lung is produced; and his remarks on this point I shall now quote. Dr. Gairdner first points out the inaccuracy of Laennec's statement, to the effect that the inspiratory force is greater than the expiratory—the fact being that the expirative force is actually one-third greater than the other. The collapse of the lung is produced, according to Dr. Gairdner, by bronchial obstruction; the way in which this acts being explained as follows. Supposing a particular bronchus to be occupied by tenacious mucus, the air will more readily pass by this mucus *from* the air-cells than *to* the air-cells, and for these reasons: the expiratory force, in the first place, is stronger than the inspiratory; and, secondly, as the bronchial tubes progressively diminish in calibre as they approach the air-cells, the obstructive material will more easily pass towards the root of the lung than in the opposite direction. It will thus act as a kind of ball-valve, allowing the tube to be pervious in one direction only, and preventing the air from passing into the air-cells. The expiratory act opens the tube by moving it a little; the inspiratory act closes it. If the efforts of coughing are insufficient to remove the obstructing mucus, the result of a continuance of this process will be in the end to remove all the air contained in the lobules to which the obstructed bronchus leads. The experiments of Mendelssohn and Traube are confirmatory of the views entertained by Dr. Gairdner. These observers placed small shot and other small articles in the bronchial tubes of certain animals, and on killing the animals after some time had elapsed, they found that the portions of lung to which the obstructed bronchi led were collapsed and destitute of air.

It does not appear necessary, judging from the cases which I have myself observed, that the mucus which has this important influence in inducing collapse of the lung (if the theory of Dr. Gairdner be true), should be of a very tenacious character, in order that it may produce such an amount of obstruction as shall result in collapse of the lung.

Dr. Gairdner ascribes an important part in the causation of the collapse to a feeble condition of the general powers; the action of the respiratory muscles being thus weakened, and the act of inspiration inefficiently performed. He quotes the observations of Dr. Rees, who pointed out the influence exercised by the mechanical conformation of the thorax in young children in preventing a due perfection of the respiratory process. The peculiarity of this conformation is this—that the walls of the thorax are less firm and resistant than in adults, and in consequence of this the act of inspiration produces a falling in of certain portions of the walls instead of the opposite result, expansion. My own personal observations have enabled me to confirm this valuable remark of Dr. Rees. These and other arguments used by Dr. Gairdner, seem almost conclusive as to the truth of the theory by which he seeks to explain the production of collapse of the lung.

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It may be expected that children subjected to the bad influences of impure air and defective hygiene will be more liable to become affected with collapse of the lungs than children who have not these disadvantages to contend with. The vital functions are carried on with less energy under the former circumstances; the nervous centres, no longer supplied with a healthy nutrient fluid, do not maintain the accustomed perfect action of the processes which subserve to the preservation of life. The respiratory process, one of the most important of these, languishes, and if under these circumstances hooping-cough attacks the patient, and the air-tubes become filled with the catarrhal secretion, which is the invariable concomitant of this disease, there is not sufficient power left to effect either the due elimination of this obstructive material from the bronchi or the due expansion of the pulmonary lobules. If the child be very young, the conditions will be still more favourable for the production of collapse of the lung. The disease proves more quickly fatal in very young children; and, in the cases which I have observed, collapse of the lung was almost the only lesion found after death, up to about two years of age. In other cases, with the collapse were found further changes seated in the collapsed portions themselves—bronchial abscesses or vacuoles, etc., life having been prolonged for a sufficient time to allow of additional disorganization of the lung substance.

Some of the causes already mentioned are no doubt sufficient to cause collapse of the lungs in cases other than those of hooping-cough. Beyond the causes which have been alluded to, there is, in my opinion, another circumstance tending particularly to induce collapse of the lung in hooping-cough. The cough, which, from its peculiar character has given the name to the disease, consists of a series of short forcible expirations followed by a long-drawn inspiration; then again follows another series of expirations, immediately succeeded by an inspiratory act; and so on for a variable number of times, the whole series of successive expirations and inspirations constituting what is called the "fit"—the fit returning at intervals during the day, and with greater frequency at night. Now the effect of the numerous successive expirations must be to empty the lungs pretty completely of air, so far at least as the lungs can be emptied, this process having of course certain limits. I have counted as many as twenty-five expiratory efforts occurring consecutively before any inspiration took place. The inspiratory act which follows is, it is to be presumed, inefficient and incomplete; for the hoop which characterizes it must be held to indicate the existence of some impediment to the entry of air at the glottis itself. This again is a circumstance tending in the same direction, viz., to prevent air entering the lungs, and furthering the production of collapse of the lobules.

It may readily be imagined, that after this great expulsion of air from the air-cells, if the powers of the child be weak, some portions of the lung will not again receive their full complement of air, and, *à fortiori*, if portions of mucus not expelled are left to block up the entrance to the air-cells of these portions. I am not prepared to say in what proportion of cases of simple bronchitis in children, not connected with hooping-cough, collapse of the lung occurs, but I cannot help thinking that the universality with which this lesion was found to exist in the cases of hooping-cough which I have examined, points to the conclusion that hooping-cough has some especial influence in

producing the lesion in question; and if so, the explanation I have offered of the manner in which this influence is exercised seems a rational one.

As will be seen from what I have before stated, the fact of collapse of the lung occurring in cases of hooping-cough is not a new one; but the results of the *post mortem* examinations which I have now brought before you will, I trust, give a degree of positiveness and exactness to the opinion as to the existence of a connection between the disease and the lesion, in which it was before wanting. It is undoubted that collapse of the lungs is found in other catarrhal inflammations of the bronchial tubes; but it may be questioned whether it is, under any other combination of circumstances, so common as in the catarrhal inflammation which attends hooping-cough.

The due recognition of the connection between a catarrhal inflammation of the air-tubes, and collapse of the lung must have a very considerable influence on the question of the treatment to be adopted in such cases. It should be remembered, that the younger the child, the greater is the probability that the lungs will become affected with collapse, consequent on the affection of the air-passages.

Another question of great interest is the secondary effect of collapse of one portion of the lung on other portions not in the same condition. The observations I have made on this subject enable me to state that a secondary effect is produced, and what that effect is I will now go on to specify. As I have before remarked, the size of the air-cells at different situations on the surface of the lungs was examined with the aid of a lens, the result of such examination being to establish the fact that in the lobules immediately adjoining those which

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were collapsed, the air-cells were decidedly enlarged. The extent of surface which presented this enlargement of the air-cells bore a certain and constant ratio to the amount of lung which was collapsed; thus, when the collapse was slight in amount, the air-cells in the adjoining lobules were little altered, and *vice versâ*. These facts are strongly confirmatory of the opinion of Dr. Gairdner, as to the production of emphysema generally by collapse of the lung. The vacuum which would be formed in the cavity of the thorax by collapse of a portion of its contents, must necessarily be occupied by some solid or gaseous material, and it is obviously the most probable occurrence, that in order that this vacant space may be filled up, the lung substance near it will be further expanded, the air-cells becoming thus dilated, and emphysema produced. According to this theory, emphysema is a *complementary* lesion. Dr. Gairdner is of opinion that emphysema is always produced in this way. This may or may not be the case; my own observations are not sufficiently numerous to enable me to give an opinion. Thus much may, however, be with truth stated, that in those of the foregoing cases in which emphysema was observed, this theory seemed the only adequate explanation of the appearances which presented themselves.

If the subject be attentively considered, it will, I think, be seen that there is a reason for the persistence of the emphysematous condition, supposing it to have been once produced. If the portion of lung affected with collapse remain in this condition for any length of time, and the adjoining lobules are at the same time emphysematous, the existence of this emphysema will tend to prevent the collapsed portions from resuming their natural condition, and the evil will be perpetuated. The thorax is occupied

by the necessary bulk of lung substance, and the inspiratory efforts will have no effect in dilating the collapsed lobules, unless they are more forcible than usual, and perhaps not even then; for the powers of the system are generally so reduced and debilitated by the influence of the disease, that none of the functions are carried on with their usual activity and force. The emphysematous condition may thus continue, rendering the patient, during the remainder of life, affected with this strictural lesion, and its well known concomitant, chronic bronchitis. I have had very recently under my care a little boy, who, since he was the subject of hooping-cough some years ago, has been liable to severe and frequent asthmatic attacks. There is in this case emphysema of the lungs, and this condition seems to be the result of some such a process as I have endeavoured to describe.

The *symptoms* which present themselves during life, and which are observed in cases where collapse of the lungs is found after death, I will now briefly allude to; my remarks applying, of course, to cases of hooping-cough only. The respirations are very much quickened, being often as many as seventy-five or eighty in the minute. The character of the respiration is peculiar. The patient seems to labour very little compared with what would be expected from the frequency of the respirations, and with what is observed in other acute affections of the lungs; but the inspirations seem to be cut off and shortened abruptly, before much expansion of the thorax has been produced—the respiration may be characterized as shallow and imperfect. The examination of the chest shows absence of the usual resonance on percussion in certain regions, varying in degree in all cases. The regions at which this dulness may be expected to be found, are the inframammary in front, and the lower portion of the thorax behind, corresponding, in fact, to the surface of those parts of the lungs which after death are found most frequently affected with collapse. This dulness often appears suddenly; the chest may be perfectly resonant at a particular spot one day, and an observation made the day following may afford evidence of the existence of considerable dulness on percussion at the same place. Coincidently with this change, the general symptoms will become worse, the respiration more frequent. It is at all times more difficult in children than in adults, to establish satisfactorily the limits of a certain dulness, for the dull sound heard on percussion may be due, not as would appear at first sight, to solidification immediately beneath the finger, but situated more or less deeply in the thorax, and transmitted to the surface. The effect of the existence of enlarged bronchial glands in producing this result is well known to those much accustomed to the physical examination of the lungs in children. In the case of collapse of the lung, however, it will be more easy for the observer to satisfy himself as to the nature of the dulness arising therefrom, inasmuch as it will be found to exist over parts of the lung farthest removed from the bronchial glands; viz., the periphery of the lobes. This dulness may only exist for a time, and then pass away, the lung returning to its natural condition—a change, however, which I have unfortunately not often observed.

The dulness is one sign; another is the more or less complete absence of the usual vesicular murmur, and a substitution for it of a finish subcrepitant rhonchus; this rhonchus also varying extensively in degree and character as the tubes in the immediate neighbourhood happen to be filled with mucus or free from it. And this last is an

important circumstance, influencing as it does very considerably the nature and character of the sounds heard during auscultation. A limited portion of the surface of a lobe may present very different physical conditions; one part may be emphysematous, another collapsed—and this latter portion may perhaps contain the little terminal cavities, denominated bronchial abscesses. It is not to be wondered at, then, that so much variety is observed in the nature of the sounds heard through the stethoscope; these different conditions must give rise to different sounds, which the ear is incapable of distinguishing, because they are all heard together. A fact worthy of great attention is, the suddenness with which the dulness arising from collapse of the lung makes its appearance; and I believe this to be of great service in the diagnosis of the occurrence of this particular condition, collapse of the lung substance. In one or two cases the skin was very hot, and the febrile disturbance considerable at the time of the supervention of the other symptoms which indicated the sudden production of collapse; but in most of the other cases, it was either not observed, or it did not exist, and afterwards the skin became cool, and without any febrile action being present. The pulse, though very quick, is very feeble. It must be remarked, however, that the age of the patient will have some influence in these particulars. If the child be very young, it will become sooner affected with collapse of the lung, the powers being less able to resist the producing causes; and under these circumstances less febrile reaction will be set up than when the child is older, and the disease continues longer. In the latter case, the powers of nature have greater effect in resisting disease, and it may be expected that an indication of this will be presented in the greater degree of pyrexia observed,

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together with the other symptoms which usually accompany the inflammatory affections of the lung substance, whether acute or chronic.

The question of the treatment of cases of hooping-cough where there is reason to believe that portions of the lungs have become collapsed, is one of great interest, and my limits will not allow of my entering upon it in this place. It is to be hoped that the further progress of pathological and other knowledge will, in the end, remove hooping-cough from amongst the number of those diseases treated almost solely on empirical principles, and that, in the end, such a knowledge of the disease in question will be arrived at as will enable the physician to treat this disease on scientific principles. If the facts which I have brought before you tend to throw some light upon a subject which has hitherto remained in a certain amount of obscurity, the end which I have had in view in detailing the results which have presented themselves to me will have been attained. The subject is one calling for much investigation, and it is only by patient inquiry after facts, in this as in other similar diseases, that we can arrive at a true indicative for the successful treatment of this affection.

17, Radnor-place, Hyde Park,
September, 1855.

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APPENDIX.

The *post-mortem appearances* in the cases alluded to in the course of the paper, will now be given in a short tabular form. The chief design of the table is to show the comparative frequency with which the different portions of the lungs were found affected with collapse; and from it the deductions previously mentioned relative to this comparative frequency have been drawn. A very short account of the duration of the disease, and of the prominent features of each individual case, is also given.

The "Nursery" of the St. Marylebone Workhouse contains infants under the age of two years. On arriving at this age, the children are sent to the "Infant school," situated in another part of the building. From the Infant School the children are conveyed, when ill, to one of the wards specially appropriated to children in the Infirmary; and when practicable, they are under like circumstances removed from the Nursery to the Infirmary. These observations are necessary, as without them the signification of the words "Infirmary" and "Workhouse" about to be used, would not be properly understood.

TABLE OF CASES.

No. of Case.	Name, Age, Account of Illness, etc.	Right Lung. Upper Lobe.	Right Lung. Middle Lobe.	Right Lung. Lower Lobe.	Left Lung. Upper Lobe.	Left Lung. Lower Lobe.	Bronchi.	Bronchial Glands.	Other Organs.
I.	Charles T., æt. 2 years; admitted into Infirmary, Feb. 14th; had had hooping-cough one week; on Feb. 24th, sudden dyspnœa and œdema of lower extremities was observed; died Feb. 26th, rather suddenly.	Lower and anterior borders collapsed; air-cells adjacent enlarged.	A small portion collapsed.	Whole of lower margin collapsed.	Whole of posterior surface collapsed.	A small portion of the margin below collapsed.	Do not contain much mucus.	Not examined.	Liver congested; urine in the bladder contained a little albumen; kidneys congested; brain soft; slight amount of sub-arachnoid effusion, none in ventricles: pleuræ slightly adherent.
II.	Thomas S., æt. 3 years; admitted into Infirmary in January for cough; hooping-cough noticed Feb. 12th; Feb. 19th, symptoms much worse; died Feb. 26th; last day or two hæmorrhage from bowels, and last day convulsions of one side of the body.	Anterior portion collapsed; minute yellow spots on surface of collapsed portion constituted by air-cells filled with secretion.	Slightly collapsed.	Lower portion collapsed, and containing numerous small cavities situated at the termination of bronchi; the cavities contain yellow purulent matter.	Anterior border collapsed; section of this portion presents small pale nodules.	Large portion collapsed; terminal dilatations of bronchi.	Contain a quantity of secretion	Much enlarged and congested.	Some of mesenteric glands contain cheesy tubercle; arachnoid contains one ounce serosity, ventricles of brain, each one drachm; a small calculus, the size of a pea, in each pelvis of the kidneys.
III.	Arthur G., æt. 2 years; admitted into Infirmary, Feb. 1st, with slight cough; on Feb. 27th, a hoop was first heard; March 1st, convulsions and dyspnœa set in; died March 5th.	For the most part healthy.	A very small portion collapsed.	Whole of lower margin and a good portion of posterior surface collapsed. The collapse extends deeply, involving half of the lobe; collapsed parts are congested; one small portion could not be inflated.	Considerable portion collapsed, chiefly lower portion.	Nearly whole of lobe collapsed, and very considerably congested.	Contain but little mucus	Not examined.	Head very large, having same external measurements as the head of a youth aged 18; slight sub-arachnoid effusion; one ounce of fluid in arachnoid; grey substance has peculiar gelatinous look; thymus gland very large.
IV.	John B., æt. 2, died March 5th; had been the subject of hooping-cough in common with several infants in the nursery of the Workhouse for a week or two.	Apex has a puffy appearance due to enlargement of air-cells; lobe contains one portion the size of a pea, friable and injected.	Anterior portion wholly collapsed.	Lower border collapsed.	Apex similar in appearance to that of right lung; anterior border and tongue collapsed.	Lower border and under surface extensively collapsed, involving greater portion of lobe.	Contain much muco-pus.	Enlarged, congested.	
V.	Margaret H., æt. 9 months, spoon-fed from birth; has been brought up in nursery of Workhouse; died March 10th, after having had hooping-cough for one month.	A portion of the anterior border, the size of a pigeon's egg, hard and condensed, hepatized; section of a dull yellow colour; a portion of this hard mass is brightly injected, and a third portion has all the characters of collapsed lung. The latter portion inflatable, the former not so.	Condition not noted.	Extensive collapse of lower border and under surface, involving quite half of the lobe.	A small nodule of pulmonary apoplexy close to pleural surface; otherwise healthy.	Lower border and under surface collapsed. As in the case of other collapsed portions, these emitted non-aërated muco-pus on squeezing.	Contain but little mucus.	Congested.	Mesenteric glands enlarged and congested.

TABLE OF CASES.

No. of Case.	Name, Age, Account of Illness, etc.	Right Lung.			Left Lung.		Bronchi.	Bronchial Glands.	Other Organs.
		Upper Lobe.	Middle Lobe.	Lower Lobe.	Upper Lobe.	Lower Lobe.			
I.	Charles T., æt. 2 years; admitted into Infirmary, Feb. 14th; had had hooping-cough one week; on Feb. 24th, sudden dyspnœa and œdema of lower extremities was observed; died Feb. 26th, rather suddenly.	Lower and anterior borders collapsed; air-cells adjacent enlarged.	A small portion collapsed.	Whole of lower margin collapsed.	Whole of posterior surface collapsed.	A small portion of the margin below collapsed.	Do not contain much mucus.	Not examined.	Liver congested; urine in the bladder contained a little albumen; kidneys congested; brain soft; slight amount of subarachnoid effusion, none in ventricles: pleuræ slightly adherent.
II.	Thomas S., æt. 3 years; admitted into Infirmary in January for cough; hooping-couch noticed Feb. 12th; Feb. 19th, symptoms much worse; died Feb. 26th; last day or two hæmorrhage from bowels, and last day convulsions of one side of the body.	Anterior portion collapsed; minute yellow spots on surface of collapsed portion constituted by air-cells filled with secretion.	Slightly collapsed.	Lower portion collapsed, and containing numerous small cavities situated at the termination of bronchi; the cavities contain yellow purulent matter.	Anterior border collapsed; section of this portion presents small pale nodules.	Large portion collapsed; terminal dilatations of bronchi.	Contain a quantity of secretion	Much enlarged and congested.	Some of mesenteric glands contain cheesy tubercle; arachnoid contains one ounce serosity, ventricles of brain, each one drachm; a small calculus, the size of a pea, in each pelvis of the kidneys.
III.	Arthur G., æt. 2 years; admitted into Infirmary, Feb. 1st, with slight cough; on Feb. 27th, a hoop was first heard; March 1st, convulsions and dyspnœa set in; died March 5th.	For the most part healthy.	A very small portion collapsed.	Whole of lower margin and a good portion of posterior surface collapsed. The collapse extends deeply, involving half of the lobe; collapsed parts are congested; one small portion could not be inflated.	Considerable portion collapsed, chiefly lower portion.	Nearly whole of lobe collapsed, and very considerably congested.	Contain but little mucus	Not examined.	Head very large, having same external measurements as the head of a youth aged 18; slight subarachnoid effusion; one ounce of fluid in arachnoid; grey substance has peculiar gelatinous look; thymus gland very large.
IV.	John B., æt. 2, died March 5th; had been the subject of hooping-cough in common with several infants in the nursery of the Workhouse for a week or two.	Apex has a puffy appearance due to enlargement of air-cells; lobe contains one portion the size of a pea, friable and injected.	Anterior portion wholly collapsed.	Lower border collapsed.	Apex similar in appearance to that of right lung; anterior border and tongue collapsed.	Lower border and under surface extensively collapsed, involving greater portion of lobe.	Contain much muco-pus.	Enlarged, congested.	
V.	Margaret H., æt. 9 months, spoon-fed from birth; has been brought up in nursery of Workhouse; died March 10th, after having had hooping-cough for one month.	A portion of the anterior border, the size of a pigeon's egg, hard and condensed, hepatized; section of a dull yellow colour; a portion of this hard mass is brightly injected, and a third portion has all the characters of collapsed lung. The latter portion inflatable, the former not so.	Condition not noted.	Extensive collapse of lower border and under surface, involving quite half of the lobe.	A small nodule of pulmonary apoplexy close to pleural surface; otherwise healthy.	Lower border and under surface collapsed. As in the case of other collapsed portions, these emitted non-aërated muco-pus on squeezing.	Contain but little mucus.	Congested.	Mesenteric glands enlarged and congested.

TABLE OF CASES—*continued.*

No. of Case.	Name, Age, Account of Illness, etc.	Right Lung. Upper Lobe.	Right Lung. Middle Lobe.	Right Lung. Lower Lobe.	Left Lung. Upper Lobe.	Left Lung. Lower Lobe.	Bronchi.	Bronchial Glands.	Other Organs.
VI.	George H., æt. 6 months: had apparently recovered from an attack of hooping-cough, was discharged from nursery of Workhouse; two days after re-admitted, being much worse; convulsions came on twelve hours afterwards, and the child died next day, March 14th.	Upper two-thirds healthy, lower third collapsed; surface of collapsed portions presents little greyish, slightly elevated spots, shown to be small collections of pus at the termination of the bronchia on being pricked. These portions have a *lobulated* feel, so to speak.	Upper part healthy; lower, collapsed and small collections of purulent mucus seen on the surface of latter portions.	Considerable sub-pleural ecchymosis, as if blood had been dropped on the surface; patches of these vary in size from a pin's head to that of a shilling; lower border collapsed and congested.	Anterior tongue collapsed; collapsed part has appearances described in right upper lobe.	Considerable sub-pleural ecchymosis; lower portion collapsed.	Contain much muco-pus.	Very large: deeply congested.	Liver pale, small; right lung adherent everywhere to ribs; left partially so.
VII.	George W., æt. 6 months; died March 15th, in nursery of Workhouse, having had hooping-cough a fortnight.	Air-cells large, giving lobe a puffy appearance.	Anterior third collapsed, and of a lighter violet colour than usual; small patches on surface containing pus.	Lower margin collapsed, as also greater part of posterior and under surface.	Air-cells large; lobe puffy, with depressed portions here and there; languette collapsed; air-cells on surface contain pus in certain situations.	One-fifth of lobe collapsed chiefly at lower margin and on posterior surface; extending to depth of half an inch.	Contain considerable quantity of muco-pus.	Large, congested, friable.	Liver congested; mesenteric glands large; six invaginations of small intestine, apparently post-mortem as to date of production.
VIII.	Charles D., æt. 5 weeks; died March 16th, having had a paroxysmal cough for two weeks, together with syphilitic affection; had been in nursery from birth.	Partial collapse of anterior portion; the remainder of lobe of deep reddish violet colour, — collapse with congestion.	Anterior part healthy; remainder collapsed and congested.	Four-fifths collapsed and deeply congested; a very marked specimen of this combination.	Upper part healthy; anterior tongue collapsed.	Nearly whole of lobe congested and collapsed; some portions not inflated by force used.		State not noted.	Syphilitic affection of skin.

No. of Case.	Name, Age, Account of Illness, etc.	Right Lung. Upper Lobe.	Right Lung. Middle Lobe.	Right Lung. Lower Lobe.	Left Lung. Upper Lobe.	Left Lung. Lower Lobe.	Bronchi.	Bronchial Glands.	Other Organs.
IX.	Mary W., æt. 9 weeks; died March 17th, after hooping-cough had lasted three weeks; brought up in nursery.	Whitish rose colour; air-cells large.	As upper lobe.	Portions of lower margin collapsed.	In upper half air-cells large; lower half collapsed.	Whole of surface collapsed; collapse does not extend very deeply.	Contain a dirty colored purulent fluid.	State not noted.	
X.	Sarah B., æt. 4 months, died March 22nd, having had for two or three weeks a cough of paroxysmal nature, presumed to be hooping-cough, although no hoop had been heard. Residence in nursery of Workhouse.	Tolerably healthy; air-cells rather too large.	Collapsed in patches.	Lower border affected with collapse.	Healthy.	Large portion of surface collapsed.	Contain but little secretion.	State not noted.	
XI.	Charles P., æt. 1 year; had had hooping-cough two months; diarrhœa for a week before death; died March 22nd.	Small portion collapsed.	Nearly the whole collapsed.	The whole of lower margin and considerable portion of surface collapsed	Surface pitted, the depressed portions being collapsed; anterior tongue wholly collapsed.	Lower margin and posterior surface collapsed.	Contain much rather tenacious mucus.	Large, congested.	Both lungs covered with false membrane, and adherent to ribs. Injection of free borders of valvulæ conniventes of small intestine.
XII.	Eliza L., æt. 2 years; admitted into Infirmary for hooping-cough, Feb. 12th; died March 24th, having become much emaciated; purpura hæmorrhagica and thrush existed for some days before death took place.	Part of the apex healthy; a second portion hepatized, enlarged, hard; section of dull yellow colour, friable. A third portion presents appearances identical in cha-	The lobe is light, and communicates a gurgling sensation on pressure; on the surface are seen large eminences, varying in size from that of a pea to a marble. The	Portion of border collapsed in patches; remainder of lobe presents, on section, small cavities, in character similar to those in the two other lobes.	Anterior tongue composed entirely of vacuoles; no induration of lung substance; walls of vacuoles, thin, constituted externally of pleura and a very thin membrane only.	All the lower part filled with vacuoles of large size; these are well seen on the surface, and, as in the other lobes, are well defined in outline in this position.	Filled with thick purulent secretion.	A large mass of bronchial glands surround bronchi occupied by cheesy tubercle.	Old adhesions of both lungs to pleuræ; liver almost white. Section under microscope exhibits little else than fat globules. No tubercle in mesenteric glands.

TABLE OF CASES—*continued.*

No. of Case.	Name, Age, Account of Illness, etc.	Right Lung. Upper Lobe.	Right Lung. Middle Lobe.	Right Lung. Lower Lobe.	Left Lung. Upper Lobe.	Left Lung. Lower Lobe.	Bronchi.	Bronchial Glands.	Other Organs.
		racter with those described in middle lobe.	eminences indicate cavities filled with air, and pus (vacuoles). They communicate freely with bronchi, and are lined by a reddish membrane. The lobe has the appearance of a honeycomb when the pus is washed away.						
XIII.	Henry T., æt. 22 months; had had hooping-cough one month; died March 27th, in nursery of Work-house.	Air-cells large, giving lobe a puffed-out appearance.	Almost wholly collapsed.	Greater part of lower margin collapsed, also internal surface.	Presents some patches of collapse.	Greater part of lower half collapsed.		Enlarged, congested.	Right cavities of heart filled with blood.
XIV.	Eliza J., æt. 11 months; had hooping-cough three weeks; symptoms became worse ten days before death, when sudden increase of dyspnœa was noticed; died March 29th.	Air-cells large, otherwise healthy.	Collapsed partially; small patches on surface containing muco-pus.	Lower margin collapsed.	At apex, air-cells, large; lower part collapsed; anterior tongue especially affected.	Lobe very small; whole of surface affected with collapse, which condition extends deeply. Section presents small collections of purulent mucus, situated at terminations of bronchia.		Very large, congested.	

No. of Case.	Name, Age, Account of Illness, etc.	Right Lung. Upper Lobe.	Right Lung. Middle Lobe.	Right Lung. Lower Lobe.	Left Lung. Upper Lobe.	Left Lung. Lower Lobe.	Bronchi.	Bronchial Glands.	Other Organs.
XV.	Susan B., æt. 5 months; ill seven days. Symptoms,—dyspnœa, cough, much thirst, great pallidity; died March 29th.	At the anterior surface are some light red patches of partially collapsed lung; air-cells of remainder of lobe larger than in other lobes.	Collapse of lower and posterior portions, similar in appearance to that in upper lobe; about one-fifth of the lobe involved.	Collapse of lower margin; air-cells adjoining enlarged.	Upper part emphysematous; the tongue-like process wholly collapsed.	Collapse of margin, and also of posterior and inferior surfaces, not, however, extending deeply; a little interlobular emphysema at lower border.	Contain moderate quantity of puriform mucus.	Large and much congested.	Body tolerably covered with fat, vessels of pia mater rather congested; cavity of arachnoid contains half an ounce of serosity; white substance of brain injected.
XVI.	Geo. J., æt. 10 months; died April 2nd, in Salisbury-street; has had hooping-cough severely; last two days convulsions.	Upper portion emphysematous; a small portion of lower border collapsed.	Entirely collapsed.	Lower border collapsed: scattered over the collapsed portion are some vesicles partially aërated.	Anterior portion collapsed; remainder emphysematous.	Lower border collapsed; several sub-pleural ecchymoses.	Contain non-aërated puriform fluid.	Slightly enlarged.	Softening of mucous membrane at cardiac extremity of the stomach.
XVII.	Amy F., æt. 4 years; patient of Dr. Sanderson's at Western Dispensary; died April 17th; had hooping-cough four weeks. Three days before death a sudden change noticed in conformation of chest, which became unduly arched in front. Convulsions two days before death.	Two-thirds of the whole, emphysematous; remainder condensed, firmish, covered with sub-pleural exudation, like that seen under arachnoid. This condensed part assumes characters of upper part on inflation. On section, numerous small cavities, size of small peas are seen; they contain pus.	Condensed, contracted, presents same characters as lower part of upper lobe.	A portion of lower margin collapsed.	Upper part markedly emphysematous; anterior tongue of dark violet colour, resembling in texture the middle lobe, and part of upper lobe of the right lung.	Contains several yellow-coloured granular bodies, which are lobules filled with pus. Lobes adherent together, and to the ribs in part.	Filled with pus, containing little air.	Very much enlarged and congested, not tuberculous.	The lung substance in the portions affected with collapse was harder than in other cases, resembling in some degree cirrhosis of the liver. Inflation did not dissipate this firmness, though restoring the affected portions to their outward natural appearance.

TABLE OF CASES—*continued.*

No. of Case.	Name, Age, Account of Illness, etc.	Right Lung.			Left Lung.		Bronchi.	Bronchial Glands.	Other Organs.
		Upper Lobe.	Middle Lobe.	Lower Lobe.	Upper Lobe.	Lower Lobe.			
XVIII.	Catherine H., æt. 4 years; patient in Infirmary; duration of disease somewhat uncertain; died of hooping-cough rather suddenly, April 14th.	All the lobes adherent together, imperfectly crepitant, though not collapsed.	See upper lobe.	See upper lobe.	Emphysematous at apex; no collapse, no tubercle; both lobes adherent behind to ribs.	Lower part occupied by a mass of yellow, white cheesy tubercle, enclosed in a kind of cyst: size of the mass, one inch by half an inch; upper part of lobe presents grey tubercular infiltration.	Contain a little pus.	Filled by tuberculous deposit; one gland projecting into cavity of bronchus on left side.	No tubercle elsewhere; liver pale, nutmeg-colour.
XIX.	Mary A. T., æt. 2 years; patient in Infirmary, admitted with a cough; had hooping-cough for five weeks before death; died April 14th.	Lobe studded superficially and deeply with yellowish grey granulations, very numerous on posterior surface; some patches of violet colour, collapsed.	As upper lobe.	As other lobes; there is a cavity in the centre of this lobe the size of a small nut, containing soft tubercle, arranged in a star-like form.	Anterior tongue collapsed on the surface, and scattered throughout lobe are numerous grey granulations, very hard to the feel.	Lower three-fourths collapsed: contains some granulations of tuberculous nature scattered here and there.		Very greatly enlarged; one on the right side one and a half inch long, filled with cheesy tubercle.	Both pleuræ contain fluid with fibrinous coagula: liver very pale. Peritoneum contains a turbid fluid.

FINIS.

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speech (House of Commons, July 3rd), when he moved the second
reading of the Pharmacy Bill.

A

PATHOLOGICAL INQUIRY

INTO THE

EFFECTS OF SYPHILIS

UPON THE

UTERINE ORGANS.

BY

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M.DCCC.LIV.

reading of the Pharmacy Bill.

A PATHOLOGICAL INQUIRY INTO THE EFFECTS OF SYPHILIS UPON THE UTERINE ORGANS.

The following communication contains a record of observations, undertaken for the purpose of determining the extent to which the uterine organs suffer from syphilis, and the character and type of the ensuing derangement. It is scarcely necessary to premise that such an inquiry is attended with many and peculiar difficulties. It is as difficult, on the one hand, to elicit a truthful narrative of facts from persons suffering from this disease respecting the history of their maladies, as it is, on the other hand, to determine the significance and relations of such facts, when truthfully obtained, to the many morbific influences with which they are associated, or by which they may have been preceded. The sufferers from syphilis are commonly those who have been exposed to the operation of many other causes besides syphilis, equally calculated to derange the uterine organs. Irregularities of living, sexual excesses, dissipation, destitution, and mental distress, are amongst some of the most constant; and, where so many conspire to a common result, it is difficult to assign the exact share of each in its production. Whilst, then, I believe that all inquiries undertaken with a view of determining the precise action of syphilis upon the uterine organs must to a certain extent be imperfect, I am yet not without hopes that some good may result from the attempt, and that a careful narrative of facts directed to this end, if not immediately decisive of the question, will at least serve as a basis for further investigation.

From the inquiries I have made, I am led to believe that the influence of syphilis in deranging the uterine organs is more considerable than is commonly supposed, and that the various forms of uterine derangement which result from this cause are but little known to or recognised by the profession at large. It is, however, very far from my intention to disparage the many valuable researches which have been published in this branch of professional inquiry. The morbid appearances of the cervix uteri, occurring in connexion with syphilis, have been carefully noted and accurately recorded; the influence this disease has in disturbing the reproductive functions has received considerable attention, as also its effects upon the offspring, both immediate and remote. But many questions remain to be solved. The several forms of functional derangement of the uterus which follow upon syphilitic infection, and their relations to physical and vascular changes of the organ, have not, in my opinion, been either comprehensively surveyed, or satisfactorily determined; and it is upon these subjects that I have more particularly sought for information. As already stated, my inquiries have not been altogether as conclusive as could be wished; but, believing that they have put me in possession of many facts, which are not only interesting in themselves, but important in their general relations to uterine pathology, I trust that no apology is necessary in submitting them to the notice of the profession.

The cases upon which the present communication is founded are eighty in number. Nearly all of them occurred in the practice of the Lock Hospital; and, for the opportunity of making the necessary observations and inquiries, I am indebted to the kindness of the surgeons of that institution. The histories of these cases; the condition of the uterine functions, before and after infection respectively; and the physical appearances of the cervix uteri, were in every instance noted by myself, and, with few exceptions,

speech (House of Commons, July 3rd), when he moved the second
reading of the Pharmacy Bill.

in the presence of the house surgeon, to whom my written report of each case was subsequently submitted for correction. I have stated this circumstance, because I am anxious to show that the record of facts embodied in this inquiry does not rest solely upon my own individual testimony, and that I was anxious to arrive at as truthful results as the nature of the subject permitted. Having thus collected all the facts I could rely upon, I proceeded in the next place to reduce them to a tabular form, placing under separate heads those relating to the syphilitic affection; to the state of the uterine organs before and after infection; to the physical condition of the cervix uteri; and to the state of the general health as observed in each case: and, from the tables so constructed, I proceeded lastly to deduce those general conclusions which it is the more especial object of this paper to submit to professional notice. With all the care that could be taken, I fear, however, that I have not avoided many sources of fallacy. As already stated, it is difficult to elicit the real facts of the case from persons suffering from syphilitic disease: nay more, there is often a strong motive for wilful misrepresentation; and many of the uterine derangements met with in syphilitic patients may with reason be imputed as much to sexual excesses, etc., as to the syphilitic poison itself.

Notwithstanding the magnitude of these difficulties, it does not appear to me that they should altogether debar the attempt. I have endeavoured to obviate some sources of error, by taking and contrasting the uterine history before and after syphilitic infection, rather than before and after prostitution. I have throughout closely questioned patients upon each particular fact bearing upon the inquiry, rejecting such as appeared to be doubtful; and I have endeavoured, by giving each series of facts in different groupings, according to the social condition of each patient, to allow of a distinction being made between the effects on the uterine organs, of profligacy and intemperance on the one hand, and those of the syphilitic poison on the other.

Believing the latter circumstance to be one of considerable importance to the present inquiry, I think it right to premise that, of the eighty patients whose cases I have taken, twenty-four were married, and fifty-six were single. Among the latter, it is reasonable to suppose that intemperance, irregularity of living, etc., might have co-operated with syphilis in producing any uterine derangements under which they may have suffered; but, in the instance of the former, such influences would be less likely to have prevailed.

With these preliminary observations, I proceed to observe that, of the eighty cases, in seventy-two some form of functional derangement of the uterus was present, and in sixty-four some physical abnormity of the cervix was observed on ocular examination. I will proceed, in the first place, to give a detailed account of these lesions, as they respectively relate to function and structure. The former class comprehends lesions of enervation, menstruation, mucous secretion, and reproduction; the latter includes lesions of the cervical mucous membrane, affecting its vascularity and integrity, and of the body of the cervix, such as hypertrophy and induration.

I. LESIONS OF INNERVATION.

It would appear that abnormal sensibility of the uterine organs is present in a large proportion of cases of syphilis. Of the eighty I have collected, it was present in thirty-six; and of these, in twenty-four it occurred during the periods, in ten in the intervals of menstruation, and in two it was present both during and between the menstrual periods. The cervix uteri was found morbidly sensitive on tactile examination in ten cases; and of these, in nine this condition co-existed with uterine pain, either during or in the intervals of menstruation.

The social condition of the thirty-six patients in whom this abnormity was present is as follows. Of the whole number, eleven were married, and twenty-five were single. Of the twenty-four in which pain occurred during menstruation, six were married, and eighteen were single. Of the ten in whom it was present in the intervals of menstruation, three were married, and seven were single. The two patients in whom there was pain both during and between the menstrual periods were both married.

Of the thirty-six patients above referred to, thirteen had experienced more or less pain during menstruation previously to contracting syphilis, which in the majority had subsequently increased. None of the remaining twenty-three are reported to have had any uterine uneasiness, either during or in the intervals of menstruation, prior to this event.

The general character of the pain experienced was of a subdued or subacute character; rarely was it very acute; and in many cases it amounted rather to a sense of uneasiness than positive suffering. In some cases, however, the pain was very great. In one patient, who had experienced none whatever before infection, there was intense uterine pain, extending to the groins and back, which was increased by sexual intercourse, and on going to stool. In another, who had experienced no menstrual pain before infection, menstruation was attended with very great suffering—so great, indeed, that "she could scarcely stand or contain herself during its continuance". In another, pain during menstruation, subsequently to infection, had been as acute "as if lancets were being run through her". These cases, however, it should be added, were strictly exceptional, and were all associated with marked tenderness of the lower part of the spinal column. Regarding them, therefore, as exceptional, and probably aggravated by accessional causes, I would repeat that the general character of the uterine pain met with in these cases, whether during or in the intervals of menstruation, was mild rather than severe, and that it amounted to uneasiness rather than to positive suffering.

Such, then, being the principal facts relating to this lesion, as observed in these cases, it becomes important in the next place to consider how far we are justified in referring it specifically to the action of the syphilitic poison,

speech (House of Commons, July 3rd), when he moved the second reading of the Pharmacy Bill.

rather than to the many other morbific influences to which syphilitic patients may be supposed to have been subjected. The solution of this question is attended with considerable difficulty, on account of its complexity, and the many sources of fallacy; and I fear that, in attempting it, I can only hope to arrive at an answer which may approximate to the truth.

In opposition to the probable dependence of this lesion upon syphilis, in the cases under consideration, it might be urged that the patients had been exposed to the operation of many other morbific agencies, besides the syphilitic poison, equally calculated to engender uterine disease. Of these, the most powerful would probably be sexual excesses or excitement; mental anxiety or depression; irritative disorder of distant organs, secondarily reflected upon the uterine; irregularities of living; and general deterioration of the health. Now, whilst it cannot be doubted that such causes are frequently in operation upon persons suffering from syphilis, and may co-operate with it in producing uterine disease, it yet appears to me, from the consideration of many facts, that they cannot be regarded as the cause of the lesion in the cases under examination; and I will proceed to state the grounds upon which I am led to adopt this opinion.

In the first place, I would point out the great proportionate frequency of this lesion in the cases whose histories were investigated, amounting to forty-five per cent. of the whole number—a frequency which I believe to be greater than prevails in the instance of other constitutional diseases.

Secondly, it is to be observed that of the thirty-six patients in whom it was present, twenty-three, or nearly two-thirds, had not experienced any uterine pain or uneasiness, before syphilis had been contracted, either during or in the intervals of menstruation. The absence of the symptom before, and its supervention after infection, without any other obvious cause, may therefore be regarded as furnishing an argument in favour of its syphilitic origin.

Thirdly, we may infer its independence upon sexual excesses, intemperance, and irregularity of living, from the fact that its proportionate frequency was not materially

reading of the Pharmacy Bill.

greater in single than in married women, so far, at least, as these inquiries have extended; for in the latter it occurred in forty-one per cent., and in the former in forty-four per cent. of all the cases taken. Now, if these causes had any share in its production, it is reasonable to suppose that its proportionate frequency would have been much greater among single and dissolute women, than among those who were married.

Fourthly, with regard to the influence of various uneasy states of mind, and causes acting generally upon the nervous system in its production, I may remark that this view is not sustained by an examination of the facts of these cases. Had the lesion in question so arisen, we may assume that it would have been associated with other manifestations of nervous disorder. But, so far is this from being the case, we find that in upwards of one-half, or fifty-two per cent. of all the cases, no other evidence of derangement of the nervous system was present.

Fifthly, its independence upon irritative disorder of distant organs, secondarily reflected upon the uterine, is an opinion which appears to be supported by the fact that the digestive organs, the most common seat or cause of such reflected irritation, were healthy, or at least not manifestly disordered, in the proportion of fifty-two per cent. of all the cases taken.

But further, whilst there are strong grounds for believing that these circumstances, individually, were not the cause of this lesion in these cases, there are others which go far to show that neither were they so collectively. For, in eleven per cent. of all the cases, none of them could be ascertained to have been in operation; and, bearing in mind that in all it had either followed upon infection or had been aggravated by this circumstance, we have the strongest reasons for believing that it must have been its veritable cause, if not in all, at least in a majority of these cases.

I have endeavoured to state fairly, in the preceding paragraphs, the circumstances which would most probably favour and oppose the theory of the syphilitic origin of this lesion in the cases under consideration. I do not, however, insist upon the accuracy of the views I have been led to entertain on this subject, and have endeavoured, I trust not unfairly, to support. Further observation must determine their validity; and in the meantime I would venture to submit that the following proposition is deducible from the foregoing facts and considerations :—That the syphilitic poison does under certain circumstances, and in certain cases, tend to produce a state of morbid sensibility of the uterine organs, manifested by uterine pain either during or in the intervals of menstruation, and this whatever may be the social condition, habits, or modes of life of the persons infected.

II. LESIONS OF MENSTRUATION.

The extent to which the menstrual function is disturbed by syphilis may be estimated by the fact, that seventy or seven-eighths of the patients, whose histories I have collected, were or had been suffering from some form of menstrual irregularity at the time of my inquiries; and that of these, in fifty no irregularity of this function had existed until the disease had been contracted. The following table gives a summary of the state of this function as it had been in each case subsequently to infection.

Menstruation	had been	entirely suppressed in	14
"	"	interrupted in	11
"	"	interrupted and painful in	3
"	"	interrupted, painful, and scanty, in	2
"	"	morbidly recurrent in	3
"	"	morbidly recurrent, excessive, and painful, in	1
"	"	morbidly defective in	6
"	"	morbidly defective and painful in	6
"	"	morbidly excessive in	3
"	"	morbidly excessive and painful in	6
"	"	painful in	9
"	"	generally irregular in	6
"	"	normal in	8
In two the patients were pregnant			2
			80

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The foregoing table exhibits the condition of the menstrual function as it had been subsequently to syphilitic infection in each of the cases I have taken; but it must be remembered that of the seventy in which irregularity had thus occurred, in twenty there had been more or less irregularity previously to this event. I propose, therefore, to exclude these from immediate consideration, and to confine myself to an examination of the lesion as it occurred in the fifty cases in which menstrual irregularity, which had not previously existed, followed upon syphilis. Of these, the following table exhibits the particular form of menstrual irregularity which occurred in each case.

Menstruation	had been	suppressed in	10
"	"	interrupted in	7
"	"	interrupted and painful	1
"	"	interrupted, painful, and scanty, in	1
"	"	morbidly recurrent in	3
"	"	morbidly recurrent, excessive, and painful, in	1
"	"	morbidly defective in	4
"	"	morbidly defective and painful in	5
"	"	morbidly excessive in	2
"	"	morbidly excessive and painful in	4
"	"	painful in	6
"	"	generally irregular	6
			50

Respecting the social condition of these fifty patients, I find that sixteen were married, and thirty-four were single; and, taking into consideration that of the whole number of cases whose histories were collected, twenty-four were married, and fifty-six were single, it follows that menstrual irregularity occurred in the proportion of sixty-six per cent. of the former, and of sixty-four per cent. of the latter after infection. A difference so trifling as to show that the irregularity observed in this function had little or nothing to do with the social condition or habits of the patients, whilst it affords an argument in favour of the opinion that it was specifically a consequence of syphilis.

The period at which this irregularity was manifested in the progress of the disease will be found to have varied in different cases; but upon the whole it would seem to have dated from an early period. In many, as in the instance of those in which there had been total suppression, it must have occurred almost immediately afterwards. The length of time, however, which had elapsed subsequently to infection in many of these cases led me to make some additional inquiries; and on consecutively questioning on this point six patients suffering from syphilis, the duration of which had not exceeded three months, and who had been quite regular previously, I found that in four menstruation had abruptly stopped from the first period, and that in the other two, in which it had continued, in both it had been attended with greater pain from the first, and in one had been much more profuse than previously to infection. The presumption, therefore, is that menstrual irregularity is commonly an early consequence of syphilis; but there are some exceptions to this rule. Of several cases in which the date of its supervention is mentioned, I find that in one it began at the second monthly period after infection; in another at the fourth; in another at the seventh; and in one at the fifteenth. These cases, however, I believe to have been in some degree exceptional. In the great majority in which I have been enabled to ascertain the date of the occurrence of this lesion, it has supervened during the earlier months of the disease.

The type of irregularity which follows upon syphilis is fully set forth in the preceding tables. It will be found to have presented considerable variation, but unquestionably to have been most frequently manifested in the form of suppressed, interrupted, or painful menstruation; indeed, more than half the cases tabled will be found to consist of these lesions, or of various combinations of them. Defective menstruation, either alone or blended with various other abnormities of this function, follows next in the order of frequency; whilst abnormally recurrent and profuse menstruation were more rarely present in these cases.

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In a large number of cases, especially in those whose duration had been longest, some abnormal appearance of the cervix uteri was present, the nature of which is set forward in the following statement. Of the ten cases of menstrual suppression, the cervix was perfectly healthy in three, and either red, abraded, or otherwise abnormal in seven. Of seven, in which menstruation had been interrupted, it was found healthy in three, and either red, abraded, or otherwise abnormal in four. In one case in which menstruation had been interrupted and painful, the cervix was abraded. In one in which menstruation had been interrupted, painful, and scanty, the cervix was red and abraded. Of three cases in which menstruation had been morbidly recurrent, in each the cervix was red, and in two abraded. In one case in which menstruation had been morbidly recurrent, profuse, and painful, the cervix was perfectly healthy. Of four cases in which menstruation had been morbidly scanty or defective, the cervix was healthy in two, enlarged in one, and red and abraded in the fourth. Of five cases in which menstruation had been morbidly scanty and painful, in two the cervix was perfectly healthy, and in three either red, abraded, or otherwise abnormal. Of two cases in which menstruation had been morbidly excessive, in one the cervix was healthy, and in one morbidly red and abraded. Of four cases in which menstruation was morbidly excessive and painful, in one the cervix was healthy, and in three, red, abraded, or otherwise abnormal; and of six cases in which menstruation was generally irregular, in one the cervix was healthy, and in five, morbidly red, abraded, or otherwise abnormal.

From these facts, it is sufficiently obvious that various deviations from the normal appearance and condition of the cervix uteri are met with coincidently with menstrual disorder in a large number of cases of syphilis. It would, however, be a serious error to deduce from this circumstance that such lesions of the cervix were the cause of the functional disorder; for, not to mention the opposing instances in which menstrual irregularity occurred in the absence of such lesions, it may be remarked that the abnormities of the cervix included various deviations in the colour and volume of the organ, both of which may be supposed to admit of great variation within the strict physiological limits of health; and that of the eight cases in which menstruation had continued regularly after infection, in seven some abnormity of the cervix was discovered on ocular inspection.

But further, a reference to the history of the earliest cases collected clearly proves that the functional derangement of the organ had preceded any vascular changes of the cervix. This is a point which it is important to establish; and I would therefore direct attention to the following particulars of the five most reçent cases of syphilis which were met with, and which serve also to show the probable mode and date of the transition of irritative or functional disorder into vascular disease.

Case i. M. P., aged 20, single, applied at the Lock, March 2nd, 1854, suffering from primary symptoms of about a month's duration. She had menstruated once since contracting the disease, but the quantity was greater than she had been previously accustomed to. The cervix was perfectly healthy, it was normal in volume, and the mucous membrane was of a pale colour, smooth, and free from any abrasion, excoriation, or tenderness.

Case ii. E. W., aged 21, married, was admitted into the Lock, March 9th, 1854, suffering from primary symptoms of about a month's duration. She had menstruated once since contracting the disease, but the quantity had been so considerable as to amount almost to flooding. The cervix was found to be pale, smooth, and free from any abrasion, or ulceration.

In the preceding cases the cervix may be considered to have been perfectly normal, or at least free from any vascular or structural disease; and yet in both some degree of menstrual disease may have occurred. In the two following, vascular disease would appear to have supervened; but in neither was there as yet any structural lesion present.

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Case iii. E. J., aged 19, single, applied at the Lock March 2nd, 1854, suffering from primary symptoms of about a month's duration. She had menstruated once since contracting the disease; and the quantity and duration were much the same as before, but it was attended with a great deal more pain. The cervix was normal in size, but its mucous membrane was of a diffused dingy red colour, and had a somewhat maculated appearance. No abrasion, ulceration, or lesion of continuity, was anywhere perceptible.

Case iv. E. T., aged 16, single, was admitted into the Lock Oct. 27th, 1853, suffering from primary symptoms of about six weeks' duration. She had been previously regular, but subsequently the catamenia had returned every fortnight. The mucous membrane of the cervix was abnormally red throughout, but there was no excoriation or breach of continuity.

These cases appear to illustrate the probable mode and date of the transition of irritative disorder into vascular disease; but in the following case, of perhaps somewhat longer duration, a further transition of vascular into structural disease is observable.

Case v. E. C., aged 18, single, was admitted into the Lock Feb. 16th, 1854, suffering from primary symptoms of about six weeks' duration. She had menstruated once since, but very scantily, and the duration was shorter than usual. The cervix was normal in size, and soft, but it was of a uniformly red colour; and around the os uteri there was a bright looking excoriation or abrasion.

It appears to me that the facts of these five cases, viewed in relation to each other, throw considerable light upon many questions connected with this inquiry. In the first place, they demonstrate that functional disorder of the uterus, so far from being consequent upon, is generally antecedent to, vascular disease of the cervix; and hence that, when both coexist, they are not related to each other in the order of cause and effect, but rather as parallel effects of some probably common cause. Secondly, the mode and the probable period of the transition of irritative into vascular, and this into structural disease, appear to be clearly indicated in the histories of these cases. Lastly, the absence of all inflammatory and diseased appearances of the cervix uteri in the earliest of these cases, in which functional disorder existed coincidently with primary syphilitic disease, establishes beyond doubt that the functional disorder was not dependent upon inflammation propagated to the cervix by continuity of structure from the seat of the primary actions of syphilis; and, consequently, that it was rather due to irritation of a more specific and constitutional character.

It is only necessary to remark further, in connexion with this lesion, that, bearing in mind the above circumstances —that sexual excesses had probably little to do with its causation in these cases; that it was met with in a very large proportion of them; that, in five-sevenths of all the cases in which it was present, no such irregularity had existed until syphilis had been contracted; that it was not presumably dependent upon vascular disease of the cervix, or any other very obvious cause,—a strong case is made out in favour of the opinion that menstrual irregularity is in many instances a direct consequence of the specific actions of syphilis upon the female economy.

III. LESIONS OF MUCOUS SECRETION.

Peculiar difficulties attend any attempt to determine the relations of abnormal mucous discharges from the genito-urinary mucous membrane of the female to particular causes; so readily are the secretions of these parts affected by a variety of circumstances. Moreover, in determining their relations to syphilis, there is this additional difficulty, that its actions are both local and constitutional; and hence abnormities in regard to these secretions may arise from the local irritation of the disease, rather than from its more specific and constitutional action, which it is our more especial object to ascertain. In the sequel, I propose to revert to this question; and, in the mean time, I will proceed to submit a statement of such facts relating to

speech (House of Commons, July 3rd), when he moved the second
reading of the Pharmacy Bill.

this lesion as were ascertained in the course of this inquiry.

Of the eighty patients suffering from syphilis, whose histories I have collected, forty-nine were or had been, at the date of my inquiries, suffering from leucorrhœa, after having contracted the disease. Of these, thirteen had not previously suffered at all from leucorrhœa; twenty-one had, but it had subsequently increased. In eight, there had been leucorrhœa to the same amount before and after infection. In four, there had been leucorrhœa after infection, in which its existence previously is not noted; and three had vaginal discharges, which were probably due to the primary actions of syphilis. Of the remaining thirty-one cases, seventeen had not suffered from leucorrhœal discharges subsequently to infection. In ten, the existence of this lesion is not noted; and in four it had existed before infection, and had subsequently diminished.

It follows, then, that forty-nine, or sixty-one per cent., of these patients were suffering from leucorrhœa in connexion with syphilis. But, subtracting from these eight in which there had been a corresponding amount of leucorrhœa before the disease was contracted, four in which its previous existence is not recorded, and three in which the discharges were probably occasioned by the local irritation of primary lesions, there remain only thirty-four cases in which the disease had either supervened upon syphilis, or had been manifestly increased after this event. Assuming, then, these facts to have been correctly stated, it follows that leucorrhœa occurs in connexion with, and as a probable consequence of, syphilis, in the proportion of forty per cent. of any given number of cases of the disease.

Restricting, therefore, my observations to the thirty-four patients in which this lesion either supervened upon or was aggravated by syphilis, it appears that eleven were married, twenty-one were single, and of two this circumstance is not recorded. It would thus appear certain that the social condition of these patients had little or nothing to do with its causation. In fact, its relative frequency was greatest in those whose social condition was the best; being in the proportion of forty-five per cent. of married women, and thirty-seven per cent. of those who were single.

I have referred to the importance of determining specifically the relations of this lesion to the primary or local and the secondary or constitutional actions of syphilis. Many of the cases, however, partaking of a mixed character, it is difficult to determine with accuracy this question; but I have ascertained that in fourteen of the thirty-four cases the patients were suffering from primary symptoms alone; and in twenty from secondary symptoms, associated in some cases with various local lesions. The proportionate number of cases, however, of primary syphilis being twenty-nine, and of secondary syphilis fifty-seven, out of the eighty, it follows that the relative frequency of this lesion was greater in the former than in the latter form of the disease, being in the proportion of forty-eight per cent. in one, and thirty-nine per cent. in the other.

I have treated of leucorrhœa in the foregoing paragraphs in the sense in which it is ordinarily understood by the profession; viz., as consisting in abnormal mucous or muco-purulent discharges from the genito-urinary mucous membrane, and, with the exception of discharges from syphilitic sores and other primary lesions, without any reference to its actual seat. But, in carrying out this inquiry, inasmuch as it became necessary to examine into the physical condition of the cervix uteri in every case, I was enabled to make a note of those in which an abnormal quantity of mucus was seen issuing from the interior of the cervix. This form of leucorrhœa, therefore, commonly known as cervical leucorrhœa, and by some regarded either as the essential disease or an important modification of it, admits of being analytically examined; and its relations to particular forms of syphilis, and to the social conditions of the several patients whose histories were taken, etc., is set forth in the following statement:—

A preternatural amount of mucus, of a viscid, stringy, tenacious character, was seen issuing from the interior of

speech (House of Commons, July 3rd), when he moved the second reading of the Pharmacy Bill.

the cervix uteri in forty-four, or rather more than one-half of the eighty cases. Of these, in thirteen the patients were married, and in thirty-one single; being in the proportion of fifty-four per cent. of the former, and fifty-five per cent. of the latter, of all the cases whose histories were taken. Fifteen of the patients in whom this lesion was met with were suffering from primary, and twenty-nine from secondary symptoms; which, having reference to the number of cases of primary and secondary syphilis, respectively taken, gives a proportion in favour of its greater frequency in the former, in the ratio of fifty-six to fifty-one per cent.: a difference, however, too trifling to justify any practical conclusion.

I have not thought it necessary to enter into an examination of the relations of this lesion to abnormal states of the cervix uteri; because, on the one hand, the relations of functional disorder to structural disease of the uterus will form the subject of a separate inquiry; and, on the other, because no deductions bearing upon the subject of this paper could be drawn from such proceeding. It must be obvious that irritative disorder of an organ will, if long continued, ultimately give rise to vascular and structural disease, whatever may have been the character of the original irritation, whether common or specific. Admitting, therefore, that vascular disease of the cervix uteri was commonly found in connexion with leucorrhœa, no conclusion could be drawn from the circumstance in support of its syphilitic origin. Moreover, in considering this question in relation to menstrual disorders, I adduced several facts in support of the opinion that irritative or functional disorder preceded vascular change; and that, when both coexisted, they were rather to be regarded as the parallel effects of some common cause, than as respectively allied to each other as cause and effect. The analogy subsisting between the menstrual and other secretions warrants the same mode of reasoning and induction in regard to the mucous secretions of the uterine organs, and tends to show that derangements in these secretions constituting leucorrhœa have similar relations to vascular disease of the cervix. Without, however, entering further into this question, it is submitted that sufficient evidence has been adduced to establish the fact that leucorrhœa is a common and frequent consequence of syphilitic contamination.

IV. LESIONS OF REPRODUCTION.

In considering these, it will be most convenient to treat of them as they respectively affect the several functions of conception, pregnancy, parturition, and the offspring.

a. Affecting Conception. Of the eighty cases, in six only is it certain that conception occurred after infection; whilst in three others the date of conception and infection so nearly coincided, that it is impossible to say which had the priority. Of the remaining seventy-one, I have ascertained that fifty-two had never been pregnant either before or after infection; whilst nineteen had been pregnant before, but not after that event.

The social condition of the fifty-two patients who had never been pregnant, either before or after infection, is as follows:—Five were married, forty-one were single, and of six this fact was not accurately ascertained. Of the nineteen who had been pregnant before, but not after infection, thirteen were married, and six were single.

With the view of further determining the influence of syphilis in preventing conception, I have made the following calculation of the length of time which elapsed subsequently to infection without its taking place.

Of the fifty-two who had never been pregnant either before or after infection, in nineteen less than six months had elapsed; in fifteen more than six months and less than twelve months; in nine more than twelve months and less than two years; in two more than two years and less than three; in seven upwards of three years.

Of the nineteen who had been pregnant before but not after infection, in five less than six months had elapsed; in seven more than six and less than twelve months; in four

more than twelve months and less than two years; in three more than two and less than three years.

In considering these data, it must be borne in mind that, although the patients referred to were syphilitic, it by no means follows that sexual intercourse had on that account been abandoned: indeed, it would appear from various circumstances which have come to my knowledge, that infection alone is seldom a bar to its continuance; and that, in the instance of those whose intercourse is promiscuous, it is often continued for very lengthened periods after infection, and even during the existence of aggravated forms of the disease. It is in connection with such facts that the above data become alone either useful or instructive.

(*b*) *Affecting Pregnancy.* Of the eighty patients whose cases I have collected, twenty-eight had been pregnant; but of these twelve had been pregnant and delivered before the date of infection, and therefore no deductions can be drawn from them as to the influence of syphilis in modifying or disturbing the progress of pregnancy. This question, then, so far as my inquiries bear upon it, can only be determined by the histories of sixteen cases in whom pregnancy either preceded, followed upon, or occurred nearly simultaneously with infection, and I will proceed to consider it with reference to these three series of cases.

The cases in which pregnancy preceded infection amount altogether to six in number, and in all it proceeded to the full period without the occurrence of any unusual event. The cases in which pregnancy followed upon infection amount to seven; but, as in two pregnancy had occurred four times subsequently to infection, and in one twice, the absolute number of these pregnancies amounts to fourteen. Of these, in nine, it reached the full period; in two, it terminated at the eighth month; in two, at the seventh; and in one, between the fifth and sixth; menstruation having continued throughout. Of the remaining class in which pregnancy and infection occurred nearly simultaneously, amounting altogether to three, two patients went the full period, and in one pregnancy is still proceeding.

speech (House of Commons, July 8th), when he moved the second reading of the Pharmacy Bill.

These cases, then, so far as they go, would tend to establish a pathological fact of some importance, viz., that primary syphilis is less fatal to the completion of pregnancy than secondary or constitutional syphilis. For in all cases in which patients had primary syphilis or were infected during pregnancy, it proceeded to the full period; whilst out of fourteen pregnancies occurring in women who had been infected prior to its commencement, in five the child was expelled before the full period.

(*c*) *Affecting Parturition.* The sixteen cases I have collected of patients becoming pregnant either immediately before, after, or coincidently with infection, give in the aggregate twenty-three labours. Of these, in fourteen, no abnormity is noted; in three, it is stated that the labour was easy; in one, difficult; in three, attended or followed by inordinate hæmorrhage; in one, followed by a defective secretion of milk; and in one, pregnancy was still proceeding.

(*d*) *Affecting the Offspring.* Of twenty-two births, seven of the children alone were living at the date of my inquiries; and of these, five were suffering from some form of constitutional syphilis, leaving two only out of the twenty-two who had then the appearance of being healthy.

Of the fifteen deaths, the following gives the date and probable cause of death in each.

4 children were still born.
2 children died 17 hours after birth.
1 " a week after birth, with scaly eruption and sores, etc.
1 " 5 weeks after birth, with sore eyes and eruption.
1 " 3 months after birth, with ecthyma.
1 " 9 months after birth, with a tumour in the throat.
1 " 10 months after birth, with hydrocephalus.
1 " 10 months after birth, with eruption and coryza.
1 " 2 years after birth, with eruption, convulsions, and inflammation of lungs.
1 " 3 years after birth, of phthisis.
1 " 7 years after birth, of small-pox.

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Of the seven living children, five were or had been suffering, as follows.

3 had been subject to various eruptions ever since birth.
1 had been subject to sore throat.
1 had been attacked with inflammation, and vesication of the nates, vulva, and groins.

The date after birth at which morbid appearances first presented themselves, in sixteen children born alive, is as follows, so far as the circumstance is recorded in my notes.

2 looked sickly at birth, and died 17 hours afterwards.
1 was born at 7 months gestation, and died a week afterwards.
1 had sore eyes and an eruption at birth, and died 5 weeks afterwards.
1 died 3 months after birth, of ecthyma (date of appearance not noted).
1 died 9 months after birth, of tumour in throat, having been born healthy.
1 died 10 months after birth, of hydrocephalus (date of appearance not noted).
1 died 2 years after birth, of eruption, convulsions, etc., having been born healthy, and continued so for 18 months.
1 died 3 years after birth, of phthisis, having been born healthy.
1 died 7 years after birth, of small-pox, having been born healthy.

Of five living children suffering from constitutional syphilis:—

1 had never enjoyed good health, and had always been subject to eruptions.
1 became attacked 3 months after birth with a coppery eruption.
1 is 6 years old, but constantly subject to sore throat.
1 was born healthy, but has been subject to various eruptions.
1 was born healthy, but 10 months afterwards was attacked with inflammation, and vesication of the nates, vulva, and groins.

The above cases are too few in number to justify more than the conclusion that syphilitic children may appear perfectly healthy at birth, and remain so for some time afterwards. One of these children born apparently healthy remained free from any syphilitic appearance during six months; one during ten; and another during eighteen months.

Respecting the cause of death in cases of infantile syphilis, I may here mention the fact, that in three consecutive examinations of the bodies of young children who had died of this disease, in each extensive disease of the mesenteric glands was met with. No other lesion of the abdominal or thoracic organs could be discovered sufficient to account for death; whilst in none had there been any symptoms referrible to the brain during life. The pathological importance of this fact I do not presume to determine, but as it appears to support an opinion entertained, I believe, by many, that scrofula very often is but a degenerated or modified syphilis in the second generation, and points to the direction in which further inquiries may be usefully made, I have ventured to allude to the subject, and it may not be superfluous to introduce a brief outline of one of these cases, which will serve as a type for them all.

Case. M. A. F., a strong healthy-looking young woman, aged 21, was confined in the Paddington Infirmary, March 9th, 1854, and gave birth to a male child. She had reached the full period of pregnancy, the labour was natural and easy, and her recovery followed without an unfavourable symptom. The child was well developed at birth and looked healthy; but on the fourth or fifth day the mother noticed a small copper-coloured spot on the right nates. No notice, however, was taken of this; and on the 28th of March, nineteen days after delivery, both mother and child left the Infirmary apparently perfectly well. On the 11th April 1854, the child was brought to me by the mother, looking much out of health. It was somewhat emaciated; there was an extensive copper-coloured exanthematous eruption on his face, especially around the mouth, and a similar eruption on the arms, genitals, and around the anus. It appeared that the child had continued well for a week after leaving the Infirmary; and that then (on the twenty-sixth day after birth) some spots appeared around the anus

and upon the genitals, which rapidly multiplied and coalesced, so as to form red copper-coloured patches, and soon afterwards a similar eruption appeared on the face. The child took food, and the natural functions were properly performed. On the 14th of April, three days afterwards, and the twenty-ninth from the date of the child's birth, it refused the breast, began to fall off in health, and became fretful. From this time it rapidly lost flesh, slept badly, had green-coloured stools, and died on the 17th April, the thirty-fourth day after birth. On a *post mortem* examination, the only obvious lesion found was extensive disease of the mesenteric glands. They were enlarged and fleshy, had a dull red colour, and varied in size from a pea to a horse-bean; they felt firm on pressure, and on being cut, presented a red fleshy-looking appearance, but apparently contained no abnormal deposit. On questioning the mother as to her previous history, she stated that she had contracted syphilis six months before she had become pregnant, but at the date of pregnancy, as well as subsequently, she was not aware of having had any syphilitic symptoms, either primary or secondary. It should be added that during the period I watched her after labour, she appeared to be remarkably healthy and strong, and free from any strumous or scrofulous taint.

Passing from the subject of functional disorders of the uterus, I proceed to point out the structural lesions of the cervix which were met with in the course of this inquiry; and here it should be observed that no commemorative data exist, by which we are enabled to determine their exact relations to syphilis as distinguished from other causes, inasmuch as we have no means of ascertaining whether they had supervened upon or existed antecedently to infection. This question, therefore, will have to be decided by other means; and, in the meantime, it will be convenient to consider them as they respectively affect the mucous membrane and the body of the cervix, the former comprising more

speech (House of Commons, July 5th), when he moved the second reading of the Pharmacy Bill.

particularly lesions of the vascularity and integrity of the cervical mucous membrane, the latter hypertrophy and induration of the body of the cervix.

V. LESIONS OF THE MUCOUS MEMBRANE OF THE CERVIX UTERI.

a. Lesions of Vascularity. Of the eighty cases, in thirty-four the mucous membrane of the cervix was preternaturally red, either partially or generally. In forty, it was of a light or pale red colour; in six, the colour is not noted; and in twelve, it was either papular, aphthous, or warty. Of these, in six, or one-half, the mucous membrane was abnormally red or vascular; and in the remainder, of its ordinary pale salmon or rose colour.

The social condition of the thirty-four persons in whom the mucous membrane of the cervix was abnormally vascular or red, is as follows: six were married, and twenty-five were single; in three, this circumstance is not noted.

Whilst, then, it would appear that, in a large proportion of cases of syphilis occurring in the female, amounting to nearly one-half, abnormal redness or vascularity of the mucous membrane of the cervix is met with, whatever may be the social condition of the patients, I feel that considerable caution is necessary in deducing any inference from this fact. I am far from believing that we are as yet in a position to determine the limits beyond which this appearance is abnormal. The varying physiological conditions of the uterus, the periodical determination of blood to this organ, and its peculiar sensibilities and functions, all point to the probability that considerable variations from any given standard, in regard to colour or vascularity, may occur within the strict physiological limits of health. It is not, however, the province of this paper to enter upon, much less to discuss, these questions: it is rather my object to indicate things as they are, and to record as accurately as possible the phenomena of disease as I have met with them; leaving it for further investigators to reconcile them, to account for them, and to estimate their real value, as com-

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pared with former observations, or preconceived hypotheses or opinions.

b. Lesions of Integrity of the Mucous Membrane of the Cervix. In forty-eight cases, some abrasion, excoriation, or ulceration of this membrane, existed; whilst, in thirty-two, there was none, and it is reported to have been smooth, and free from any such appearances.

With regard to the character of these lesions, it may be observed that, with four exceptions, they appeared in the form of superficial abrasions or excoriations extending variously over the cervix, from the os uteri as their centre. In some, they were little more than a line in diameter; in others, they were extensively diffused over the cervical mucous membrane, having sometimes a granular fungous-looking surface, but seldom any well-defined margin. In this respect, they differed from ordinary ulcerations, and corresponded rather with abrasions or excoriations caused by an abnormal shedding of the epithelial cells of the part. In four cases, however, the appearances were somewhat exceptional. In one, there was a chancrous-looking sore, having defined edges, seated on the cervix, to the right of the os uteri; in a second, there were two well-defined superficial ulcers on the cervix, each having a yellowish dirty-looking base; in a third, there was a small granular-looking sore posterior to the os uteri; and, in a fourth, there were several aphthous-looking spots and excoriations on the cervix. I am unable to reconcile these exceptional appearances with any particular form or type of syphilitic disease.

The social condition of the forty-eight persons in whom these abnormities were met with is as follow: eighteen were married, and twenty-seven were single; whilst in three no record is made of the circumstance.

With reference to the pathological relations of these lesions to syphilis, I have already observed that their histories afford no specific data for determining this question, inasmuch as it was impossible to learn whether they had existed before, or had supervened upon syphilitic infection. We must therefore seek to determine it by some other means, and more particularly by comparing the relative frequency of these lesions, as met with in syphilis, with their frequency as met with in other diseases; and, adopting this course, we obtain the strongest grounds for believing that the lesions met with in these cases were specifically of syphilitic origin. The admirable researches of Louis on phthisis comprehend an inquiry into the state of the uterine organs in each case; and he states that, except in respect of dimensions, the condition of these organs, in persons who had died of this disease, was almost always natural. He found the uterus generally smaller than natural; but, even where there had been considerable irregularity in the menstrual function during life, it was found, with this exception, to be perfectly healthy. Throughout the whole of his work, no reference is made to the existence of vascular disease or ulceration of the cervix; and, bearing in mind his great accuracy of observation, and fidelity in recording morbid phenomena, we are compelled to conclude that in phthisis at least these lesions do not commonly exist, or, at all events, by no means to the extent to which they are met with in syphilis. An excellent paper by Mr. George Pollock, read before the Royal Medical and Chirurgical Society in January 1852, serves also to throw considerable light upon the subject. He records that, of five hundred and eighty-three women who had died of various diseases, in two hundred and sixty-five some disease of the uterine organs was met with, and yet in only twenty-three of these was the mucous membrane of the uterus, cervix, or os, found to be diseased or altered. Of seven hundred and eight cases of persons also dying of various diseases, of whom the uterine organs had been examined by Dr. Boyd, of the Marylebone Infirmary, in thirteen only was there congestion or inflammation of the uterus present. Dr. Allen, of the same institution, and Mr. Prescott Hewett, of St. George's Hospital, have also investigated the condition of the uterine organs in a large number of persons dying of various diseases; and they respectively concur in the state-

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ment that these lesions of the cervix were rarely met with. Now, if we consider these facts, and compare the infrequency of these lesions in the case of persons dying of other diseases with their frequency in cases of syphilis, amounting to sixty per cent., we derive a strong argument from the comparison in favour of their syphilitic nature in the latter.

It might, however, be contended that, if these lesions were of syphilitic origin, they should possess specific characters, by which alone their nature might be recognised. I am very far, however, from being able to assent to this doctrine. We know too little of the nature and laws of the syphilitic poison to be able thus to argue from *à priori* considerations. The relations of morbid conditions of the cervix generally to syphilis have as yet been but imperfectly determined; and if it be true, as I strongly suspect, that the uterine organs extensively and specifically suffer from the *constitutional* actions of syphilis—as much so as either the throat, the skin, or the periosteum—then it appears to me unreasonable to expect that such constitutional or secondary affections should possess the specific characters of primary lesions. But further, as regards primary sores, I would inquire whether, with the exception of the Hunterian, their physical characters are in all cases so strongly marked as to justify our founding a diagnosis exclusively upon them? Do the manifold forms of inflammation of the throat, having undoubtedly a syphilitic origin, admit in all cases of a physical diagnosis? and is it not true that many papular, erythematous, and scaly eruptions of the skin, of a syphilitic nature, present themselves sometimes with characters so dimly marked as to render their nature, judged of from appearances, extremely uncertain? Now, if this be true in regard to lesions so easy of recognition, and which have so long engaged the attention of medical men, how much more difficult must it be to determine from appearances the nature of lesions which are not readily discernible, and which have not hitherto received a large share of professional attention. In such case, it appears to me most prudent to observe facts carefully, and to generalise cautiously; not blindly to adhere to certain theories on the one hand, because they have received the sanction of a great name or authority; or, on the other, to adopt and promulgate hasty conclusions; but to accept that view which is best supported by the clinical history, the sequence of morbid actions, and the character of associated lesions, in each case. If this be done, I am persuaded that much will yet be elicited respecting the history and nature of syphilitic diseases of the uterus, with which we are at present unacquainted; and I am greatly mistaken if the cervix uteri be not as frequently found to be the seat of secondary syphilitic lesions, as either the throat or the skin, or any other organ or structure upon which the constitutional actions of syphilis are known to become localised.

VI. STRUCTURAL LESIONS OF THE BODY OF THE CERVIX UTERI.

a. Hypertrophy. In the course of this inquiry, many cases were met with in which the volume of the cervix exceeded its ordinary dimensions. It has been customary to speak of this as constituting hypertrophy; and with many it is considered to be a very abnormal condition. I believe, however, that this opinion should be received with great caution, and that many deviations from the ordinary volume of the cervix may and do constantly occur within the strict limits of health. I proceed to state the proportionate frequency in which this abnormity was met with, with the respective circumstances of the patients in whom it occurred; and I shall then add briefly the grounds which lead me to believe that it had little to do with syphilis as its cause.

Of the eighty cases, in thirty-one the cervix uteri was unusually increased in volume; in thirty-seven, it is said to have been normal; and in twelve no reference is made tc this subject. Of the thirty-one in which it was increased,

in eighteen the patients were married, in ten single, and in three the social condition is not mentioned.

The greater relative frequency of this condition of the cervix in married than unmarried women is the most striking circumstance in the history of this lesion in these cases; and it at once suggested to my mind a strong doubt as to whether it had any necessary connexion with syphilis. On further investigating the histories of these cases, I found that, of the eighteen married women in whom it occurred, fourteen had borne children, and four only had not. This fact would therefore favour the conclusion that its causes were rather connected with child-bearing than with syphilis, and that it may, in many cases, be reasonably imputed to such circumstances as interfere with the normal involution of the uterus subsequently to parturition.

b. Induration. Of the eighty cases, induration of the cervix is only noted as a distinct abnormity in eleven; and in thirteen only is the cervix distinctly stated to have been soft, normal, and free from induration. Of the remaining cases, I have no specific data. My observations on this point are hence very imperfect; but I am led to believe, from the general though not particular attention paid to this subject, that it does not occur to any considerable extent in syphilitic patients; and that, when present, it has only indirectly any relations to syphilis. Of the eleven patients in which it was met with, six were married, four were single, and in one the social condition is not mentioned.

The greater comparative frequency of this lesion in married than single women is again worthy of notice, and, coupled with the fact that four out of the six in whom it occurred had borne children, would suggest the conclusion that it, like hypertrophy of the cervix, had its origin in causes connected with child-bearing, rather than with the specific actions of syphilis. I must, however, be understood as not speaking positively on these questions. An abnormal condition of the nutritive functions of an organ or part may of course be excited by a variety of causes calculated to set up irritative disturbance; and, of such cases,

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some may be common, and others specific. I am not anxious to lay more to the charge of syphilis than it really deserves, and I trust, throughout this inquiry, that I have not, either by the statement or omission of facts, endeavoured to establish conclusions which further and more extended observation will not fully confirm.

VII. MALPOSITIONS OF THE UTERUS.

Besides lesions of the uterus affecting its function and structure, other abnormities were met with in the course of this inquiry, consisting of various malpositions or displacements of the organ, such as prolapsion, retroflexion, and deviations from its normal axis, as ascertained by the aid of the uterine sound. I am so fully persuaded, however, that these malpositions have no necessary connexion with syphilis, that I have not made any specific calculations respecting them. I would even go so far as to say that the uterus in regard to them is altogether a passive agent; and that the cause of these displacements is to be sought for rather in the actions and conditions of adjacent organs than in the uterus itself. It must be remembered, that this organ holds no fixed position in the pelvis, but is liable to have both its situation and axis altered or modified according to a variety of circumstances, more particularly the state of surrounding organs, and the pressure exercised by them upon it. Thus, the varying conditions of the urinary bladder in front, of the rectum behind, and of the colon on either side, may, under certain circumstances, alter its normal axis; whilst an over-distended state of the intestines above, from habitual flatulency or other causes, aided by a relaxed and atonic condition of the parts below, may give rise to and maintain various forms of uterine malposition, prolapsion, or displacement. I have satisfied myself that in many cases this has been the true history of such lesions; and the following notes of one, taken in the course of this inquiry, support the general correctness of this opinion:—

CASE. Elizabeth Homer, aged 18, was admitted into the Lock Hospital Jan. 13th, 1854, suffering from vaginal

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discharge and condylomata. On physically examining the uterus on Feb. 17th, it was found to be completely retroflexed, the cervix being immediately behind the pubis, looking downwards and backwards, and the fundus lying low in the pelvis, posteriorly to it. The displacement was attended with much uneasiness in the bladder, dysuria, pressure on the rectum, and painful defecation: there was also much constitutional disturbance, probably occasioned by the local suffering. It appeared to have occurred ten days previously, during a violent effort made to relieve her bowels. She had been suffering throughout the preceding day from great flatulency and constipation; and, whilst making an effort to relieve the bowels, she felt something give way and forced out of its place. This was immediately followed by great suffering; she felt faint, and was unable to walk: she was accordingly obliged to be carried back to her bed, and ever since had felt intense pain more or less constantly in the region of the pelvis.

Leaving, then, out of consideration all reference to malpositions of the uterus, and confining my observations to lesions of the functions and structure of the organ, I submit that it has been fully shown by the results of this inquiry that *the uterine organs suffer largely from or participate in the effects of syphilis upon the female constitution, and that such derangement is variously manifested by lesions of enervation, of menstruation, of mucous secretion, and of reproduction; whilst, in its progress, lesions of the mucous membrane and of the structure of the cervix are met with, the exact relations of which to syphilis are less obvious, and cannot so specifically be determined.* The pathological nature and relations of these lesions to each other will form the subject of a separate inquiry. In the mean time, I proceed to consider some questions which bear upon their general relations to syphilis: in particular, the earliest and latest manifestation of uterine disorder as a consequence of the disease; its relations to particular forms of it; its diagnostic characters; the occurrence of uterine derangement as a consequence of the transmission of constitutional syphilis to the female; and the effects of treatment upon such uterine maladies.

VIII. THE EARLIEST AND LATEST MANIFESTATIONS OF UTERINE DISORDER, AS A CONSEQUENCE OF SYPHILITIC INFECTION.

The most recent cases of syphilis met with in the course of this inquiry were three in which its duration had averaged about a month; and in each of these there was some functional disorder of the uterus. In one of these cases, the patient had menstruated once since infection; but the quantity had been greater than previously, and she had suffered more from backache and leucorrhœa. In this, the cervix was perfectly healthy; it was normal in point of size; and its mucous membrane was pale, smooth, and free from any abrasion, excoriation, or tenderness. In the second, the patient had menstruated once, and the quantity and duration were the same as before infection; but she had suffered more from pain and leucorrhœa. The cervix was normal in size, and free from any abrasion, excoriation, or tenderness; but its mucous membrane had a dingy red and somewhat maculated appearance. In the third, there was much uterine pain and tenderness of the cervix, attended with tenderness of the lower part of the spinal column. Menstruation had occurred once since infection; but the quantity had been very considerable; the cervix was enlarged (this patient had borne children), but it was of a pale colour, and free from any abrasion or other morbid appearances. In two cases, in which the duration of syphilis had averaged something less than two months, the functional and structural condition of the uterus was as follows. In one, the catamenia had returned every fortnight since infection, but more scantily than before; the os uteri was more patulous than natural, and a large quantity of viscid mucus was seen issuing from it; the mucous membrane of the cervix was abnormally red and slightly tender, but free from any abrasion or structural change. In the second, the patient had menstruated once since infection,

at the usual period, but scantily; and there had been occasionally backache. In this, the cervix was normal in regard to size, and not tender on pressure; but its mucous membrane was of an abnormally red colour, and around the os uteri, from which a large quantity of glairy mucus was protruding, there was a bright red looking excoriation.

Such are the dates of the earliest cases I have collected, and such was the state of the uterine organs and functions in each. They conclusively show that uterine derangement may occur in connexion with syphilis at a very early period, as early indeed as the first or second month after infection. It would further appear that the earliest manifestations of such derangement are of a functional rather than of a structural character, and principally consist in disordered menstruation and abnormal mucous discharges. It is moreover certain that such disorders are not occasioned by inflammatory or irritative disease of the uterus, either primarily developed, or continuously propagated to the organ from primary syphilitic lesions; inasmuch as, in the majority, the cervix was pale, and free from either vascular or structural disease. It should, however, be borne in mind that, in all these cases, the absolute date of the commencement of syphilitic disease is uncertain, and that it may have begun before the period assigned; the history of each case commencing only when the local symptoms had become of a marked and unmistakeable character.

With regard to the latest persistency of uterine disease as a consequence of syphilis, I may mention that my tables contain one case in which it had continued for a period of thirteen years, one ten years, one nine years, and another six years; two upwards of five years, one upwards of four years, two upwards of three years, and three upwards of two years. I need not particularise the duration of cases in which it had existed for shorter periods.

IX. RELATIONS OF SYPHILITIC DISEASES OF THE UTERUS TO THE LOCAL OR CONSTITUTIONAL ACTIONS OF SYPHILIS.

The question I propose more particularly to consider

speech (House of Commons, July 3rd), when he moved the second reading of the Pharmacy Bill.

under this head is the probable relations of the various uterine lesions met with in syphilis to particular forms of the disease; in particular, whether they are dependent upon its primary or on its secondary actions. It is, for instance, possible on the one hand to conceive that primary sores may either be developed upon the cervix, or that inflammatory irritation may be propagated by continuous sympathy to the uterus from the seat of other primary sores, in which case the consequent uterine derangement might be regarded as dependent upon the primary actions of the disease. Or, on the other hand, in the absence of both these conditions, it is possible that the uterine organs may suffer from the constitutional actions of the disease in a manner analogous to the skin, the throat, the eye, or the bones—the long series of morbid uterine actions or conditions, which I have described as occurring in syphilitic patients, being caused by the participation of these organs in the constitutional derangement occasioned by the syphilitic poison. Now, looking strictly to facts, and more especially to those which have come under my own observation, I think this question admits of the following answer: That in a small proportion of cases, not probably exceeding three or four per cent., primary syphilitic sores may be developed upon the cervix uteri, giving rise to various consecutive forms of uterine derangement; but that in the great majority of cases, amounting probably to ninety-six per cent., uterine lesions occurring in connexion with syphilis arise from its constitutional actions, and may in fact be regarded as so many secondary affections. I would submit the following facts in support of this opinion.

I. Of the eighty cases examined by myself, in three only were there any appearances on the cervix uteri at all of a specific character: in these, however, there were well defined chancrous-looking sores upon the cervix.

II. In the great majority of cases we do not observe any direct relations between the character and intensity of the local or primary syphilitic lesions and those of the uterus.

III. In the earlier cases of syphilis collected, although

there was already some uterine disorder, yet no abnormal vascular or diseased appearances were met with on the cervix. These cases have been referred to in the preceding section.

IV. In many cases, uterine derangement had continued long after the disappearance of the primary syphilitic lesions—a circumstance which would tend to show that the uterine organs were separately and specifically affected.

V. I would adduce in support of this view the greater analogy which it presents to the laws of other morbid poisons; no fact having been more clearly established than the rapid absorption of poisons when in contact with an absorbent surface, such as the mucous membranes; and, moreover, the weight of evidence appears to be in favour of the doctrine, that absorption of the syphilitic poison, and a consequent infection of the constitution, precedes the development of even the primary symptoms of the disease.

We may then, I think, reasonably assume, in accordance with well ascertained facts and received opinions, that in the great majority of cases the syphilitic poison is primarily absorbed and diffused throughout the system; and that, possessing certain elective affinities, it sooner or later leads to the development of various primary and secondary affections; amongst others, to the production of certain forms of uterine derangement or disease, in virtue of actions impressed by it on the uterine organs in its transit through the body.

X. THE DIAGNOSIS OF SYPHILITIC DISEASES OF THE UTERUS.

The derangements of the uterus met with in the course of this inquiry were of a twofold character—some being functional, others vascular and organic. I need scarcely observe, that the former possess nothing peculiar in themselves by which they can be distinguished from ordinary derangements of the uterus, arising from various non-specific causes. Irregularities of menstruation, especially sup-

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pression, uneasy feelings in the uterus, either during or in the intervals of menstruation, abnormal mucous discharges, with errors in the reproductive function, were the principal forms in which they were manifested; but abstractedly, these functional disorders possess no features by which their syphilitic nature can be determined.

Reverting then to the vascular and organic lesions of the uterus met with in connexion with syphilis, it may be observed that they also were of a twofold character—some affecting more especially the structure of the cervix, others its investing mucous membrane. Of the former, however, it will be sufficient to remark that their proportionate frequency of occurrence was but small, and that in all probability they had no direct or immediate connexion with syphilis.

Restricting then our attention to the vascular and other morbid appearances of the mucous membrane of the cervix, it will be found that they are referrible to three heads, under which I will separately consider them.

a. Abnormal redness or vascularity, either partial or diffused.

b. Lesions of the integrity of the mucous membrane, such as abrasions, excoriations, or ulcers.

c. Papular, warty, and aphthous appearances.

a. Abnormal redness or vascularity of the cervical mucous membrane was met with in thirty-four cases; but in none did it possess any distinctive characters by which its origin or nature could be determined. I have even ventured to doubt its pathological nature in all cases, believing that variations in the colour and vascularity of the cervix may occur within the strict physiological limits of health. It at least cannot be regarded as possessing any diagnostic value, in the great majority of cases in which it is met with.

b. Lesions of the integrity of the cervical mucous membrane, variously described by authors as abrasions, granular inflammations, and ulcerations, were met with in forty-eight

cases out of eighty; but with four exceptions they possessed no specific characters by which they could be distinguished from ordinary abrasions, etc., arising from various non-specific causes. In the four exceptional cases, however, they had a more marked, and I would add, diagnostic character. In one there was a chancrous-looking sore on the cervix, having well defined edges. In a second there were two well defined superficial sores on the posterior segment of the os uteri, having a yellowish surface or base. In a third there was a small granular sore with well defined edges, situated on the posterior surface of the cervix; and in a fourth there were several aphthous looking spots and excoriations scattered over the cervix. I have seldom met with these appearances in ordinary cases of disease of the cervix, and should therefore be disposed to regard them as specifically diagnostic of syphilitic infection.

c. Of papular, warty, and aphthous appearances of the cervix, twelve cases were met with. Of these, in nine they were essentially papular or exanthematous; in two, aphthous; and in one, small warty projections were seen seated upon the cervix. I believe these appearances to be unusual in non-specific diseases of the uterus, and should therefore be disposed to regard them, if not diagnostic of, at least as being calculated to raise a strong suspicion of syphilitic contamination.

Reviewing then the several physical lesions of the cervix met with in syphilis, in very few would it appear that they are sufficiently distinctive to justify our founding a diagnosis upon them. As regards mere lesions of colour and vascularity, we observe nothing diagnostic; of forty-eight cases of ulcerative disease, in four only did the ulceration possess any specific appearances; whilst admitting that a papular, aphthous, or warty appearance of the cervix is characteristic of syphilitic disease, in twelve only, or one-seventh of these cases, was it met with.

In the diagnosis, therefore, of syphilitic diseases of the uterus, it must be rather to the historical and coincident circumstances of each, than to the physical appearances of the

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cervix uteri, that we must look for assistance; and, it being admitted that our senses are commonly inadequate to the discrimination of syphilitic from non-syphilitic diseases of the organ, it becomes important to consider what are the circumstances in the history and progress of the one, by which we may be enabled to distinguish them from the other. I believe that the following are amongst some of the most important. 1. A well founded suspicion of impure intercourse or connexion. 2. The co-existence of affections of the throat, skin, or periosteum, similar to those met with in persons suffering from constitutional syphilis. 3. Repeated abortions without any very obvious exciting cause, or the birth of a child having eruptive appearances of a suspicious character. 4. Persistency of the uterine symptoms after the employment of rational and well directed measures of treatment, or a disposition to their recurrence after intervals of apparent cure. 5. The absence of those morbid states of the constitution out of which uterine disorder commonly arises. 6. Unusual complexity in the character of the uterine derangement. It will, I think, be found that attention to these and similar circumstances will afford the best, if not the only, guide to the diagnosis of diseases which are so similar in their appearance, yet so different in their nature, as syphilitic and non-syphilitic diseases of the uterus.

XI. ON THE OCCURRENCE OF UTERINE DERANGEMENT AS A CONSEQUENCE OF THE TRANSMISSION OF CONSTITUTIONAL SYPHILIS TO THE FEMALE.

One of the most important questions connected with the present inquiry, and one which it is most difficult to determine rightly, is the extent to which the uterine organs are liable to suffer from the transmission of constitutional syphilis to the female, either by the husband or by the fœtus *in utero*. I am aware that this is a subject upon which the greatest scepticism prevails, and one in regard to which it is difficult to obtain accurate information; but several cases which have come under my observation lead me to believe,

speech (House of Commons, July 8th), when he moved the second reading of the Pharmacy Bill.

not only in the possibility of such transmission, but that it is a cause of uterine disease which, although latent, is more widely spread in its operation than is commonly supposed. Before, however, entering specifically upon this subject, I will briefly consider the general question of the transmissibility of constitutional syphilis, to which, indeed, it is strictly subordinate.

To the general question, then, broadly stated, Can a female be infected by a person suffering from constitutional syphilis, without his having any primary symptoms, and without imparting any to the female?—I have no hesitation in recording an affirmative answer. I have the written histories of three cases by me, in which uterine derangement thus occurred shortly after marriage, without having previously existed, and in each had continued for a lengthened period. In neither had the husband any trace of syphilis at the date of marriage; but in each he had suffered from primary symptoms some time previously to this event, and in each the fact was confirmed by the occurrence of affections of the throat, skin, and periosteum, during the progress of the uterine malady, similar to those met with in persons suffering from secondary or constitutional syphilis. I have no room to enter into details; but, as the opposite opinion has been held by many eminent authorities, I would wish briefly to advert to one or two circumstances which, in my opinion, militate against it, and which do not appear to have been sufficiently considered by those who have maintained it.

It has been generally held that constitutional syphilis is not communicable, because many well directed experiments, performed both in this country and on the continent, and more especially by Hunter and Ricord, have established the fact that the pus or morbid secretion of a secondary lesion fails on inoculation to give rise to any specific affection. But, admitting the fact, two exceptions may, I think, be taken to the doctrine which has been deduced from it—that secondary or constitutional syphilis is never, under any circumstances, communicable: 1. That it by no means follows that, because no specific local affection results from such inoculation, therefore no constitutional infection takes place; and 2. That no experiments have, or ever can be, performed with the matter of secondary syphilis, in a manner at all analogous to that in which it is presumed that a husband, suffering from constitutional syphilis, may impart a syphilitic taint to his wife. The nearest approach to this mode of infection is that in which a syphilitic child, through the secretions of its mouth, may infect the nurse by whom it is suckled; and this fact, generally admitted, furnishes a strong argument in favour of the transmissibility of constitutional syphilis under certain circumstances.

But further, it is conceded that secondary symptoms may be transmitted from the parent to the child under many different circumstances. It appears to be clearly established, for instance, that the father being separately diseased, or the mother being separately diseased, may equally transmit them; and that the child *in utero*, being diseased through the father, may be the medium of communicating the disease to the mother. Now, if these facts are admitted, and they rest upon the testimony of some of the most accurate observers, we can scarcely hesitate to believe that constitutional syphilis may, under certain circumstances, be transmitted from one sex to the other. It is not, however, necessary to show, nor is it indeed contended, that any given lesion should be reproduced by inoculation—that the pus, for instance, of an ulcerated throat shall produce a specific ulcer of the part into which the matter is inserted, or that the matter of syphilitic ecthyma shall produce an ecthymatous eruption. All that is contended for is, that the repeated inoculation of such secretions may ultimately impart a syphilitic taint to the party inoculated; and this appears to be clearly shown to be possible by the cases I have referred to.

Passing, then, from the general question of the transmissibility of constitutional syphilis, I proceed to adduce the following facts and considerations in support of the doctrine that the uterine organs are thereby especially

liable to become disordered and diseased. 1. The cases already referred to, in which marked uterine derangement occurred after marriage; the husband in each having had primary symptoms some time previously, but none at the date of marriage, and in which other symptoms of constitutional syphilis subsequently supervened in the female. 2. The great frequency of uterine derangements in persons suffering from constitutional syphilis, as observed in the course of this inquiry. 3. The undoubted fact that abortions, premature delivery, and other errors in the reproductive function, do occur in persons suffering from secondary forms of the disease. 4. The frequent occurrence of inflammation of, and muco-purulent discharges from, the sexual organs of female infants born syphilitic. 5. The presumption that a morbid taint may be given through the medium of the seminal secretions, being granted, it follows that the uterine organs would be especially liable to suffer, in consequence of their immediate reception of such secretions.

Apart, however, from all theoretical considerations, it is certain that a man apparently cured of syphilis, and marrying a female of unquestionable character, may beget one or more children who shall be born syphilitic, notwithstanding that neither of the parents may exhibit a trace of the disease, either at the birth of the child or during utero-gestation. It is also certain that several abortions or miscarriages and premature labours may thus occur; and there are strong grounds for believing that under the same circumstances conception may be altogether prevented. Now taking these facts into consideration in connection with those brought to light by the present inquiry, especially the extreme frequency of functional and structural diseases of the uterus in persons suffering from syphilis—a frequency which, I believe, far exceeds that of any other secondary lesion—it appears to me to be impossible to doubt that the uterine organs do largely and specifically suffer from the actions of the syphilitic poison upon the female economy, and that the cause of the several errors in the reproductive functions referred to are more especially

speech (House of Commons, July 3rd), when he moved the second reading of the Pharmacy Bill.

to be sought for in the occurrence of such uterine disorder or disease—a disorder which it is quite consistent with analogy, and quite possible on other grounds, to believe may arise from the transmission of constitutional syphilis, and be set up in the absence of the more ordinary secondary forms of the disease. Let me not, however, be misunderstood in regard to the ultimate conclusions which I venture to deduce from these facts. It has been distinctly shown, as one principal result of this inquiry, that the lesions of the uterus met with in syphilis rarely possess any distinctive characters by which they can be diagnosed from non-syphilitic affections; nor, I would add, are we justified in any case in giving a positive opinion respecting them solely upon physical evidence. When, however, it is known that uterine derangement has followed upon marriage which had not previously existed,—when repeated abortions or other errors in the reproductive functions have occurred,—when also it is known that the husband had some time antecedently suffered from primary symptoms—when under these circumstances, such uterine derangement resists rational and well directed measures of treatment, and moreover becomes complicated with affections of the throat, skin, or periosteum, similar to those met with in persons suffering from constitutional syphilis—then it appears to me that we are bound to take the question into our most serious consideration; and if doubt or suspicion exists, to give the patient the benefit of such doubt or suspicion, by submitting her to that course of treatment which can alone eradicate the morbid taint under which she may be presumed to be labouring, and upon which her uterine ailments may be assumed to depend.

XII. THE RESULTS OF TREATMENT.

Under this head I am only anxious to direct attention to the extreme difficulty of eradicating uterine derangements consequent upon syphilitic infection, unless their true nature be properly recognised. I have recorded cases in which such derangements had continued for periods of six,

nine, ten, and thirteen years; and I have met with others in which they had existed for very lengthened periods. I have moreover observed that they have a tendency to recur after intervals of apparent cure. The practical inferences which I would venture to deduce from these facts are the importance, on the one hand, of investigating the functional and physical condition of the uterine organs in every case of syphilis before deciding upon its ultimate cure; and, on the other, the necessity of persevering in the employment of constitutional remedies so long as any evidence of any uterine derangement exists. I venture to urge these considerations with the greater freedom, because I have reason to believe that but little attention is commonly paid to the functional and organic condition of the uterine organs in the treatment of syphilis, and because I have met with cases in which marked uterine derangement had continued after the disappearance of all other traces of syphilitic disease.

The sketch thus imperfectly attempted of the several uterine lesions which follow upon syphilitic infection, will be further elucidated by a reference to the tabular analysis of cases which accompanies this paper.* In that analysis I have arranged in a tabular form all the principal incidents connected with the syphilitic affection,—the condition of the uterine functions before and after infection respectively,—the physical appearances of the cervix uteri,—and the reaction of any uterine derangement upon the general health in each of the cases whose history I have taken. To it, therefore, I would refer for any further details connected with the subject of this inquiry which the limits of the paper have obliged me to omit: I would also add, for the correction of any errors which may

* This analysis was presented to the Medical and Chirurgical Society with the present paper.

reading of the Pharmacy Bill.

have been committed in its compilation; for it is scarcely possible to avoid committing some errors in an inquiry like the present. For such errors, and it may be for many accidental omissions, I would plead in extenuation the inherent difficulty of the subject on the one hand, and the precariousness of the materials I had to work with on the other. There are few subjects in the whole range of medical inquiry so recondite or inexplicable as the operations of the syphilitic poison in the production of morbid actions, and there is none in regard to which it is so difficult to obtain accurate data. Impressed with this conviction, I began this inquiry rather as a pathological study than with any view to its ultimate publication; and I trust I may not be deemed unconscious of its many imperfections in finally submitting it to the notice of the profession.

T. RICHARDS, PRINTER, 37, GT. QUEEN STREET.

speech (House of Commons, July 3rd), when he moved the second reading of the Pharmacy Bill.

PATHOLOGICAL ANATOMY

CONSIDERED IN ITS RELATION TO

MEDICAL SCIENCE,

BEING

AN ADDRESS

DELIVERED AT THE ROYAL CORK INSTITUTION,

INTRODUCTORY TO A COURSE ON

PATHOLOGICAL ANATOMY AND HISTOLOGY,

BY

THOMAS S. HOLLAND, M.D., M.R.C.S.L.

CORRESPONDING MEMBER OF THE SOCIÉTÉ ANATOMIQUE,
AND OF
THE PARISIAN MEDICAL SOCIETY.

CORK:
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HODGES AND SMITH, DUBLIN.

MDCCCLII.

TO

THEODORE E. LADD, M.D.,

THE FELLOW-STUDENT, FRIEND, AND BROTHER

OF

THE AUTHOR.

THE Student has to look forward to a future in which his accomplishments must be of even a higher order than those required by the present generation—age after age extends the acquirements expected from those who practice Medicine—the necessity for Pathological and Histological knowledge is beginning to be admitted, and those who are to "fill our vacant places," should be convinced of its utility—for this purpose the following Address was delivered; while, with all its imperfections, I venture on its publication, in the hope that it may help to bring the subject under the attention of those who regulate the curriculum of Medical Education.

ADDRESS.

WE are here to-night, Gentlemen, to open, for the first time in the South of Ireland, a course of Lectures on Pathological Anatomy, with Microscopic demonstrations; surely, then, some explanation and apology is required, when a junior member of the Profession appears before his Seniors and the Public, to demonstrate the necessity for, and undertake the conducting of, so novel and important a course. At an early period of my studentship my attention was directed to the marks left by disease, and I endeavoured to avail myself of the opportunities afforded for their study, in the Hospitals of this city. In the Dublin Schools of Medicine I hoped to find the kind of information I most anxiously desired, but, with the honourable exception of the Pathological Society (whose meetings are ever open to the Student), pathological teaching was conducted on the same principle as in the school I had just left, viz., the physician under whose care the patient had been, offered some remarks on the case while his clinical clerk made the *post mortem* examination; then the most apparent or easiest demonstrated morbid appearances were exhibited and the diagnosis verified; but, Gentlemen, it cannot be considered as teaching Pathological Anatomy, to show a lung presenting this or that lesion which had been most accurately diagnosed, and then to hear, "it is unnecessary to open the abdomen as there is sufficient disease in the thorax to account for the symptoms and fatal termination." Let us for a moment put this assertion to the test; to-day a lung is shown, so destroyed by tubercular disease, that it were difficult to find a trace of its normal structure; to-morrow another lung is laid before the class presenting a few tubercles scattered through it, and a cavity large enough to admit a nut at its apex—in both cases the symptoms and death are presumed to be fully accounted for; but let us inquire, why did not the individual from whom the last lung was taken live until the organ would present the same amount of lesion as in the former case? Why did this man live so long, and that one die so soon? Why was the appetite in this case almost ravenous, even to the hour of death, and why had the latter so little desire for any kind of food? How are we to explain that the cough was only occasional in the former, while in the latter it formed the chief subject of complaint? How explain that diarrhœa weakened one, while no such symptom occurred in the other? Inquiries such as these were not answered by the mere examination of the thorax: would not these apparent anomalies have been explained had the contents of the abdomen and head been examined?—at least it were worth the trial—had Louis rested satisfied with such partial investigations, his book on Phthisis would have been a manual, not a philosophical treatise, answering

almost every inquiry that the minds of his readers may suggest. Again, a man falls from a height: he is taken up dead; the skull has been fractured—this caused the sudden death. But fractures far more extensive, and in the same position, occur, yet the patients recover. M. Legallois, however, has experimentally demonstrated, that if the point of origin of the pneumogastrics from the medulla oblongata be injured, instantaneous death is the result; this part was not examined, and if it had been, would the rupture of a few fibres of the cord explain the immediate death of both the sensatory and motor systems? That such an injury is on the instant fatal in almost all classes of animals, Flourens has fully shown. A case of Diabetes, after being for months in hospital, dies: the viscera are carefully examined, found perfectly healthy, and the only explanation that can be offered is, that he died of Diabetes; in other words, he died of the symptoms denominated by that term. But as our idea of disease is essentially connected with a cause known or unknown, a symptom, and an alteration or lesion of some organ, our inquiries should be directed to discover how the cause produced the lesion, and how it in its turn developed the symptom we have observed. I may be told, however, that in this instance such examinations are needless, for cases of diabetes have been again and again examined without organic change being found. Before we can admit such an assertion, we should inquire, was the state of the pancreas investigated—was the medulla oblongata healthy? for M. Claud Bernard has proved that puncturing the corpus olivaria, between the origin of the acoustic and pneumogastric nerves, produces diabetes in animals; but it remains for Pathology to test the value of this discovery, and to apply it to the explanation of the phenomena observed during life. Again, injury or puncture of the medulla, at a point not yet accurately defined, causes albumenuria: how great a change this discovery may yet produce, in the value of this sign as indicative of renal disease, clinical observation has yet to determine. The recent experiments of M. Melsen* have rendered it more than probable, that albumen exists in the fluids of the body under more than one condition, and that the presence of salts in the fluids materially modifies the action of the usual tests for this substance; his elaborate investigations will ere long be laid before you by Dr. Lyons;† and I am enabled to corroborate M. Melsen's statement, as I have failed in producing some of the most remarkable phenomena presented by albumen in solution, while experimenting on a highly albuminous fluid, drawn from a case of ascites.

In making these remarks, nothing can be farther from my intention than to disparage the Irish School of Medicine: one who has heard the names of the founders of that school in the mouths of students of all nations, like Household Words, would be the last to doubt the superiority of their minds and the practical value of their observations; as vain were it for me to endeavour to lower your opinion of our school as it is unnecessary to pass encomiums on those whose names stand high on the lists of science and humanity, and I should be ungrateful did I not acknowledge, that it is

* Ext. du tome xviii., No. 7, des Bulletins Acad. Roy. de Belgique.

† Dublin Quarterly Journal of Medical Science, Feb. 1852.

to Drs. Bennett and Gairdner o Edinburgh I am indebted for accurate and general ideas on this important subject, as also for my first instructions in the use of that instrument, without which we cannot obtain a perfect knowledge of this department of Medical Science, and non-microscopic descriptions of the anatomical lesions caused by disease are of that character which, though valuable some years past, are far behind the present state of science, and therefore unfitted for the age in which we live. Having, then, obtained in Edinburgh that essential element in all education, namely, instruction that brings the student up to the present state of knowledge, opportunites for continuing this study offered themselves to me, such as at present are not to be had at home. Returning to Dublin in last October, right glad was I to find, that the only branch of medical education not hitherto represented in Ireland had found a strenuous and able advocate, and that the Microscope had been brought within the reach of the students in this country by Dr. Lyons, whose "Apology for the Microscope," and articles in the Dublin Quarterly Journal are too well known and appreciated to require comment from me. Oft times, when my thoughts wandered homeward, I have felt assured, that the stimulus given to Medical education in this city by the establishment of the Queen's College, would ere long develope the necessity for special instruction on this subject, and that a course of Pathological Anatomy would be opened to, and gladly availed of by the students, whose increasing number proved, that Irishmen fully appreciated the advantages to be derived within th e walls of the new Colleges. Had this expectation been accomplished, my appearance here to-night would have been as unnecessary as presumptuous, and on the fact, that no one has come forward to teach the student the value of Pathological Anatomy, must rest my excuse for attempting to occupy a place, which no one seemed desirous of filling.

It now becomes my duty to enter into some historical details. The privilege of examining the dead was not allowed to the fathers of medicine, hence their investigations were of necessity confined to the lower animals, and we find Bonetius(*a*) frequently referring to such researches. Pliny(*b*), as referred to by Morgagni, Ded. Epist. lib. ii., informs us that in Egypt, under the Ptolemies, Herophilus and Erasistatus were permitted to examine the bodies of men, and some centuries after the physicians in Constantinople, during a plague, were allowed to search in the bodies of the dead for the cause, and thereby endeavoured to explain the symptoms.(*c*) Among the Moderns, according to Morgagni(*d*), it was first studied in Italy, and we are indebted to Benoit and Beniveni for many observations thereon. Jacobus Carpius(*e*), a few years after, palpably put forward the claims of this science; his example was followed by Massa(*f*), Fallopia(*g*), Eustachius(*h*), and we find the works of Lælius a Fonte and Panoroli referred

a. Sepulchretum Siva Anat. Practica, Geneva, 1700. Lib. 1., sec. viii.
b. I am unable to verify this quotation from lib. 19, sec. v. Hist. Nat.
c. See Historia Medicinæ a tempore Galeni usque ad initium sæculi Decimi cexti. Page 336, et seq., for an account of the Medical Schools of Alexandria, &c.
d. Ded. Epis. lib. ii.
e. Friend mentions in his Hist. Med., page 585, that Carpius made a hundred human dissections—" quæ res utpote istis temporibus inusitata existimatur mira et crudelis (vix credibilis?)."
f. Liber Introductorius Anatomiæ. Venice, 1536.
g. Opera Genuina Omnia. Venice, 1559.
h. Opuscula Anatomica. Venice, 1563.

to by Stahl. To them followed Vesale(*a*), Coiter(*b*), Spigelius(*c*), Bartholinius(*d*), Valsalva(*e*), Van Horne(*f*), and many others who studied at Padua.

In Germany, Hoffman(*g*), Boerhaave(*h*), Camper(*i*), and Haller(*k*), devoted part of their time and works to the elucidation of this subject, while Sylvius(*l*), Fernel(*m*), and Paré(*n*) in France; and in England Harvey(*o*), Glisson(*p*), Willis(*q*) and Mead(*r*), lent their aid in forming the new science; but unfortunately many of their works have disappeared, and some of their names are known to us only through reference made to them by more modern authors. Vesale's name is especially connected with all allusion to the past, as he had collected materials for, and even begun, a work on this subject, the completion of which he relinquished, disgusted with the envy and persecution of those who, as Fontenelle, in the preface of his "Histoire de l'Académie Royale des Sciences, 1699," informs us, "judged that what they did not themselves possess was superfluous

a. Opera Omnia Anatomica et Chirurgica. Lugd. Bat. 1725. The plates with which this edition is illustrated are fine specimens of art.
b. Tabulæ Principalium Humani Corporis Partium, &c. Norib. 1573.
c. De Hum. Corp. Fabrica, 1627; and Opera Omnia, Amsterdam, 1645.
d. Institutiones Anatomicæ. Ludg. Bat. 1645.
e. Opera Omnia. Venice, 1740.
f. Opuscula Anatomico-Chirurgica. Leipsic, 1707.
g. Opera Omnia Physico-medica. Geneva, 1748.
h. Methodus Studii Medici. Lugd. Bat. 1751.
i. Demonstrationes Anatomico-pathologicæ. Amsterdam, 1760.
k. Disputationes ad morborum historiam et curationem facientes. Lausanne, 1757 and 1766.
l. Morborum Internorum Curatio. Paris, 1545; and Opera Medica. Geneva, 1630.
m. De Abditis Rerum Causis. 1548. This work passed through 30 editions.
n. Œuvres Complétes, par M. Malgaigne. Paris, 1840.
o. Excitatio et Nat. de Motu Cordis et Sanguinis circulatione. 1628.
p. Opera Medica Anatomica. Lugd. Bat. 1691.
q. Opera Omnia Medica. Sugd. 1679.
r. Opera Omnia. Gottingen, 1749.

in others.(*a*)" Eustachius also, who as physician to an hospital had great opportunities for such investigation, lamented that illness prevented him from completing a work he had begun—while Coiter and Columbus(*b*) followed the example of their great master Vesale, and we find repeated references made in their works to the examinations they had conducted. At Geneva, in 1673, Bonetius published his Sepulchretum Anatomicum, in which he collected all the observations that had been made for years before. Nearly another century had passed when Morgagni gave to the world his great work, and with the Sedibus et Causis Morborum, first published at Padua in 1761, began a new epoch in this science, if indeed it can be considered to have existed as such before he wrote, and he pleaded as excuse for its appearing so slowly, that he was nearly eighty years of age when he revised the entire, and earned the high honour of being considered by posterity as the father of Pathological Anatomy. Lieutard(*c*) continued the same kind of researches, and in 1791 Vicq. d'Azyr wrote the article on this subject in the Encyclopédie Méthodique, which is as learned as it is immense, and will be referred to by all investigating the history of that science on which Baillie(*d*) published his book in 1793, and thus closed the past century. Since 1800 the progress of this department has become so incorporated with that of medicine, that it will only be necessary to mention the names of the authors to

a. Quoted by Morgagni, Ded. Epis. lib. ii.
b. De Re Anatomica. Venice, 1559.
c. Historia Anatomico-medica, sistens numerosissima cadaverum humanorum extispicia. Paris, 1767.
d. The morbid Anatomy of some of the most important parts in the human body. 1793. The seventh edition appeared in 1807.

recall their labours to your recollection. In England, Hewson, Carswell, Bright, Hope, Gulliver, Paget, Walshe, Simon, Jones; in Scotland, Monro, Hunter, Reid, Craigie, Goodsir, Bennett and Gairdner have successfully endeavoured to place British Pathology on a par with that developed in France by Portal(*a*), Bichat(*b*), Louis(*c*), Broussais(*d*), Andral(*e*), Cruveilhier(*f*), Lobstein(*g*), Rayer(*h*), Lebert(*i*); and in Germany by Meckel(*k*), Van der Kolk(*l*), Scherer(*m*), Puchelt(*n*), Vogel(*o*), Rokitansky(*p*), Henle(*q*), Gluge(*r*), Kölliker(*s*) and Förster.(*t*)

But why should an Irishman mention the works of his countrymen last—even our proverbial modesty would scarcely justify it; but the light we have thrown upon Diagnosis and Practice, serves but to make us feel more forcibly the contrast between the high position our school holds in these departments, and the unaccountable total absence of original scientific investigations, on a

a. Cours d'Anatomie Médicale, avec des remarques physiologiques et pathologiques. Paris, 1804,
b. Anatomie Pathologique. Paris, 1826.
c. Mémoires ou Recherches Anatomico-Pathologiques, &c.. Paris, 1826.
d. Cours de Pathologie et de Thérapeutique générales. Paris, 1829-34.
e. Précis d'Anat. Pathologique, Paris, 1829; and Clinique Méd. 1840.
f. Anatomie Pathologique du Corps Humain Paris, 1830—1842.
g. Traité d'Anatomie Pathologique, 2 vols. 1829—1833.
h. Traité des Maladies des Reins, avec Atlas, 3 vols. 1839.
i. Physiologie Pathologique, avec Atlas, 2 vols. 1845.
k. Handbuch der pathologischen Anatomie. 1812.
l. Observat. Anat. Path. 1826.
m. Chem. und Mikroscop. Untersuchungen zur Pathologie.
n. Das Venensystem in seinem krankhaften Verhältnissen dargestellt. Leipzig, 1843.
o. Icones histologiæ Pathologiæ. Leipzig, 1843.
p. Handbuch der pathologischen Anatomie. 1841—1846; and translated for the Sydenham Society, 1849—1851.
q. Handbuch der rationellen Pathologie. Brunswick, 1846.
r. Atlas der pathologischen Anatomie. Jena, 1843—1850.
s. Mikroskop. Anat. oder Gewebelehre des Menschen. Leipzig, 1850.
t. Lehrbuch der pathologischen Anatomie. Jena, 1850.

branch of research which has engaged the attention of some of the highest intellect in other countries. To what department of Scientific Medicine has not Mosse, Dun, Carmichael, Curran, Crampton, Graves, Stokes, Montgomery, Barker, Allman, Wilde, Kane, Aldridge, Sullivan, and other honoured names, added original and highly valuable observations? There is one exception to the long list of subjects which their genius has served to elucidate, and that is Pathological Anatomy considered as a Science, for no work on this subject has as yet issued from the Irish Press. True it is, that by avoiding the too theoretical tendency of foreign intellect, we have escaped the reproach of having ever given even temporary support to theories, that have not stood the test of time, or the still severer test of experience, yet while we may congratulate ourselves on having thus avoided Broussaism, Brownism, Humourism and Solidism, while Hydropathy and Hœmeopathy can with difficulty find an individual to espouse their cause, let us not rest in self-satisfied complacency, conscious of the high practical tendency of our School, and let it be remembered, that such general fallacies contain a certain, though a small, amount of truth, which is too often the basis on which is heaped a mass of error, as illogical as it is dangerous. For example: how greatly we are indebted to Broussais for having drawn attention to facts in Pathological Anatomy, which but for him would probably have long remained unknown, yet carried away by the spirit of the times, and by the striking character of his discoveries, he fell into the error of asking from the science to which he had imparted new life, what alone it could never grant, namely, the explanation of all the phenomena of disease; for, as the scalpel can only reveal the changes

in the solids, he lost sight of the fluid elements of tissue. We should keep constantly before us, that what is to-day purely scientific may be to-morrow highly practical, and that the apparent importance of a discovery forms no criterion whereby to judge of the advantages to be hereafter derived therefrom; for instance, a galvanic current was passed through a galvanic needle—it was seen to deviate from its usual position; here was a discovery of a purely scientific interest, the practical application of which has rendered it so intimately connected with the interests of society, that the advantages it has conferred on mankind are almost incalculable. A purely practical or exclusively theoretical system of medical education is injurious; like an acid or alkali, when apart, hurtful to a well-organized being, but like them, when combined, forming a compound perfectly free from the injurious tendency of either. Some of my hearers may consider, that Theory is only useful to explain what cannot be reduced to demonstration, but it has to accomplish a far higher purpose; it forms the nucleus, so to speak, around which stray facts accumulate, from which they derive their importance, and to which they are frequently indebted for their full developement. A theory carries with it defenders and opponents, and though at first sight their exertions may appear to have a directly opposite tendency, still they labour to attain the same object; for, to defend we must observe—to oppose we must observe—to argue successfully we must refer to the discoveries of others, and confirm or refute them by our own observations. It is by the conflict of mind against mind, that science is advanced, and on what ground is that contest so oft renewed as on the wide field of Theory, where observation ever comes to the rescue of truth. What the Newtonian and Atomic theories have done for the other sciences, the Cell or Cytogenic theory has done for Physiology and Pathology; for, as facts accumulate, the necessity for some means whereby their connexion and relation to one another may be demonstrated, and their relative value appreciated, becomes apparent, and on this their importance depends. The changeable character of theory has been again and again put forward as conclusive proof that it forms an injurious and even dangerous element in scientific education, yet it is on its Protean quality that its value in a great measure depends; it changes with the varying character of science, and is thus enabled to adapt itself and become useful to a variety of circumstances. I speak not of the finely-wrought theory, that is too often applauded, like the actor in Horace, before it has in any way merited such approbation, but of that based on, and deduced from, observation and experiment. There is nothing useful but may be abused; hence, theories whose use in medical science should have been confined to showing the connexion between lesions and symptoms, have been carried beyond their proper limits, and applied to Practice before they had received the impress of truth. The theological and metaphysical stages through which medicine, along with the other sciences, has passed, represent the reign of theory or rather of dogmatical assertion, while it has now entered upon its third stage, the observative and inductive, thereby combining the two elements necessary for its success.*

* M. Roban describes three stages, the Theological, Metaphysical, and Positive.—Du Microscope, Deuxieme Partie; Page 18. Paris, 1849. See also, Cours de Philosophie Positive, par M. Comte.

The claims of theory having been thus brought before your notice, we shall next proceed to define what is the object of the researches conducted under the name of Pathological Anatomy, which Förster defines, as, "the science of the exact form of diseased change considered from a general point of view; while special Pathological Anatomy is the study, of the phenomena in regular succession as laid down in the special organ or tissue, and Physiological Pathology is the search after the order in which these changes occur, and the cause which produces a certain effect." But ther must be some limit to this kind of investigation; defining it to be the science of the physical deformities of the solids and fluids that compose the body, expresses that the legitimate object of Pathological Anatomy is the study of the alterations of *form*, and when we go beyond this limit we pass into the region belonging more properly to chemistry. Still it must be observed, that certain substances are alike subject to the investigations of the chemist and the pathologist; to this class belong Fibrin, Albumen, Casein, &c.; these require to be examined from many points of view, and every day is rendering more frequent these most profitable reunions of the sciences. One of the reproaches cast on the practice of our profession is, that it is empirical and not entitled to be considered as a science, because it does not explain by what means, what we presume to be causes, produce what we state to be effects; this, in a measure, merited reproach, is removed by making Pathological Anatomy a part of Medical education; it supplies the deficiencies in medical reasonings; it deals with facts which can be demonstrated, and thus forms a basis for logical deductions. It may, however, be suggested, that there is no necessity for a special course on this subject, as it is taught in the Lectures on Practice of Medicine and Surgery, and in the Hospitals. To meet this objection I will bring forward the axiom, that the most profitable course of reading, and the only one by which a thorough acquaintance with disease can be obtained, is by the study of monographs; this once admitted, it is unnecessary to occupy your time by entering into particulars to prove, that a course of lectures, with demonstrations, on any special subject, is equivalent to a monograph; and further, if it be on a department of medical science requiring manipulation, it supplies that which cannot be learned from books. No one wishing to become acquainted with Aural or Opthalmic Surgery, would rest satisfied with the necessarily short remarks made on those diseases in a course on the practice of Surgery, and Irish Medicine owes a debt of gratitude to Mr. Wilde for having opened a course of special instruction on these subjects. Would the student desirous of an intimate knowledge of diseases of the chest, content himself with reading the more or less abridged account of these affections to be found in the class books on the Practice of Medicine, and are we not justly proud, that from the Irish school has emanated the best monograph on these diseases that has appeared since the time of Laennec. If then it be true that we must study disease separately as well as collectively, how much more forcibly does it apply to that branch of science which includes within its embrace the lesions produced by the entire category of diseases. How unnecessary would be these remarks in England, Scotland, France, or Germany; they would be considered as belonging to an age long since gone by—arguments

whose force has been admitted, and suggestions that have been for years put in practice. Every college and school aiming at celebrity has attached thereto a Chair of Pathological Anatomy, ably filled, well attended, and productive of the greatest benefit to science. Every department of Medicine has its professor in our University and in the Queen's Colleges, save that to which I venture thus to draw your attention; and have we not every reason to believe, that the founding of a Chair on this subject would tend to impart a more decidedly scientific tone to these institutions, and place them in a more favourable position to compete with similar establishments in the sister country.

Having endeavoured so far to prove the necessity for such knowledge, let us now inquire how it is to be obtained. Among the works of those who have devoted special attention to this subject, and should be carefully studied, are Vogel's Pathological Anatomy translated into English by Day, Otto's Human and Comparative Anatomy by South, and Lebert's Physiologie Pathologique. On the Pathology and Microscopic appearances of Tubercle, the works of Louis (*a*), and Lebert (*b*), may be consulted with advantage. The literature of Cancerous affections is to be found in the monographs of Walshe (*c*), Bennett (*d*), and Lebert (*e*). Renal pathology has been fully treated of by Bright (*f*), Christison(*g*),

a. Recherches Anatom. pathol. et thérap. sur la Phthisie. Paris, 1843.
b. Traite Prat. des Maladies Scrofuleuses et Tuberculeuses. Paris, 1839.
c. On Cancer. London, 1846.
d. On Cancerous and Cancroid Growths. Edinburgh.
e. Traité Pratique des Maladies Cancereuses. Paris, 1851.
f. Report of Medical Cases. London, 1827.
g. Treatise on Granular Disease of the Kidney, Edin, 1838.

Rayer(*a*), Prout(*b*), Johnson(*c*), Bird(*d*), Gairdner(*e*), and Rees.(*f*) Hepatic disease has been investigated by Annesley (*g*), Thompson (*h*), and Budd (*i*) ; M. Piorry(*j*) has brought to light many facts regarding the spleen, but the pathology of this and the other blood glands has not been made the subject of any special treatise; however, the works of Simon(*k*), Kölliker(*l*), Sanders(*m*), and Jones(*n*), have made us acquainted with their minute structure, and Dr. Bennett's recent and highly valuable observations on Leucocythema, or white cell-blood, has opened a new field for pathological research. The Pathological Anatomy of the nervous system is comprised in the works of Abercrombie(*o*,) Lallemard(*p*), Grainger(*q*), Marshall Hall(*r*), Hannover(*s*). Pinel(*t*), Solly(*u*), Bennett(*v*), and Todd(*w*). The heart, arteries, and veins form the subject of the

a. Traité des Maladies des Reins. Paris, 1839.
b. On Stomach and Urinary Diseases. London, 1841.
c. Medico-Chirurg. Review, page 193. 1836.
d. On Urinary Deposits. 3rd Edit. London, 1851.
e. Gairdner on the Pathology of the Kidney. Edin. 1848.
f. On the Nature and Treatment of Disease of the Kidney, connected with Albuminous Urine. London, 1851.
g. Researches on the Diseases of India. 2nd Edition.
h On Diseases of the Liver.
i. On Diseases of the Liver.
j. Traité de Médecine Practique, Vol. 6. Paris, 1845.
k. Physiological Essay on the Thymus Gland. 1845.
l. Art. Spleen, Cyclop. Anat. and Phys.
m. On the Structure of the Spleen. 1851.
n. Arts. Thymus and Thyroid Gland, Cyclop. Anat and Phys.
o. Pathol. & Pract. Researches on the Brain & Spinal Cord. Edin. 1845.
p. Recherches Anat. Path. sur l'Encéphale. Paris, 1836.
q. On the Spinal Cord. 1837.
r. Diseases and Derangements of the Nervous System. London, 1841; and Treatment of Apoplexy and Paralysis. London, 1851.
s. Microscopic Researches on the Nervous System. Copenhagen, 1844.
t. Traité de Pathologie Cérébrale. Paris, 1844.
u. The Human Brain, its Structure, Physiology and Diseases. Lon. 1847.
v. Edin. Med. and Surg. Journal, Vols. 1842—43.
w. Medical Gazette, 1849 and 1850.

researches of Breschet(*a*), Hope(*b*), Pucheit(*c*), Dubrueil(*d*), and Crisp(*e*) ; the blood and other fluids have been examined by many, the most remarkable being Gulliver(*f*), Andral and Gavarret(*g*), Rees(*h*), Griffith(*i*), Paget(*k*), Jones(*l*), Sanderson(*m*), and Bennett(*n*) ; while Hasse(*o*) has added to our knowledge of pulmonary lesions.

But Pathological Anatomy cannot be learned from books alone, practical knowledge is still more necessary, and cannot be attained without the examination of diseased parts; to become Pathologists requires the exercise of our senses and the use of the mechanical aids, by which the field over which these senses can act is enlarged, and as we are dealing with a science of form the senses of feeling and seeing are most directly called into action, especially the latter. How much can be done by the unaided eye, the works of Morgagni, Hunter, Rokitansky and Cruveilhier sufficiently prove, and if the power of this organ was increased, ought not the results obtained thereby be in a similar proportion ;

a. Mém. Chir. sur les différentes espéces d'Anévrysmes. Paris, 1834.
b. On Diseases of the Heart. 1839.
c. Das Venensystem. Leipzig, 1843.
d. Des Anomalies Artérielles. Paris, 1847.
e. Diseases of the Blood Vessels. London, 1847.
f. Lond. and Edin. Phil. Mag., Vol. 16. 1840.
g. Rech. sur les modifications de proportion du Sang dans les Maladies. Paris, 1842.
h. On the Analysis of Blood and Urine in Health and Disease. 1845.
i. Chemical and Microscopic Characters of the Blood. 1846.
k. Kirke's Handbook of Physiology ; 2nd edit. page 46 ; Med. Gaz. 1849.
l. On the State of the Blood and Blood-vessels in Inflammation. Guy's Hospital Reports, Vol. vii., page 1.
m. On the Metamorphosis of Coloured Blood Corpuscles. Monthly Journ. Med. Science, Sept. 1851.
n. On Leucocythemia, or White Cell Blood. Edin. 1852.
o. Anatom. Descrip. of the Diseases of the Organs of Circulation and Respiration. Transl. for the Sydenham Soc. by Dr. Swaine. Lond. 1846.

could our vision penetrate into the interior of this earth, the state of matter in its centre would be a demonstration and not a deduction; but man's ingenuity would not have been called so forcibly into action had our senses been more exalted; thus, the Creator has conferred on man the most unalloyed class of enjoyments, namely that derived from the exercise of his mental faculties, by setting narrow and well defined limits to our senses, while He implanted within us the wish to improve—man used his senses and found them too weak to satisfy his longings after the Unknown—he invented instruments—then the word World found its plural and Astronomy was ranked among the sciences—time rolled on and Leeuwenhoek began the sublime demonstration, that his Creator is as great in littleness, as he is great in greatness, as infinite in the formation of a cilia and giving to it the laws that regulate its vibrations, as when he called worlds into being and gave their course to the satellites; are we not then highly culpable if we neglect using the means put within our reach, and shall we refuse to become acquainted with any instrument that has conferred benefits on mankind. The zeal and success with which Irishmen have studied the Stethoscope as used by Laennec, forms a striking contrast with their neglect and ignorance of the Microscope, Zansz's instrument; and it has been pleaded as excuse for our apathy, that except in renal affections the Microscope has not been useful in the study of disease in the living, and therefore it is not worth the attention of the practical physician whose object is to treat the sick, and cannot devote his time to mere scientific pursuits, under which head microscopic investigations are classed. Let me ask, "in what class of disease,

except those of the lungs and circulatory apparatus, has the Stethoscope been useful?" Are we then to neglect the use of an instrument because it is only applicable to the diagnosis of the diseases of one organ; here we have to deal with an assertion, which while admitting its usefulness, declares it unworthy of the attention of those whose efforts are directed to cure or relieve, and while its application to the study of renal diseases has been as yet its greatest practical triumph, those who keep pace with the progress of science cannot but feel, that it is daily extending its sphere of usefulness, daily aiding us more and more in diagnosis, and thus enabling us to treat successfully.

In order to shew the practical value of microscopic investigations, allow me to lay before you a few facts, of such a character as will, I trust, bring conviction to the minds of all who are desirous of seriously considering its claim to the attention of those, whose high mission is to relieve the ills of suffering humanity.

Affections of the scalp are perhaps the most difficult class of skin diseases to diagnose or treat successfully, and charlatans have derived no small amount of profit from the number of infallible remedies reported to cure the Porrigo favosa and lupinosa of Willan (scald head, as it is commonly termed), which has long been one of the affections that has resisted the best medical treatment. Bassi discovered that the disease called Muscardine in silk-worms, was caused by the growth of a very low form of parasitic plant. Hannover observed a species of Leoptomitus on the mucous membrane of the mouth and tongue of two patients suffering from typhoid fever; also on the apthæ of infants, on the mucous membrane of the œsophagus, and even in the bladder. Schönlein of Berlin, was the first to assert the vegetable origin of Porrigo, which has been confirmed by Fuchs, Remak, and Roban, while Gruby, Lebert and Bennett have made on it further investigations, rendered most valuable by the engravings of the microscopic appearances, and in 1845, the latter succeeded in inoculating the disease in the human subject, thus removing all doubt of its vegetable origin; the microscope has, in this instance, enabled us to form correct pathological ideas of the disease, and thus to arrive at its successful treatment.* The presence of albumen in the animal fluids and secretions has been found to play a most important part in modifying our opinions of the causation of many diseases, and forms a leading therapeutical indication; the name of Dr. Bright will be handed down to posterity connected with this highly valuable discovery in renal pathology, and he has pointed out the value of this symptom, in its relation to effusion into the serous cavities, especially of the arachnoid. The following means of research, then, though not microscopic, may be here alluded to as belonging to the same class of inquiries. M. Becquerel having experimented on 150 specimens of serum from the blood, and on 50 pathological fluids, has arrived at the following conclusions:—1st, That the albumen held in solution by serum and other organic fluids, causes the plane of polarization of a transmitted ray to deviate to the left. 2ndly, That the degree of deviation is proportionate to the amount of albumen contained in the liquid, and that by means of the angle its quantity may be directly calculated. 3dly, That the "mo-

* For further particulars, see Sobernheim's Elemente der allgemeinen Physiologie, page 88. 1844.

lecular rotative power" for albumen is about 27° 36′, and that in examining a fluid each minute of rotation may be held equivalent to 0.18 parts of albumen per thousand. The possible error of observation does not exceed four or five minutes, and hence, cannot affect the calculated result by more than one decimal part per thousand—a degree of accuracy which cannot be obtained by any other mode of examining albuminous fluids. But to return to strictly microscopic investigations, I may refer to a case mentioned to me by Dr. Bennett, and since published.* A gentleman consulted an eminent surgeon in London for a difficulty he experienced in swallowing, and on examination, a swelling was discovered deep in the pharynx, which after consultation was considered to be an abscess, and was about to be opened; however, while passing his finger far back into the pharynx to ascertain its exact position, the surgeon found on withdrawing his hand that something of a thicker consistence than mucus adhered to his nail, having been evidently scratched off the sides of the swelling in making the necessary manipulations; he immediately went to Mr. Quecket, of London, who after careful microscopic examination, declared it to have been taken from a surface undergoing cancerous transformation. The surgeon wisely refused to operate on the supposed abscess, and after death a cancerous tumour was found in the place occupied by the swelling. The practical value of such a discovery needs no comment.

Dr. Bennett and Mr. Cooper have drawn attention to the method of ascertaining the nature of a tumour by

*For this and similar cases see Lectures on Clin. Med., part 5, Edin. 1851.

passing into it an exploring needle and examining what adheres thereto, as has been proposed by Küss of Strasbourg, and alluded to by Dr. Lyons;* but it appears to me, that the value of such a mode of investigation is by no means confined to the advantages to be derived from a knowledge relative to the tumour itself; medicine as well as surgery may be advanced by our obtaining an accurate idea of the nature of a tumour; for example, one of the most difficult diagnosis of thoracic disease is that of cancer of the lung, and Dr. Stokes has long since pointed out the existence of cancerous tumours on any part of the body as aiding us most materially in arriving at its diagnosis. But how are we to ascertain whether a tumour occurring in such a case is fatty, fibrous, scrofulous, melanotic or cancerous? simply by the procedure above described, which changes conjecture into certainty. Dr. Simpson has brought the exploring needle before the Obstetrical Society of Edinburgh as a means of diagnosis in some doubtful cases of pelvic abscess,ovarian and other tumours existing about the cervix uteri, the cystic or other nature of which it was otherwise impossible to determine.† Even after a tumour has been removed, its microscopic examinations should never be neglected, as there is still a solution required to the following proposition—what are the probable chances that a cancerous growth removed from the body will appear after a certain time in some other part? This question might be asked of all kinds of tumours, and we could state what were the

* Apology for the Microscope, page 34.
† Monthly Journal of Medical Science, vol. x., page 196. 1850.

chances of permanent cure after their removal, on principles more fixed than the *ipse dixit* of a surgeon, if those connected with Hospitals followed the example of Mr. Cooper,* who, in his valuable Paper on "The application of chemical analysis and microscopic examination of morbid products to the formation of a correct diagnosis," has brought forward many highly instructive cases—one in which he drew off twelve ounces of limpid fluid from an enlargement situated on the right gluteal region; chemical analysis shewed that the liquid contained chloride of sodium and a small quantity of phosphate of lime, in proportions so exactly coinciding with those of the fluid of the spinal cord, that he was at first led to suspect some communication between the tumour and the vertebral column; but the microscope took up the examination where chemical investigation had failed, and numerous echinococci found in the fluid, proved the tumour to be dependant on the developement of hydatids. In another case the presence of biliary matter, and the remains of some half digested muscular fibres, both found on microscopic examination, proved that the abscess from which the fluid was taken communicated with the bowel, which was afterwards rendered certain by the passage of the contents of the intestine through the opening; many other examples of the value of microscopic investigations in the diagnosis of disease are recorded in this article. Mr. Paget† has established the connection between apoplexy and fatty degeneration of the small vessels of the brain, and Dr. Addison drew the attention of his clinical class, last winter, to the fact

* Guy's Hospital Reports, vol. vii., p. 105. † Med. Gaz. 1850, p. 229.

discovered by Dr. Gull, that the fluid in cases of abdominal dropsy, is often full of oil globules; its connection with the disease of some organ cannot be doubted, but its relation to diagnosis remains yet to be proved. Lastly, Van der Kolk* has observed, in the expectoration of phthisical patients, the elastic fibres which surround the cells of the lungs; under a power of two hundred diameters they appear arched, very thin, with sharp borders, at times covered with fat, which ether removes, and he cautions us against confounding them with a species of conferva which forms rapidly in the expectoration, especially when it contains fat; but the ramifications of the conferva, terminating in tumified cells, distinguishes them from the elastic fibres, and these last are seen most certainly when the tubercles begin to soften; this sign, therefore, is the more valuable, as it is best marked when most required, namely, at an early period of the disease. I cannot leave this part of the subject without drawing your attention to a Paper by Dr. Taylor, in the November number of Guy's Hospital Reports for 1851, entitled, "Remarks on death from strangulation," in which you will find a detailed account of the application of the microscope to the discovering whether stains found on the clothes of a prisoner were caused by blood or dye-stuffs, and whether it was human blood or that of animals. To conclude, Dr. Redfern, in his "Researches on Articular Cartilages," has brought forward many facts to prove, that the pain which has been stated by the highest authorities to be indicative of disease of the articular cartilages, is to be

* Medico-Chirurgical Review, vol vii., p. 257. 1851.

attributed to some of the surrounding tissues being engaged, for he has been unable to find nerves in cartilage; and Kölliker, without being aware of Dr. Redfern's experiments, has made a similar observation in his recently published Microscopic Anatomy. Here we have one of the many instances in which the microscope has been used to test assertions, which have too often, up to the present time, derived the reliance placed in them from the name of the individual by whom they were made. Having endeavoured to put prominently forward a few among the numerous cases where the microscope has been practically useful, it would now be my place to describe the instrument, but I refrain from so doing as its history can be found in any of the class-books, and its description forms part of the immediate subject of the Course, during which numerous opportunities of learning its manipulations will occur.

It must be apparent to every one, that before commencing the investigation of diseased structures, we should be acquainted with the minute normal anatomy of the solids and fluids that compose the body; for as disease consists in a variation from health, we cannot become cognizant of the existance of the former without being first aware of the state of the organs in the healthy condition; we therefore propose to devote part of this course to the demonstration of the structure of blood, secretions and solid parts, making thereon such remarks as will enable us better to understand the physiology of diseases; for in pathology no new law appears to exist, hence, diseased action may be considered as an increase or diminution of a normal process, or its occurrence out of its proper place, for a change which is normal in one organ would be abnormal in another;

we must then at times necessarily encroach on the territory of Physiology, for as has been ably put forward in a late review, "every experiment made by the Physiologist is really the induction of an abnormal or pathological condition, from which, as also from the phenomena of disease, he is enabled to deduce inferences which the most persevering observation of normal action would never have revealed to him; in the observation of disease we cannot ascertain what really are its phenomena unless we are acquainted with the normal actions of which they are perversions; nor can we make the least approach to any more than an empirical association of these phenomena, unless we are acquainted with the mode in which the healthy action of the organs which manifested them, are linked together."

We have thus seen that to make ourselves familiar with Pathological Anatomy, we must study long and observe accurately, but in order to make our observations understood by and useful to others, something more is required, and here an illustration will best explain my meaning. A student, examining an epithelium cell, wishes to describe what he has seen; he begins, "it is like a small bladder;" thus he is unconsciously theorising before he has stated the grounds on which his comparison is made; he continues, "it is like a small bladder, with something like dust in its interior;" theorising again—and how many different objects could be drawn, exhibiting bladders in every stage from complete collapse to full inflation, containing from one to a thousand particles of dust, all answering to the above description, and yet not one like the object observed? To give an accurate and distinct idea of any thing, our description must be such as would allow an

exact image of the object to be drawn, as we relate its appearances; this can only be accomplished by having certain rules to guide us; these will, I trust, be clearly explained in the course, for a want of methodical description has too often rendered useless what would otherwise have been highly valuable—and if the study of Pathological Anatomy did nothing more than bring our observative faculties into exercise and teach us how to use them to the best advantage, it would form no mean element in disciplining the mind for the study of that profession, which requires for its successful practice acute observative powers, and a directly logical turn of mind—therefore, Fellow-students, this undertaking is a serious one, begun with diffidence, but in hope; on you depends the realization of that hope, and is it not a high and honourable one, and will you not lend me your earnest co-operation in this attempt to raise the character of the Irish School of Medicine, at the same time that you will be preparing yourselves for the honourable and scientific duties of your profession. Seniors in that profession, I would ask your assistance, such assistance as the experienced can give those who are entering on the rough road of investigation which leads to that true Mountain of Light, where Truth stands revealed by science. As fellow-labourers I ask your assistance—as friends your advice—well I know much is in your power, fully sensible am I of the value of your aid, and short indeed should be my memory did I forget that you were my instructors—help me then to teach others what has been taught to me.

SYLLABUS

OF A COURSE OF LECTURES ON

PATHOLOGICAL ANATOMY,

WITH MICROSCOPIC DEMONSTRATIONS,

TO BE DELIVERED AT THE ROYAL CORK INSTITUTION,

BY THOMAS S. HOLLAND, M.D., M.R.C.S.L.,

Corresponding Member of the Société Anatomique,

AND OF

The Parisian Medical Society.

The Course, extending over the months of February, March and April, will commence on Monday, the 9th Inst.

PART 1st.

Object of the Science—to trace the connection between the Cause, the Lesion, and the Symptom.

Necessity for Classification:—Laennec's, Andral's, Cruveilhier's, Rokitansky's, Vogel's, &c.

I.—*Lesions of purely Physical Origin.*

1st....Produced before death in obedience to Physical and Chemical Laws.

2nd...Resulting from Cadaveric Changes.

II.—*Abnormal Accumulations.*

1st....Of Gases.

2nd...Of Fluids.

3rd...Of Substances existing in the state of health, as Fat, &c.

III.—*Changes in the Physical and Chemical qualities of the Blood, considered in their relation—*

1st....To the Entire Body, as in Hypercœmia and Ancœmia.

2nd...To particular Organs, as in Hypertrophy and Atrophy.

3rd...To itself, as an Organized Fluid.

IV.—*Formation of Substances not existing in the healthy state.*

1st....Inorganic Pathological Formations, as Calculi, &c.

2nd...Organic Pathological Formations.

First...In the fluid, or semifluid state, as Pus, and the various Exudations.

Second...In the solid form, as Tubercle, Cancer, &c.

V.—*Organic Bodies developed in or on the Human Body, but more or less independent of it for their vitality, as Hydatids, Fungi, &c.*

VI.—*Death of part or of the entire Organism.*

PART 2nd.

Introductory Observations.

Theory of the Simple Lens.

Spherical and Chromatic Aberration.

Achromatic Lens.

Description of the Optical and Mechanical parts of Simple and Compound Microscopes.

Accessory Instruments and Chemical Re-agents.

Choice of a Microscope.

Disadvantages attending the use of high magnifying powers.

How obviated,—Use of the Achromatic Condenser.

Size of Microscopic objects,—How estimated.

French and English Micrometers.

Method of correctly describing objects.

Etching and the use of the Camera Lucida.

Study of objects that are liable to cause errors.

Normal Microscopic Anatomy.

Examination of Elementary Vegetable Structures as introductory to the study of Animal Tissues.

Microscopic Elements of the Animal Fluids and Solids.

Examination of Blood in Man and the Lower Animals.

Use of Injections in demonstrating the Vascular System.

Examination of the Normal Secretions and Excretions.

Examination of the most simple Tissues.

Ascherson's and Melsen's Experiments repeated.

Structure of Mucous and Serous Membranes.

Structure of the Cartilaginous, Vascular, Muscular, Nervous, Ossific and Dermal Systems.

Structure of the Glandular System, including the Lungs, Liver, Kidneys, Pancreas, Spleen and the other Blood-Glands.

Pathological Microscopic Anatomy.

Examination of the Pathological changes that occur in the Vessels and their contents, resulting from Inflammation or Abnormal Nutrition, &c.

Pathological changes in the Animal Fluids, as in Urine, &c.

Pathological changes in particular Organs, as in Bright's Disease, &c.

Pathological changes that occur in the Solid Form, as Calcareous, Fatty, Fibrous, Cartilaginous, Tubercular, and Cancerous formations in the various Organs.

Examination of the Forms of Animal and Vegetable Life found in or on the Human Body.

Examination of the changes occurring in Hypertrophy, Atrophy, and Decomposition.

Part I. will consist of Lectures, delivered twice a week.

Part II. will constitute the Microscopic Demonstrations, given on two intermediate days.

From Dr. H.'s extensive opportunities for making Post Mortem Examinations, he hopes to be enabled to lay before the Class, recent specimens of most of the diseased changes that occur in the human body.

15, George's Street, Cork,
Feb. 1851.

H. Ridings, Printer, 19, Cook-street, Cork.

THE IRISH SCHOOL OF MEDICINE

AS IT IS AND AS IT OUGHT TO BE.

AN ADDRESS

INTRODUCTORY TO A COURSE ON

PATHOLOGICAL ANATOMY & HISTOLOGY

IN RELATION TO THE

PRACTICE OF MEDICINE AND SURGERY,

DELIVERED

AT THE ROYAL CORK INSTITUTION,

BY

THOMAS S. HOLLAND, M.D.

CORK:
GEORGE PURCELL & CO., 20, PATRICK STREET.
LONDON: SAMUEL HIGHLEY, JUN., 32, FLEET STREET.
1853.

TO

HIS FELLOW-LABOURERS,

THIS PLAN OF THE

NEW IRISH SCHOOL,

IS DEDICATED BY

THE AUTHOR.

ADDRESS.

At the opening of a second course on Pathological Anatomy and Histology considered in relation to Medical Science, it may be expected, that the diffidence which necessarily accompanies a first lecture, would be succeeded by a degree of confidence, arising from the ordeal of the course, to which it was introductory, having been passed, at least not unsuccessfully.

A Lecturer is entitled to whatever degree of modest confidence the conscientious discharge of his duties may bring with it, and such would probably be my feeling, did I come before you, Gentlemen, to introduce a repetition of the last course* to your notice, or had I not derived great benefit from it; as he, who while instructing others, has not been taught how much he has yet to learn, may be the only one whom the course has failed to improve.

Having, in my last lecture, sketched an outline of the history of Pathological Anatomy, I shall, on the present occasion, direct your attention to matters of more local interest, which will I hope engage your attention during this short hour, while its development will be, or at least ought to be, one of the highest ambitions of your future life, namely, the necessity, possibility and means whereby Medicine, as an inductive science, may be advanced, a New Irish Medical School founded, and this city thus made to form a chapter in its history.

* For Syllabus, see page 21.

The commercial prosperity of a country is for a time materially aided by a centralization of wealth, but there is also a period when it becomes directly disadvantageous; Liverpools, Birminghams, and Belfasts are essential to permanent prosperity, an argument equally applicable to science; and as the Irish School, formed in Dublin, has hitherto claimed that city as its representative, a reputation so limited cannot outlive many generations, or the drain on provincial intellect that is required to sustain its character, must become most injurious to the country generally.

That the period has arrived, when scientific centralization should cease, is proved by the establishment of scientific instruction in the provinces: further, that the Intelligence of the country feels we are entering on a provincial era, is clear from the success of the new institutions; and this lecture cannot find a better, a higher, or more appropriate subject, than the consideration as to, how a medical school, destined to raise the character of Irish medicine by imparting to it a rational, inductive and truly scientific spirit, such as constitutes the leading feature in modern physic, can be formed in this city.

The greater the amount of individual interest that can be brought to bear upon any undertaking, the more rapid will be its success, while if each of us was sensible of the part he can take in the formation of a great provincial school, it would impart to us that essential, though too often deficient element in our character—self reliance.

Most schools have been formed by two or three well-disciplined and determined minds, combining to effect this object, who, having laid aside all personal and petty jealousies, determined *what should be done*, and *did it*, under difficulties against which *we* have not to contend—for in this city there are all the essentials for the formation of a great school—a College, Two General Hospitals, a Fever, a Lying-in Hospital, a Union, a Dispensary—which, if properly used would be productive of the best results to science; yet how almost unknown in the medical world has Cork hitherto been?

Although it cannot be expected, that each of these institutions will advance medicine in the same degree, as their opportunities are not equal, yet all can add their quota to the formation of a medical school;

to which, since this is not to be accomplished by those alone who are directly connected with the instruction of students, all can give their assistance, as every original observation, it matters not by whom made, helps to direct attention, not only to the individual, but also to the city in which it has been made.

Further, it is our duty, while engaged in the formation of a medical school, to prove our appreciation of merit, and our respect for those who diligently devote themselves to scientific pursuits, by invariably supporting the best qualified in all elections for public offices. It is most disheartening to any one who has seriously and laboriously devoted himself to scientific or other pursuits, to see how lightly merit is appreciated, to discover that long hours of study, and even past services, are weak recommendations when compared with the influence of the too often ignorant friends, that are ready to support those, who make sectarianism not christianity, politics not patriotism, fiction not truth, the means of obtaining place.

It is the pursuit of this line of conduct, and the silent encouragement it finds, that have obliged many to seek, what they have again and again found, honor and an honorable livelihood in other cities.

The records of the University of Dublin bear testimony to the superior abilities of those born among us—one of our fellow-townsmen* took the highest place at the examinations for the degree of Doctor of Medicine in the Queen's University—above the tumult and uproar of London, are heard the names of men, who once called this city their home; but it were far better were it in our streets, and at our scientific meetings they were to be seen—how much more pleasing, to hear their praise from their fellow-citizens, than to have it *sent* to us as the opinion of others—far more creditable would it be to have it said, " I knew him when a child," than to read, "Who is he?" an inquiry, ever made, when a stranger raises himself above the mass.

Shame upon us Irishmen, that we know not how to value the merits of our own—little hope is there for a school, or a country, in which the greatest praise is bestowed on strangers.

* Dr. Donegan.

Gentlemen, if we wish to live long, we must cease cutting one another's throats—a thing which can be done without a razor.

It is evidently to the interest of every one, to make a scientific character for this city, as well as for himself; and as our commercial prosperity must be increased by the influx of students, and by the better education of the next generation, those who desire to see their children attain a high position, should themselves begin a work, from which others may derive benefit and fame.

The Dublin School of Medicine owes the celebrity it has obtained, to the pre-eminently successful manner in which it has carried out the system of clinical instruction derived from the Germans; but, unfortunately, the cotemporaries of the founders of the Irish School, did not also imitate, or acquire, the highly scientific and truth-searching character of the German mind; had they done so, they would never have allowed the reputation of the school to be limited to, or dependant upon, the cultivation of any one branch of medical science. Though our teachers have most accurately and successfully studied the diagnosis of the diseases of the thoracic viscera, their treatment and that of fever, yet it must be evident, to all who are acquainted with Irish Medical Literature, that the affection of the abdominal viscera and nervous system, have not been as carefully observed, as in other schools.

The high character of Irish medicine was for some time so evident that it became almost proverbial, and formed the subject of all introductory lectures, the boast of the Senior to the Junior Student, but no one has hitherto ventured publicly to inquire, whether Structural Anatomy, Physiology, Pathological Anatomy, or Organic Chemistry, existed as a part of our system of medical instruction.

Further, the belief in the immortal fame of the Irish School, became so implicit and universal, that students, many of whom are now Doctors, acted on the principle, that by learning what their teachers had discovered, and reading the three or four Irish medical classics, the culminating point of medical knowledge was attainable.

I cannot, on this occasion, forbear publicly expressing an opinion which I have repeatedly stated in private—that the Irish School of

Medicine has indeed reached its culminating point, and must of necessity decline, if we continue basking in the sunlight of our teachers' names. How I revere these teachers, is known to those best acquainted with me, and how I endeavour to follow their high examples, is felt within myself, though I cannot resist the conviction, that this will not be accomplished, by merely traversing the roads they have already cleared. Irish medicine must assume a new character; a truly scientific spirit must be re-instilled into our school, if we desire that it shall keep pace with the advance of science.

Medicine and Surgery are no longer to be learned, by the bed-side exclusively; the products of disease should not be hastily cut into, and then cast away; the excretions are now examined, not for form sake, but with the intent of deriving information from them, such as can be obtained in no other way; with a microscope, and chemical re-agents, the physician, while in his study, frequently learns more of the true nature of the case, than he had done in the sick-room.

The *ipse-dixit* of a teacher, the repeated use of that libelled word Experience, is no longer sufficient to induce the student to receive as truth, assertions that have been repeatedly called in question—the *post hoc, ergo propter hoc* argument, is fast falling into disuse, even in discussions on the effect of remedies; and the student of modern medicine feels, that the right to doubt, being one of man's most sacred privileges, should on no account be withheld from him; and nothing ought to induce him to receive as truth, what demonstration, or the closest reasonings, have failed, or are insufficient, to confirm.

The student of Surgery learns Descriptive Anatomy, with the avowed intention of applying it to the practice of that department of the profession. Professors of Surgery never omit an opportunity of making their anatomical knowledge illustrate and justify their diagnosis and treatment: an intimate acquaintance with Physiology and Organic Chemistry, is considered essential to the student of Medicine, and how carefully these subjects are studied, is known to all who are preparing for, or have passed, their final examination for the degree. To what use have so many hours been occupied in such studies, if, after having entered upon the practice of the profession, they are to be forgotten, or at least never continued? Can professors admit these sciences into the curricula of medical education, if they neither apply their principles to practice, nor justify that practice by reference to the laws of physiology and organic chemistry; and finally, how can they expect students to take an interest in subjects, the applicability of which to diagnosis and practice is not pointed out by the professors of clinical medicine—for, it is well known, their connection is affirmed once a year at each introductory lecture, and as regularly forgotten, even by the professor, until the opening of next session *suddenly* reminds him of the all-importance of their study.

Except as a subject of abstract scientific inquiry, it is to no purpose we learn the functions of any organ, or the chemical and structural changes resulting from their performance; it matters little to the students of the healing art, if a salt is soluble or insoluble in urine, whether an organ produces certain changes, in but one of the elements of food, or acts upon all indiscriminately; such knowledge is, indeed, of but little importance, in a practical point of view, unless it be brought to the bed-side, and applied to the treatment of the sick. In our system of clinical teaching, this is the grand deficiency, and, unless remedied, Irish medicine has indeed reached its culminating point.

Passing from diagnosis to practice, how great a change the entire system of therapeutics is undergoing.

Could the origin of Homœopathy have been delayed until the twenty-first or twenty-second century; would Hahnemann have then put forward his doctrines; or is it probable, that they would be received by any one who graduated in medicine in the year two thousand? To these inquiries, a negative response may, almost with certainty, be given, as physicians will then most probably write, what may be called, chemico-physiological and pathological prescriptions, the composition of which will be suggested, by an accurate knowledge of the pathological states under treatment, and the physiological and chemical actions of the remedies, used for their removal.

Then, empyricism will be ranked with alchemy; medical logic will have obtained the high place it merits, and no system based upon ignorance will outlive a discussion. In two hundred years, the

student of the science of medicine, inquiring of his teachers, why homœopathy found supporters among the physicians of the nineteenth century, will be answered—because the allopathists, as they were then called, could not explain the actions of the remedies they used—such errors in therapeutics are the result of our imperfect knowledge, to remedy which, is one of the efforts of the New School.

To what are we to look, if not to pathological anatomy, organic chemistry, and physiology, for an abolition of the empyrical and the adoption of a rational system of therapeutics. True, our Materia Medica will be probably reduced to a small compass; but one truth, one fact, will be cheaply bought, with the destruction of a pile of herbs. Remove from medicine the aid of the sciences just mentioned, and it will become necessary to multiply editions of the Aphorisms of Hippocrates; bring the light of these sciences to bear upon it in their full force, and this century will become, that which it is, the epoch of the creation of medicine as a science.

Such is the tendency and object of the new school. By following this course, a few active minds have made the names of remote country-towns known throughout the scientific world, and raised long-forgotten universities to such a height, that they form dangerous rivals to wealthy, long celebrated, institutions.

The time, happily for us, is past, when the celebrity of a college was measured by the thickness of the ivy that clung to its walls. Young, determined, disciplined and well directed minds form, in the nineteenth century, its best support, and on them its developement and future fame depend.

The students of this country appear to be unconscious of the moral power they possess, a power which if called into action will be productive of most important results. Students alone can judge of the competency of their teachers; the long winter session forms, as it were, one vast arena for the display of the professor's abilities; his audience ought to be his judges here as they are elsewhere; and if after fair trial they consider him incompetent for the office he holds, may I take the liberty of inquiring, have they not a perfect right, (and this neither the senatus nor the public can refuse them) to memorialize the professor to improve the character of his instruction; and in the event of this request, when respectfully made, not being attended to, may not appeal be made to the proper authorities to replace the professor by one more competent to instruct. Still, it should be remembered, that in treating of a subject such as medicine, unavoidable deficiencies will at times occur, and imperfections be observable, in the most highly gifted, caused by circumstances over which we may have no control; these cannot, and do not, leave but a transitory impression on the mind of the well-educated student; for it is at all times easier to act the part of critic than of lecturer; and the students should never forget, that they are only entering on studies through which their teachers have already passed. It is the *character* of the instruction, that should be most carefully watched by the class, and in the event of the *subject matter* of the course not being such as the wants of the students, and the existing state of medical science require, then, an appeal, well founded and respectful, should meet with the best attention of the authorities, and if not, the public journals are ever open to the aggrieved. Indeed it appears as if the founders of the Queen's Colleges wished to express their belief in the legitimacy of such an appeal, by inquiring at the triennial visitations, whether "the students had any complaint to lay before the visitors."

Students have passed their school-days; upon them, as gentlemen, the frown of a professor ought to have no influence; though his juniors, they cannot be considered, nor should allow themselves to be treated, as his inferiors; and while the discipline of a college must of necessity be most strictly enforced, the deportment of individual professors to the students should be such, as to induce confidence and win respect; each ought to uphold the interest of the other, remembering, that an infringement on either side, must ultimately be detrimental to both. Without students there could evidently be no professors, while the former might exist independantly of the latter, as self-instruction, though unprofitable and laborious, is perfectly possible; and a professor's highest ambition ought to be, to render his pupils competent to instruct others.

Let me for a moment direct your attention to the position of the

students in Göttingen, a university the professors of which are known throughout Europe and America; Wagner as a physiologist, Wöhler as a chemist, Henle as an anatomist and pathologist, have each acquired a reputation scarcely inferior to that of any in Europe: yet, in a university so celebrated, and so largely attended, the centre too of Hanoverian science, should any one, who had been appointed to a chair, from carelessness, or incompetence, have failed to make his course highly instructive, he, before many weeks passed, would have to lecture to empty benches, or the class would leave the room *en masse*. There the students are in every sense worthy of the name; a more gentlemanlike, laborious, intelligent class of young men can be scarcely found; by none are their professors more highly respected, as their first class abilities have insured them such esteem as is in no way dependant on college rules for its origin or continuance: and, however indifferent a teacher may desire to be considered, or appear to be, to the opinion of his students, there is not one but is proud, and justly proud of their esteem, not one but shrinks from their disapprobation.

The students of this city can raise themselves to a position as independant, and honourable, as that of their colleagues in Göttingen; the only reason why they are treated differently from German students, is, that they do not, as a general rule, apply themselves to study with the same untiring zeal and self-reliance. All that is necessary for gaining the esteem of your teachers as well as of the public, is, by individual efforts to acquire true self-respect, such as can alone result, from the consciousness of work done, and duty performed to the very best of your abilities: all forced marches are generally followed, if not by defeat, at least by a state of inactivity fatal to the character of the student; and the reputation of a school depends upon the character of its students, as well as on that of the professors. Character cannot be acquired in a session; were it so easily formed, it would be scarcely worth possessing; the more laborious and long-continued the exertion, necessary for the attainment of any degree of excellence, the greater the credit in succeeding.

The students in this city, it may be said with truth, have inducements to study, that they will in vain look for elsewhere. It is evident that the value of a prize is to be estimated by the amount of study necessary for its obtainment, and it is this that renders one medical degree of more intrinsic value than another.

A college has well done its duty, when it has established rewards to stimulate to exertion, while the students have not performed theirs, until they have made the position gained by the obtainment of the prize, more valuable than the prize itself. Defeat, after a long-continued struggle, is more honourable than victory over the non-resisting: hence, in the public examinations for professorships, that were until very lately the pride and chief element in the success of the French School, it has never been considered a disgrace to be unsuccessful: on the contrary, defeat at the Concours has been often the means of obtaining most honourable mention of men, who under other circumstances would perhaps never have been heard of.

Let all students then prepare for a hard struggle for prize and place; nothing can be more honorable to themselves, or more creditable to the school to which they are attached.

To the senior students, a still higher inducement presents itself; they can, not only lay the foundation of future distinction in their profession, but also directly aid in the formation of a provincial school of physic. There are certain departments in our profession that can be investigated but by those alone to whom circumstances have afforded opportunities of research. That these are not made good use of, should not discourage others from using the materials that are easily accessible; on the contrary, it should act as an encouragement; for it is evident, that a reputation can be comparatively gained with ease by the few who exert themselves, if the majority neglect to observe; while the intrinsic merit of work is so great, that "all honor to labor" is used even by the careless.

It is but necessary to make the experiment in order to feel how great the relief is, how pleasing the change, when we pass from the study of general principles and the opinions of others, to undertake or continue an original investigation; and there is one class of subjects, the immense importance of which to Practical Medicine and Surgery, is in this country only beginning to be

appreciated, the study of which can in a great measure be pursued at home, as the materials are more or less accessible to all, while its pursuit is calculated, not only to advance medical science, but tends to develope, to their fullest extent, the observative powers of those, who apply themselves to such investigations—to this class belongs the subject of the course that I am about to introduce to your notice.

Is it not a curious anomaly, a strange inconsistency, to find universities, as corporate bodies, and professors as individuals, insisting on the necessity of pathological knowledge, evidently the very basis of all medicine, without which disease can never be recognised, nor diagnosis confirmed? for were it impossible to make a *post mortem* examination, the cause of death should remain at best but a conjecture; this is proved by the autopsy being considered absolutely necessary as a part of the legal inquiry into all cases of death, occurring under suspicious circumstances; the Army Board insists on the examination of the dead bodies of all soldiers; yet neither it, nor the government, have as yet made it obligatory to study pathological anatomy; and I most advisedly affirm, that during the six years I studied medicine in Ireland, I *never* saw, either at an inquest or in an hospital, an autopsy made as it should have been, or as such examinations are conducted in other schools.

This, and many other statements which I have made during this lecture, may, and I hope will be considered as plain speaking, for this is the light in which it is my intention they should be regarded, as I believe we have too long endeavoured to conceal our deficiencies even from ourselves; and I cannot see a reason for continuing the mystification that only increases the difficulties in the way of our improvement, or admit that it is obligatory on any one to appear acquainted with what he is ignorant of.

Such self-deception might be considered excusable, were we deprived of the means of becoming acquainted with the progress of medical science in other schools; but it is totally inexplicable, while each of the British medical journals, more particularly the *Medico-Chirurgical Review*, contains the most complete analysis of the works of home and foreign authors, and the admirable and laborious periscopes of micrology, embracing both normal and pathological anatomy, now compiled for that journal by Doctor Lyons, with those on physiology by Mr. Gray, place the investigations made on these subjects within the reach of all.

How much our knowledge has been hitherto confined to the researches of British authors, can be best estimated by our ignorance of even the names of those who are gaining vast reputations and becoming leaders of modern medicine: it is true, we are more or less familiar with the names of Rokitansky, Müller, Andral, &c., while the researches of Virchow, Ludwig, and Bernard, have but just become known in Ireland; yet how laboriously and continuously have they worked to carry out the principles laid down by the former; how original is the character of their discoveries; how much they have altered the doctrines hitherto received as unquestionable; how familiar are their researches to the students of other schools; how far they are in advance of us, both in the true spirit and matter of scientific medical investigation.

There is but one means of imparting a new impetus to Irish medicine, by which its character may be permanently raised, and the names of its teachers and students made to rank with those of other schools. If we continue quoting ourselves, as the highest medical authorities, we are impeding our own progress, and committing direct injustice to others; nor will the animosity between the English, Scottish, and Irish schools cease, until we learn to look upon all, who are labouring in the same field, as equal to ourselves in every respect; for truth is ever the same, and equally valuable, whether it emanate from one, or another school, from a senior or a junior; and those who have devoted most time to original investigation, are the best qualified to estimate the labours of others, the least disposed to underrate the merits of their colleagues, and ever ready to excuse deficiencies inherent in man's nature.

How thankless, then, and to me most disagreeable, it is, instead of being enabled to boast of the high position the Irish school of medicine holds, to be obliged to admit, that it is many years behind the advance of medical science; and that the instruction the student receives in this country, is not equal to that given in other schools.

I know it may be argued, that four years have elapsed since I studied medicine in Ireland, and that, at that time, I was incompetent to judge of the merits or demerits of the school. To the first part of this objection I reply, that I am informed, by those who lately studied in Ireland, that the character of the instruction is the same as when I attended it; further, Irish Medical Journalism is as it was four years ago; but it is to be hoped that this will not last much longer.

As to the second part of the objection, relative to my having been, while a student, incompetent to judge of the value of the instruction I received, it must be evident, that I could form an estimate of it in no other way, than by contrasting it with that which I received in other schools; and while I repeat, that physiology, organic, and pathological chemistry are scarcely taught in the Irish School of Medicine, I know how to value the instruction I have received from the founders of the Irish School, who have been left almost unaided for the past ten years. Is the death of one of our great clinical masters, not sufficient to make us attend to the order "fill up;" alas! Gentlemen, the ranks of Irish medicine are being fast thinned, and the cheering cry of "forward to the rescue—forward for the honor of our school"—is now heard but faintly.

As the time allotted to this address has already nearly expired, I shall not detain you with any lengthened observations relative to the importance of Pathological Anatomy, for on a former occasion I had an opportunity of considering this subject together with the history of the science*; suffice it to say, that Pathological Anatomy has taken the lead in modern medicine, to which it imparts a degree of certainty, that, while it removes the oftentimes vague data from which medical opinions are derived, stamps our reasonings with a positive and demonstrative character, connects lesions with symptoms, and furnishes the medium through which the discoveries of physiology, and organic chemistry are made applicable to the diagnosis of disease, and to the elucidation of its phenomena, becomes suggestive of a rational treatment, and explains the action of remedies.

* See Pathological Anatomy considered in its relation to Medical Science, 1852.

It must be evident, that without being acquainted with the minute structure of the organs and tissues, we can never arrive at a knowledge of the agencies through which their functions are performed; hence, the Microscope must be constantly employed, and become to the students an instrument with which repeated use will make them perfectly acquainted, while its applicability to diagnosis, and its use in watching the result of treatment, will in their hands, render it one of the aids without which the physician cannot, conscientiously or completely, discharge his varied duties.

As Physiology is inseparably connected with minute structure, our attention must be constantly directed to it, as without reference to the normal functions, we cannot explain the production or consequences of Pathological alterations; and these latter must be studied by the naked eye, with instruments and chemical re-agents, before they can be recognized with that degree of accuracy necessary for the formation of a pathological diagnosis: and as every normal, or abnormal change, produces certain alterations in the chemical composition of the organ, in its secretions or excretions, it would be impossible to complete our subject without making repeated reference to Organic, and to the still more modern class of investigations included under Pathological and Histo-Chemistry.

In this manner, I hope to be enabled to make the class acquainted with the practical use of the Microscope, as also instruct them in the application of such chemical processes as are necessary to confirm microscopic observations, and render the connection between Pathological Anatomy, Physiology, Organic Chemistry, and the Practice of Medicine and Surgery so evident, that the student will be unable to resist the conviction, that in order to practice his profession as it deserves, he must consider it as a science yet in its infancy, and feel it his duty to assist in making it progress in connection with, and by the aid of, the experimental sciences.

Such is the general plan which it shall be my endeavour to carry out, to the very best of my abilities.

A course of this kind will, it is hoped, help to connect the remote with the proximate branches of the profession, and give the students

an interest in the study of subjects, the connection of which with practice has been hitherto but imperfectly demonstrated.

How pleasing it would be, had our reputation advanced within the last few years; as this is not the case, I have felt it my duty to state, as fully as time permitted, what the weak and neglected points in our system of medical education are; I have expressed my opinions plainly and am in a position to prove their correctness.

It would have been easy to find a subject in which I could have avoided any allusion to our deficiencies, but had I done so, I would not now feel the satisfaction of having done what I considered to be my duty.

Unconnected as I am with any public or private institution, and involving none but myself in the responsibility attached to these observations, I have been enabled, by this isolated position, to lay before you a few facts, which perhaps it would have been difficult for any one connected with a particular school to bring forward.

Finally, Gentlemen, leave not this lecture-room with the impression, that these remarks have the least character of personality; it is to the entire Irish School of Medicine, to teachers generally, and not to individuals they are applied.

In order to stimulate students to exertion, I have endeavoured to point out their rights, as well as the position they can take in the formation of a great Provincial School.

The closing words of this address shall be—Students, work with the best energies of heart and soul—work the great fabric of a New Irish School.

SYLLABUS OF A COURSE

ON

PATHOLOGICAL ANATOMY & HISTOLOGY

IN RELATION TO THE

PRACTICE OF MEDICINE AND SURGERY,

TO BE DELIVERED BY

THOMAS S. HOLLAND, M.D.,

AT THE ROYAL CORK INSTITUTION,

Commencing November 21st, and terminating in May.

INTRODUCTORY LECTURE.

The Irish School of Medicine as it *is* and as it *ought to be*.

THEORETICAL PART.

Excess of Blood—Congestion. Hyperœmia, &c.

Excessive Nervous Stimulus—Spasm of the Muscles, &c.

Excessive Nutrition—Hypertrophy, &c.

Excessive Absortion—Atrophy, &c.

Excess of the Organs of Locomotion, Secretion, Circulation, &c.

Diminished supply of Blood—Anœmia, &c.

Diminished supply of Nervous Stimulus—Paralysis, &c.

Diminution of the Organs of Locomotion, Secretion, Circulation, &c.

Chemical and Physical Changes occurring after death.

Dilatation, Elongation, Contraction, Compression, and Solution of Continuity, as chiefly resulting from and referrible to Physical Causes, acting upon Healthy, or Diseased Structure.

Process for the Reparation of Solution of Continuity, &c.

That variety of the Nutritive process, known by the term Inflammation.

Abnormal Accumulations of Water (?), Gases, of Fluids containing an excess of

Serum, Fibrine, Albumen, Blood, Colouring Matters, Pus and other Organic, or Inorganic Substances.

Formation, in Abnormal Situations, of Substances that exist normally in other parts, as Fatty, Fibrous, Cartilaginous, Osseous, and Pigmentary Tumours, or Degenerations of Tissue.

Formation of Substances, not existing in the Normal State, that have been described under the names of Sarcomatous, Fibro, Fibro-Cellular, and Cystic Sarcoma, Carcinomatous, Gelatinous or Colloid, Epitheliomatous, Schirrus, Melanotic, Steatomatous, Lipomatous, Cystic, Tubercular, Calcarious Tumours, or Degeneration of Tissue.

Forms of Vegetable and Animal Life, existing on or in the Human Body.

Concretions, Calculi and Calcarious Deposits.

PRACTICAL PART.

INTRODUCTORY OBSERVATIONS.

Theory of the Simple Lens.—Spherical and Chromatic Aberration.—Achromatic Lens.—Description of the Optical and Mechanical parts of Simple and Compound Microscopes.—Accessory Instruments and Chemical Re-agents.—Choice of a Microscope.—Disadvantages attending the use of high magnifying powers, how obviated.—Size of Microscopic objects, estimated by French and English Micrometers.—Study of objects that are liable to cause errors.—Method of correctly observing and describing objects.

NORMAL MICROSCOPIC ANATOMY.

Microscopic Elements (?) of the Animal Fluids and Solids.

Examination of Elementary Vegetable Structures, as introductory to the study of Animal Tissues.

Artificial Formation of Tissue. (?)

Yellow and Colourless Fibres, Supporting Tissue. (Bindegewebe.)

Cell Forms.

Circulation through Capillary Vessels.

Structure of Serous and Mucous Membranes in general, as resulting from a combination of the Three last described Structures.

Microscopic and Chemical Examination of the Normal Secretions and Excretions; as Lymph, Saliva, Milk, Bile, Urine, Semen, &c.

Examination of Arterial, Venous, Splenic, and Portal Human Blood.

Examination of the Blood of Ox, Hen, Fish, Frog, &c.

Use of Injections in demonstrating the Capillary System, illustrated by Preparations.

Structure of the Muscular, Nervous, Vascular, Lymphatic, Cartilaginous, Ossific and Dermal Systems.

Structure of Serous Membranes.

1st—Pleura, Peritoneum, Membranes of Brain and Spinal Cord, with their Involutions.

2nd—Skin and its Appendages.

3rd—Synovial Membranes, Bursæ, &c.

Structure of the Mucous Membranes, of

Mouth, Pharynx, Larynx, Bronchi, Œsophagus, Stomach, Small and Large Intestines, &c.

Structure of the Smaller Glands opening on these membranes.

Structure of the Lungs.

Structure of the Liver and Pancreas.

Structure of the Kidneys.

Structure of the Spleen, Thyroid, Thymus Glands, &c.

The Capillary System of these Organs and of the Tissues generally, will be demonstrated by a Series of Microscopic Injections of Professors Gerlach and Hyrtl.

PATHOLOGICAL MICROSCOPIC ANATOMY.

It would be useless, as well as impracticable in the present state of our knowledge, to attempt classifying this part of the subject, for as it is impossible to obtain abnormal parts in any fixed order, they must be examined as they present themselves; and the numerous Autopsies that Dr. Holland has opportunities for making, will ensure an extensive series of recent Pathological Specimens being laid before the Class.

THE GENERAL OBJECT OF THE COURSE being to demonstrate the necessity for the special study of Pathological Anatomy, as the basis of Modern Medical Science, and prove that by it *alone* Diagnosis can be confirmed, Symptoms connected with Lesions, and a system of Rational Therapeutics formed, it is evident, that while treating of Normal and Abnormal Structures, repeated reference must be made to Physiology, Pathological and Histo-Chemistry (Lehmann): thus the intimate connexion of the Proximate with the Remote branches of Medical Studies, between Science and Practice, will, it is hoped, be clearly demonstrated.

FEE TO THE COURSE, TWO GUINEAS.

Further particulars can be obtained from Dr. HOLLAND, No. 15, George's Street, Cork.

On the Defects, with reference to the Plan of Construction and Ventilation, of most of our Hospitals for the reception of the Sick and Wounded.

By Mr. John Roberton.

[Read March 20th, 1856.]

By an apt and beautiful form of expression, the air we breathe is called in the Scriptures "the breath of life;" when we cease to respire it, we die. If we should inhale some other kind of air, or atmospheric air much contaminated, this would prove to us, not "the breath of life," but that of sickness or of death. How significant the words! The atmosphere is God's common gift, as free to the peasant as to the prince; and yet, strange to say, in a large proportion of human dwellings, and of vessels as they navigate the sea, the admission and circulation of the air are unduly limited and impeded; and not seldom, the supply, such as it is, is allowed to become so impure as actually to generate disease.

The ignorance as to the indispensable necessity of air for the maintenance of life would be incredible, did we not so often witness it in connexion with its deplorable consequences. I will mention two or three facts by way of example. I happened on one occasion to be at the door of an inn in a country town, when a stage coach drew up, and the passengers alighted for breakfast. One of them, a gentleman, before going within, called to the guard to let out his dogs; which, on some account—perhaps the convenience of his fellow passengers—he had lodged behind, in the boot. The guard accordingly opened the boot, and, to the astonishment of the gentleman, dragged forth his dogs, a pair of fine pointers, dead. It had not, seemingly, occurred to the owner or to the guard, that animals cannot exist without a proper supply of air. Had the side walls of the boot, near the roof, been perforated by rows of holes, one row running parallel to the other on opposite sides, the dogs would have lived, because their prison, small though it was in cubic air space, would, in that case, have been in communication with the external atmosphere, and have partaken of its currents; but the air in the boot, remaining without renewal, was speedily robbed of its oxygen, and at the same time, it acquired from the lungs of the animals, the qualities of a deadly poison. Again, in the winter of 1848, the deck passengers of an Irish steamer, the "Londonderry," were ordered below by the captain, on account of the boisterous state of the weather, and the hatches closed; the consequence was, that of 150 persons, no fewer than 70 were suffocated by morning. And quite recently, as we learn from a letter in an Oriental newspaper, "The China Mail," an American ship, named "The Waverley," from Amoy, bound to Lima, with 442 coolies on board, put into Manilla; and, as dysentery prevailed among the coolies, the vessel was put under quarantine. Some disturbances having in consequence of this procedure occurred on deck, the mate and crew forced the coolies into the hold and battened down the hatches; when opened, about fifteen hours afterwards, 251 were found dead from suffocation. A late writer on ventilation does not hesitate to assert, that could we suppose a highway formed on the bottom of the sea, between the Gulf of Florida and the Gold Coast, it might be covered, from end to end, with the carcasses of those Africans who were suffocated in the holds of Guinea-men, and then thrown overboard.*

It is not enough, however, that there be atmospheric air to sustain life, and no more; it must be *in excess* so to speak, else the air emitted from the lungs will at length so deteriorate the other, as to cause a variety of injurious effects. Here, again, I may illustrate my meaning by an example. Once when

* Bernan on Warming and Ventilation. 12mo. 1845.

inspecting a workhouse I asked to be shewn the nursery, and was taken down a flight of steps into a deep cellar, where were a number of infants, some at the breast, and others hand-fed; but all, without exception, irritable, pallid, and miserable. Nor can we doubt, I think, that the brawls and the gross intemperance common among persons inhabiting cellars, the honeycomb cottages in narrow courts and lanes, and over-crowded and unventilated tenements of other descriptions, are owing, in no small degree, to those feelings of discomfort which are the effects of impure air.

But graver consequences still than these arise from vitiated air. Of all the aërial poisons, none, perhaps, is much more hurtful to man than his own expelled breath, when detained long around him and breathed again.* Not long ago, I had occasion to inspect the dormitories in a school, in each of which fourteen boys had for some time slept, with a cubic air space for each boy of barely 140 feet. Ere long, the ill effects naturally to be expected, appeared; seven of the boys and two of the masters sickened of typhus; and the school had for a time to be broken up.

It may, perhaps, be conceded, that a number of our gaols are now tolerably salubrious, but it was otherwise not long ago; and if we advert to what, from a late report, is found to be the condition of gaols in British India, we shall discover the most appalling results on the health and life of the prisoners, owing to a disgraceful, nay, criminal, neglect of ventilation. This report occurs in a work on the Public Health of Bengal, by Dr. Mackinnon, published in 1848. The number of prisoners in the gaols is usually about 40,000, chiefly natives; and the annual average mortality of the whole had recently been one in ten, rising in some instances to 26 per cent. or more than one in four; a rate easily accounted for, when it is known that in no instance is there an allowance of more than 300 cubic feet of air space for each individual; whilst, in some instances,

* This idea is Dr. Arnot's.

70 cubic feet is the murderous average.* To arrive at even some faint conception of the cruelty of this deprivation of an adequate supply of air, it is necessary to know that the daily actual *consumption* of air by adults, has been found, by experiment, to vary, according to circumstances, from 306 to 398 cubic feet; that much of what is not consumed, is, as before stated, defiled by mixing with the products of respiration; and that the smallest cubic air space that can safely be assigned for one individual, unless there be arrangements for a continual renewal of the air, is from 800 to 1000 cubic feet. When we speak of a rate of mortality in gaols so high as the foregoing, we ought—if, indeed, imagination can portray them— to think of the antecedents to these deaths, I mean the feelings of misery in which the prisoners are compelled to pass their existence; for it may well be said, that in such abodes *they* are the most fortunate who the soonest die.†

The defects in the construction and ventilation of such buildings as schools and gaols, where persons in a state of health pass the whole or only a portion of their time, though a subject of the greatest importance, does not lie within the scope of my present purpose; and I have cursorily adverted to it, only by way of introduction to one of a far different nature,—the construction and ventilation of buildings destined for the reception and treatment of the sick and wounded,—a subject, I say, of a far different nature; for I shall be able to shew that, in the construction and ventilation of Hospitals, if they are to subserve the end for which such institutions are professedly opened, we must have regard to some things that do not much concern us when planning other kinds of buildings.

* Carpenter's Principles of Human Physiology. 4th edition, page 554.

† I beg here to refer my readers to the Chapter "On Respiration," in Dr. Carpenter's Physiology, a chapter which ought to be printed in a cheap form and widely circulated, for general enlightenment on matters of the greatest moment, concerning which mankind, as yet, are in a state of surprising ignorance. The recent work of Dr. Arnot, "On the Smokeless Fire-place, Chimney-valves, and other means, old and new, of obtaining Healthful Warmth and Ventilation," 8vo. 1855, is likewise well deserving attentive perusal.

It is well known to the medical profession, that most of our Hospitals are, at times, unhealthy; insomuch that patients carried thither, instead of obtaining a cure, grow worse; and, occasionally, owing to the breaking out of an infectious malady—known by the name of hospital gangrene, die rapidly in considerable numbers. But even should this scourge not show itself, and there be no very high rate of mortality, the health of the inmates will often deteriorate, so that wounds, fractures, burns, ulcers, and other forms of surgical disease, are cured, if at all, only after great lingering and suffering, — lingering and suffering dependent, in general, on the insalubrity of the wards; in other words, the absence of a pure atmosphere.

I have long thought that in constructing Hospitals we have been in the habit of confounding together two things widely different, namely, *sick wards* and *dormitories;* wards, where the sick and wounded lie continuously throughout the day and night, with dormitories occupied by the healthy for only eight or nine hours in the twenty-four;—of confounding wards—where cubic air space, though highly important, is a secondary consideration to the getting rid of fœtid and pestiferous exhalations by a continual renewal of the atmosphere—with dormitories, in which ample cubic air space is all that is required. It has been owing to ignorance or inattention to this essential difference between wards for the sick and dormitories for the healthy, that we have few Hospitals in England that are not insalubrious whenever they chance to be crowded; and which, when crowded with such cases as burns, compound fractures, and extensive ulcers, are often the abodes of death, occurring in forms most humbling and mortifying to the pride of surgical science; since the surgeon, in such circumstances, is aware that the poor sufferers have been carried to a public institution to their destruction; and that had they been treated by him in their own homes, howsoever humble these might be, the chances of recovery would have been greater.*

* I have said that the cubic air space of a ward, though a matter of high importance, is secondary to another consideration. I regret to find that the air space for each bed in a number of our provincial Hospitals is not half what

But there is another point that has been hitherto overlooked, as to our English Hospitals; and, mainly, from inattention to the essential difference, above mentioned, between sick wards and dormitories: I refer to arrangements calculated to prevent the creation of what may be denominated *an Hospital atmosphere*, which arises from the wards communicating with one another by passages and stairs. It is owing to this kind of intercommunication that, if a foul state of the air happen in only a single ward, such foul air spreads and speedily pollutes the entire building. In a few of our Hospitals the plan of construction is good; in the majority, bad; but in not one of them that I have seen, is the plan such as to render impossible the formation of an *Hospital atmosphere;* yet this all-important object has been attained on the Continent in several instances, where we have a plan of construction at once ingenious and perfectly successful,—a plan that, when first seen and understood, never fails to excite feelings of pleasure and admiration. I now allude, more particularly, to the Bordeaux Hospital, the most attractive, altogether, that I have examined; although it must be admitted that the Saint John's Hospital, Brussels, the new Lariboissaire and the Beaujon Hôspitals, Paris, are built after the same plan, and are, perhaps, not very much inferior. The peculiarities of these buildings, the points wherein they differ from our Royal Infirmary, for instance, I will endeavour to make plain by means of a lithographed sketch of the ground plan of the Bordeaux Hospital.*

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it ought to be. In a clean and in other respects well-ordered Hospital in a neighbouring town, which I recently visited, the cubic air space in some of the wards was little over 600 feet for each bed; the average per bed for the whole of the wards being only 715 feet. I apprehend that the cubic air space per bed ought never to be less than 2000 feet.

* Certain new wards in St. Thomas's Hospital, Southwark, are, I am informed, on an excellent plan; but as I have not had an opportunity of inspecting the plan, I can only make this reference to it. I have personally examined the Brussels Hospital, and the Beaujon and Lariboissaire Hospitals, Paris. The latter, which has only been opened about two years, is well worthy of a visit. My friend Mr. Richard Johnson, who was recently in Paris, sends me an interesting account of the Lariboissaire, and pronounces it to be "truly a palace for the sick."

Let me first, however, describe our own handsome Infirmary, which may fairly represent a number of our larger Hospitals. The plan of the interior differs very little from that of a vast hotel: the building forms three sides of a square, and, with the basement, consists of three storeys. The basement is occupied by the Board, the accident, and the out-patients' rooms, the library, and apartments for the various officers and students. On reaching the first storey, the plan is at once obvious. A corridor is seen dividing the floor longitudinally, so that the wards, entered from the corridor on either hand, have, necessarily, windows on one side only, and a dead wall—the wall of the corridor—on the other. This arrangement prevents a thorough circulation of the external atmosphere, such as can always be had where the ward has windows facing one another on the opposite side walls. This is one evil; but another evil still greater is the facility with which—when one of the wards of a particular storey is foul—the corridor conducts the polluted air to all the wards opening from it; whilst, again, the grand stair and the several side stairs, by connecting the corridors in the different storeys, produce the ill effect I before mentioned, a general foulness, an Hospital atmosphere. Let there be one foul ward, and a plan of construction such as now described, and it inevitably follows, that the foul air will circulate throughout, and pollute the entire building.

The Bordeaux Hospital is constructed in a totally different manner; so different that, to one unacquainted with it, the idea would hardly occur. To myself it was novel, and so obviously admirable, in the two-fold sense of securing thorough ventilation, and rendering impossible the formation of an hospital atmosphere, that I was delighted. Novelty has a charm of its own, but when this is combined with the highest utility, the feeling of pleasure is all the greater.* Standing in an open space of ground, called the Place du Fort du Hâ, we look on

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* I copy the following notice on the face of the published plan, regarding the origin of this noble institution—"Grand Hospital de Bordeaux, dont la construction a été autorisée le 8 Juin, 1825, par une ordonnance du Roi."

a fine building, the frontage extending, perhaps, 140 yards. Passing in at the centre gateway, we behold a beautiful court, of about a quarter of an acre, planted with evergreens and flowering shrubs, surrounded by a carriage drive; and, beyond the drive, by a light arcade or ambulatory which serves to connect, on the two sides facing each other, a succession of pavilions or tiers of buildings standing parallel and having the ends towards the square. We step under the arcade, and above a door opening into the basement at the end of one of these pavilions we see the words "Salle Seconde." We enter, and discover a ward about 140 feet long, 30 feet wide, 19 or 20 feet high, having tall, narrow windows, directly facing each other on the opposite side-walls, containing thirty-eight beds—nineteen on either side, and each bed—the bedstead small and of iron—hung round with white dimity curtains, but having no tester.* Near the entrance is a room for the sisters or nurses, and at the extremity of the ward, a door on the right hand leading to clean, well-ventilated closets, and a door on the left to a spacious lavatory.

After surveying the general aspect of the ward, we feel tempted to look out at one of the windows, and are surprised to see a beautiful garden, planted with vines and roses—the garden surrounded by a neat footpath. We cross the ward, to discover what there is on the other side, and find a garden resembling the one we have just seen. The patients, whenever they chance to approach a window on either side, look into a beautiful garden.

Having surveyed one ward, we ask the way to the next, and receive for reply "There is only one door; you go out at the door by which you entered." Thus we discover the important fact, that as we entered this ward from the open air, so must we emerge from it again into the air. Once more under the arcade, we proceed towards the next pavilion, and find that, extending

* These measurements are probably not quite exact. Moreover, as will be seen by the ground plan, the wards are not all of the same length; several of them are for children between the ages of six and fourteen years; and there is a small maternity ward.

between the pavilion we have left and this one, is a light iron railing, through which we see one of the gardens already spoken of. There is a gate—we enter: the garden is in length the same as the ward, in breadth about fifty feet. On stepping into the ward next in course, we find it a copy of the former; and now we come to perceive that, as each pair of pavilions has a garden intervening, the windows of the wards look into gardens. Having examined the wards on the basement story of each of the separate pavilions, five in number, on this side of the square, we ask how we are to reach the wards in the second story, and are pointed to a stair at the end of the arcade, which winds up to a like open arcade above, out of which the wards are entered in the same manner as below. Every ward, I repeat, has one—only one door. You enter from the open air, and when you seek to return, your exit must be by the same door again into the open air. It follows, of course, that each ward is itself *a separate hospital*, having no communication with the other wards; so that if we were to suppose one of these to be crowded with the worst kind of surgical maladies for causing foulness, the foul air could not find a passage into any other ward—an hospital atmosphere would be impossible. I need hardly say, however, that the ventilation by windows being such as I have described, no ward need be allowed to become foul.

Another advantage, not to be overlooked, attaches to this plan of construction; there is no need to limit the size of the hospital or the number of beds. In England, where nine-tenths of the hospitals are on the plan of an hotel or a large dwelling house, we are afraid to open a large hospital. It has long been a painful conclusion of experience, that the larger the hospital, the higher the rate of mortality. Our Infirmary has little over 200 beds, rarely that number occupied, and yet, when the house is pretty full, the health of the patients, it is said, soon deteriorates; whereas, on the continent, several of the finest hospitals accommodate from 600 to 800 patients. That in Bordeaux has 710 beds for the ordinary class of patients, and eighteen beds for paying patients. The number of patients of both classes in the wards, when I was there in 1855, was about 550. In an hospital such as this, if you were only to extend sufficiently the size of the court, and to multiply sufficiently the number of the pavilions containing the wards, thousands of sick might be lodged without inconvenience—without the slightest risk of generating an hospital atmosphere.*

I have admitted that the construction of some of our Hospitals is tolerably good. In these, the floors are not divided by corridors, but every ward occupies the breadth of the floor, and has windows on the opposite side walls, through which, when they are thrown open, currents of air freely circulate and purify the apartment; an immense advantage this, it will be admitted, over the plan of our own Infirmary, in which, as we have seen, the wards, with windows on one side only, have not the benefit of transverse currents. Here I would express myself without any reserve; when a ward has windows on one side and a dead wall on the other, it cannot, generally speaking, be healthful; the construction is after a method radically bad. But even in the best of our Hospitals, (and one of them—the Middlesex—we shall find is a model for its ventilation,) the plan of the building allows the generation of an Hospital atmosphere.

By the ventilation of a ward, it will have been observed that I mean the admission into and circulation through it of the external atmosphere; not, necessarily, at all times by open windows, but, when circumstances require, through perforated plates of zinc, having the apertures so small as to rob the air currents of what in them is disagreeable or hurtful to the sick. I have little faith in scientific ventilation, so called,—whether the

* From a notice in "Le Sièele," of May 14th, 1855, it appears that a new Hotel Dieu is likely to replace the present old unwholesome structure. The new edifice will stand—as the old, in part, does—in the Ile de la Cité, on a triangular plot of ground of about five and a half acres, between the Rue D'Arcole and the Quai Napoleon, and it is to lodge as many patients as the old Hotel Dieu, viz. 800, in wards of thirty-six beds each. From an allusion to the Lariboisaire Hospital, I infer that the contemplated Hotel Dieu is to be constructed after the same plan; the site, with the houses on it, is to cost about ten millions of francs, and the new buildings from five to six millions more!

downward mode, the upward mode, or the circuitous mode. I should almost as soon think of looking for my daily supply of water for purposes of ablution, from the scientific formation of it out of its aëriform elements by galvanic agency, as of depending upon such refined expedients for the purity of a sick ward. If a ward is to be kept perfectly sweet,—*the air must flow through it in correspondence with the natural movements of the atmosphere without.* Let the windows of the opposite side walls—tall windows, they ought to be tall, reaching near to the ceiling—be thrown open; and, instantly, the air enters at one side and escapes at the other, the side of admission being determined by the direction of the wind at the time. Sometimes the air is entering by the windows on a particular side—the wind shifts, and now it enters on the other side and escapes by this. There is an unceasing flow of the atmosphere, mostly parallel to the surface of the earth, which fans and purifies every object it is permitted to embrace. A perfectly stagnant condition of the external atmosphere—if it ever exist—is extremely rare. I therefore repeat, that curious and refined modes of ventilation, which may answer for entertaining rooms, public offices, and other kinds of apartments occupied by persons in a state of health, fail when applied to an Hospital, where effluvia from the bodies of the sick, animal matter from their breath, and the fœtor from ulcers, wounds, burns, and from vitiated excretions, combine to pollute the atmosphere, so as no ventilation can dissipate, other than Nature's,—I mean the ceaseless, it may be *imperceptible*, flow of the external air through the wards. *This mode, and no other, is worthy the name of Hospital ventilation.*

The windows in a ward, not only for the sake of ventilation, but the admission of light, ought to be TALL. In most of our Hospitals—in all the provincial Hospitals I have examined—the windows are short, not reaching to within a number of feet of the ceiling; in consequence of which, the upper stratum of air—supposing the windows opened—does not escape. Moreover, the beds ought to be so arranged along the walls as not to stand directly opposite a window. The lithographed sketch will show how well this is managed in the wards of the Bordeaux Hospital. In many of our Hospitals, if you open a window, the air rushes upon the bed, and that, too, unprotected by curtains.

I have before said that open windows are not always admissible; in certain states of the weather an unrestrained circulation of air would be disagreeable, or even hurtful to the patients. In a number of Hospitals, the windows, by a simple mechanical contrivance, are thrown open to any extent that is thought desirable,—to the width of an inch or of the entire window; but howsoever guardedly this kind of ventilation may be managed, it causes, in stormy weather, draughts, of which the patients are sure to complain, and which they will obviate, when they can, by closing the windows. The difficulty, happily, in this case is not insurmountable. By means of finely perforated zinc plates, the air-currents may be made to percolate into the wards in so subtle a manner as to be robbed of *sensible* draughts, and thus the blessing of pure air be obtained, as it were, by stealth. The use of this invention is, as yet, I imagine, very limited in Hospitals. I am, however, able to describe a beautiful instance of its application I witnessed when last in London.

About half-past seven in the morning of May 16th, 1855, I entered one of the wards of the Middlesex Hospital; the ward had windows facing each other in the opposing side walls, was very lofty, and not over-crowded with patients. I was struck by its freshness, and remarked to my attendant, "This ward is as sweet as a field, I am delighted with the absence of unpleasant smells." He replied, "If it is sweet now it must be sweet at all times, for the patients have not been moved, nor anything done." Before entering the Hospital, I had noticed iron gratings in the external walls; and now, on casting my eye upwards, I found there were, near the ceiling, plates of perforated zinc, corresponding to the gratings without; five such plates, about 10 in. in depth and 15 in. in breadth, in either side wall, facing each other,—in all ten; so that the ward, throughout the night, had partaken of the movements of the external atmosphere;

yet so moderated, by having to pass through the perforated plates, as to be completely robbed of sensible draughts. Moreover, not only were there no draughts, but the great height above the beds at which the admission of air took place, (a point of much importance,) prevented the patients from feeling any sense of chillness by its descent upon them. Here was a beautiful mode of ventilation for the night and for stormy weather, when the windows and doors being, but too often, closely shut, a supply of pure air is especially needed. In calm weather, there can be no objection to the guarded transmission of air by the windows even in the night, especially when a canvas blind or a thin curtain covers the openings, and the beds are protected by light hangings; but when the stormy character of the weather renders this unadvisable, (and in our climate it will often happen,) the contrivance found in a number of the wards of the Middlesex Hospital surely deserves to be universally known and adopted.

Although openings near the ceiling—such as have been described—are much to be preferred to apertures lower down, yet where such openings have not been provided, a substitute for them may be found, by having one of the upper panes of glass in each of the opposite windows full of small slits to admit air, and, to moderate the force of the air-current thus admitted, a plate of very finely perforated zinc over the inner surface of each of the panes.

It will here not be out of place to remark, that a visitor may easily be deceived as to the sweetness of the wards of an Hospital, if he be content to pay his visit in the forenoon, when official persons are moving about; when everything offensive has been carried away, and when, probably, a number of the windows and doors are open. At this time nothing offends the organ of smell. But let him go in the evening, in the night, or early in the morning, and then he may chance to receive a less agreeable impression. I speak from personal experience. Patients when left to themselves (as they generally are at those times when the nurses do not expect the visits of the medical attendants,) are almost certain to close the windows; and during perhaps sixteen hours in the twenty-four—supposing no admission of air beyond what it is in their power to interrupt, and the wards crowded with the surgical class of diseases,—a visitor will find a very different state of things in, at all events, a number of our Hospitals; the inmates restless and feverish, the countenances of all wearing a look of depression, and the air abominable.

I hardly know how to speak concerning the artificial heating of wards. Beyond open fire-places or open stoves, I believe artificial modes of heating to be injurious. In an Hospital expressly designed for diseases of the air-passages and chest, an artificial climate in the winter and spring may, for aught I know, be necessary; this is a point on which I do not raise a discussion, beyond the remark that I am inclined to think that, even as regards this class of patients, some kind of respirator would be better. But, with respect to patients of every other class, plenty of warm clothing, and a cool sweet ward, answer best. When we talk of heating a ward, we are apt to forget that heat promotes the decomposition, the rapid decomposition, of all the excretions produced in so many ways, especially in a ward for surgical patients; that the sick are generally feverish in the evening, if not throughout the day; and that we cannot more certainly increase their discomfort than by surrounding them with an unnaturally *dry*, hot, atmosphere; the temperature of which, too, is sometimes by neglect and mismanagement rendered perfectly tropical.

I have hitherto refrained from alluding to Lying-in Hospitals, but may here be permitted to remark, that the same observations in reference to plan, ventilation, and artificial warming, which I have made concerning Hospitals for the sick and wounded, are applicable in an equal degree to Hospitals for the lying-in; still more applicable I might say, since it is notorious that in perhaps all existing Lying-in Hospitals, the mortality,

as respects both the mothers and infants, is higher than that which is found among the poorest class of women confined in their own habitations.

There are various other things, attention to which promotes the salubrity of an Hospital ward; as, for instance, that there be a discharging shaft in the wall, shut by a sliding cover, by which soiled clothes, fouled dressings, and the like, are at once passed to the wash-cellar; that the ceiling and walls be painted and highly varnished, in order to prevent (what is so apt to happen when lime-washing is practised) the imbibition by the plaster of effluvia; as well as that the surface of both ceiling and walls may be readily cleansed. That there be no furniture in the ward beyond what is absolutely necessary; that there be an eating room for convalescents, to avoid in the ward the smell and vapour of cooked food; that, with respect to the persons of the patients and nurses alike, and to every article of clothing and bedding, there be the most scrupulous attention to cleanliness; and, lastly, that the dressers, whether medical students or nurses, be not permitted to carry fouled sponges from patient to patient, as, without a watchful eye over them, they are so apt to do. I need hardly say, that the occasional use of the warm or tepid bath, and at all events, of the foot bath, in the case of both patients and nurses, is most desirable. A single pair of neglected feet even, will, in the night, affect the sweetness of the surrounding air.

In conclusion, I will venture a word concerning the proper site for an Hospital. When a person of sense determines on building a dwelling-house, the salubrity of the site is a point never overlooked; but how rarely in this country do we give the same thing a moment's consideration with reference to an Infirmary! Our fever and general Hospitals are usually built in some populous and central spot of our large towns, selected, as is alleged, that the Hospital may stand conveniently for the medical staff residing around, and that the sick and the hurt may be carried thither with as little delay as possible. These reasons are more specious than weighty; for, assuredly, if a cure is to be obtained, then must the *salubrity* of the Hospital be a primary, not a secondary, consideration. I do not mean, of course, that it is not important that the hurt should receive speedy assistance; they ought to receive assistance with the least possible delay; and, instead of having to be carried directly, in all instances, to an Hospital, there ought to be Accident Rooms conveniently situated—one such room in, for example, each of the larger municipal wards in our populous cities. When walking about Paris, one sees in a number of places written up in large characters the words *Secours aux blessés;* meaning, that *here* accidents are promptly attended to without the sufferers having to be taken, it may be, to a remote Hospital before the wound is dressed, the dislocation reduced, or the broken bone adjusted. With Accident Rooms provided such as these, the only argument worthy of notice for erecting an Infirmary in the centre of a large manufacturing town, enveloped in its cloud of smoke, is satisfactorily disposed of. But, if any should still object, let me remind them that this is a sceptical age regarding the unaided powers of the Materia Medica; that whilst there are many persons very apt to descant on the uncertainty attaching to the results of the most skilful medical practice apart from cleanliness and pure air, there are perhaps none who would not at once concede that a removal of the sick poor from their own cottages and cellars into wards so airy and cheerful as those of the Bordeaux Hospital, confers, in itself alone, the most important benefits; and the medical staff, too, would doubtless, in the case supposed, be the first to applaud arrangements so wisely designed to aid their efforts for the good of their patients. I will add, with respect to the choice of a site, that it ought, if possible, to be on an elevation, to the windward of the city; having a soil naturally dry, or admitting of easy drainage; and that the plot of ground ought to be large enough to include gardens, not merely to please the eye of the sick, but to provide, as well, the means of recreation and exercise for convalescents.

POSTSCRIPT.

Since this Paper was in the hands of the printer, my attention has been drawn to the following instructive passage in Professor Simpson's "Obstetric Memoirs and Contributions," published last year, with reference to the Edinburgh Maternity Hospital and Hospitals in general. Without, perhaps, concurring in all the Professor's recommendations, I cannot but think that the sentiments of so experienced and acute a mind as his, on a subject which so deeply concerns suffering humanity, will be read with interest.

"The convalescence of the [Maternity] Hospital patients was often interrupted by febrile and inflammatory attacks. The house, 3, St. John-street, used as an Hospital was, in addition to a sunk kitchen flat, three storeys in height, with two rooms in the first and second flats, and three in the third; and it was much too small for the accommodation of the patients, and of the resident house-surgeons, matron, &c. The rooms themselves were low-roofed, and very imperfectly ventilated. Various plans were attempted to improve the ventilation, but not with much success. Whenever the Hospital became in any degree crowded, fevers, (or weeds,) with more or less abdominal tenderness, appeared among the patients; and, frequently, the supervention of such attacks during convalescence became so common, as to constitute the rule rather than the exception to it. Every one acquainted with hospital practice, whether obstetric, surgical, or medical, is well aware of the great liability among the patients to febrile and inflammatory attacks, whenever the wards are over-crowded; and in no practice is this more visible than in midwifery. Indeed, I believe there are few or no circumstances which would contribute more to save surgical and obstetric patients from phlebitic and other analagous disorders, than a total change in the present system of hospital practice.

"I have often stated and taught that, if our present medical, surgical, and obstetric hospitals were changed, from being crowded palaces with a layer of sick in each flat, into villages or cottages with one, or at most two patients in each room, a great saving of human life would be effected. And if the village were constructed of iron, (as is now sometimes done for other purposes,) instead of brick or stone, it could be taken down and rebuilt every few years; a matter, apparently, of much moment in hospital hygiene. Besides, the value of the material would not greatly deteriorate from use; the principal outlay would be in the first cost of it. It could be erected in any vacant space or spaces of ground, within or around a city, that chanced to be unoccupied; and, in cases of epidemics, the accommodation could always be at once and readily increased."
—Pages 856 and 857.

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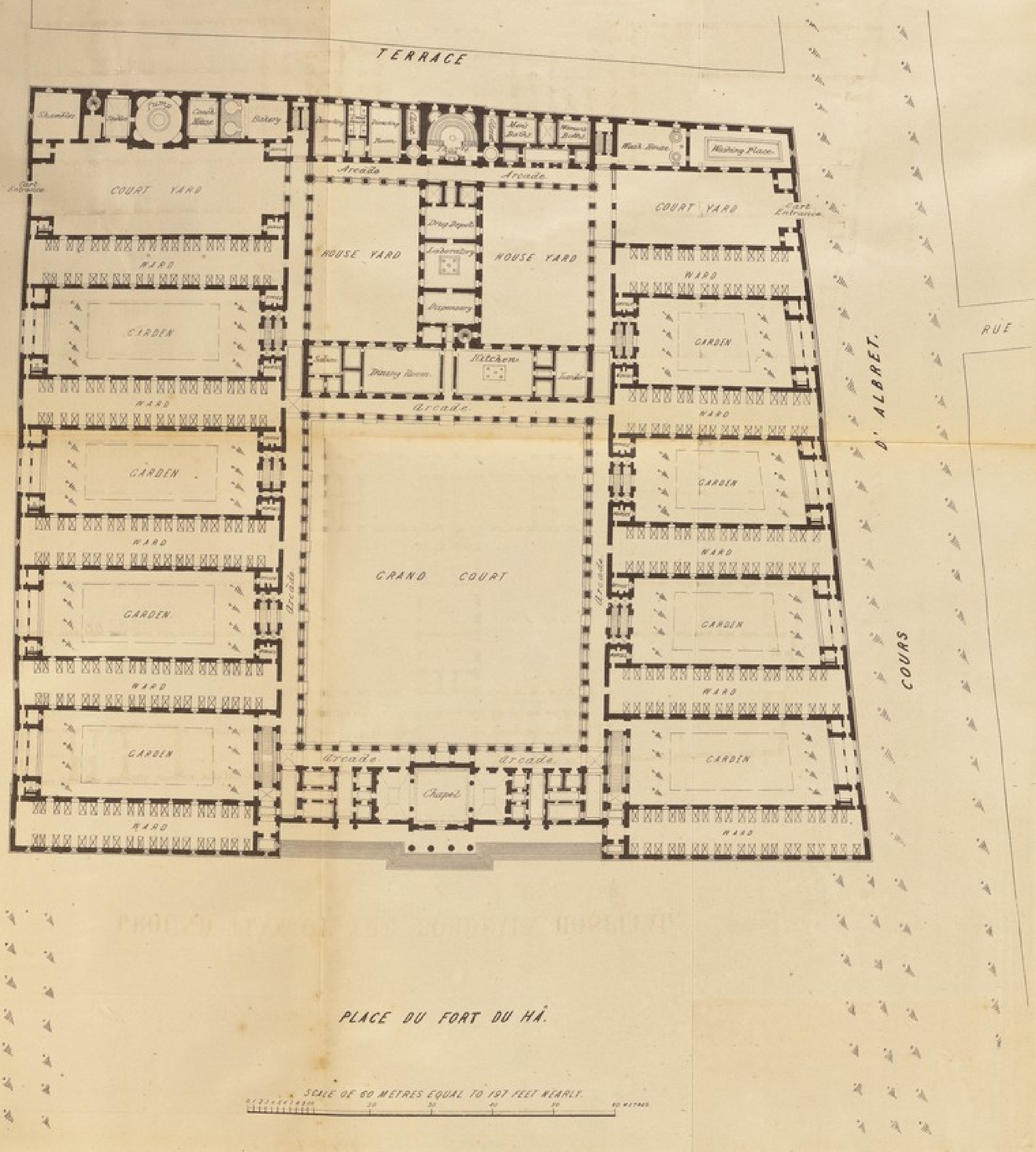
GROUND PLAN OF THE BORDEAUX HOSPITAL.

SEE PAGE 6



A

CONTRIBUTION

TO

SCOTTISH ETHNOLOGY,

BY

JOHN BEDDOE, B.A., M.D.

" Hæ nugæ in seria ducunt."

LONDON:
H. K. LEWIS, 15, GOWER STREET, NORTH;
EDINBURGH: MACLACHLAN AND STEWART.

1853.

INTRODUCTORY CHAPTER.

When I first commenced the study of Ethnology, and was eagererly perusing the pages of Prichard, Lawrence, and Latham, I could not help regarding with amusement and interest the question so learnedly argued by the former, whether the ancient Gauls were a xanthous or a melanocomous race; and whether the dishevelled locks of the followers of Brennus, the "horrid hair" that shook forth for the Romans "pestilence and war," were really black, or brown, or red, or yellow.*

Prichard disposed of this question very much to his own satisfaction, though not entirely to that of some of his readers. But if it be difficult for us to ascertain the complexional peculiarities of the Celts of 2000 years ago, it appears to be a no less puzzling task to determine those of their representatives at the present day. One would suppose, perhaps, that such a question might readily be settled by the first person who might choose to open his eyes to facts as palpable as the nose on his neighbours face: but in truth it is not so. The eye may rest upon a great many sets of features in the course of a long day's travel, but the mind will retain but few of them photographed on the tablet of memory, and those few will probably be such as have presented striking peculiarities, or have belonged to the persons brought most frequently and nearly into the company and contact of the observer. This fact, together with the inveterate tendency of so many scientific observers, to see everything as they wish and expect it to be, and not as it is, may account for the striking discrepancies among ethnological writers on this simple matter of fact. Thus it comes to pass, that some attribute blue, others black eyes to the great majority of the Irish; some describe the men of Kent as particularly fair; others as "assimilated to the dark com-

* "The Gaul shall come against thee,
From the land of snow and night,
Thou shalt give his fair-haired armies
To the raven and the kite."

Macaulay's Prophecy of Capys.

plexioned inhabitants of the opposite coast;" and one French writer, in defiance of all other observers, affirms that blue eyes and fair hair are the special characteristics of the native Parisian. The minister of Wick describes his parishioners as having for the most part dark brown or black hair and dark complexions; remarkably few having red or yellow hair. My own impressions on first visiting the place were quite of an opposite nature, and they were confirmed by an enumeration of the complexional characters of more than 300 individuals.

Similar discrepancies are manifested whenever any one attempts to define the prevailing complexion of the continental Teutonic tribes, or of the Slavonic, or of almost any other race. Take for example the Croats. One writer* talks of their "shaggy black locks," and another† of "their Slavonian characteristics of blue eyes and fair hair." I could quote two or three other descriptions of their persons, which only agree in differing each from the other. Take again the Laplanders. Some describe them as black, others as red-haired: of the only two individuals who ever came under my observation, the hair did not even approach either of those colors; in the one case it was of a deep chesnut, in the other dark brown.

At the first blush, it may seem to be a matter of little or no importance to us whether a particular race be as fair as angels or black as crows. I however think otherwise, and in so thinking follow greater men than I can ever hope to approach. Among these was the lamented Prichard, who having collected a vast mass of facts relative to the complexional characters of various nations, used them as a powerful buttress of that elaborate argument, by which he succeeded in bringing into harmony with the Mosaic record the opinions of the larger section of British ethnologists.

Dr. Prichard himself appears at one time to have entertained the opinion held also by Lawrence, Hamilton Smith, Knox, Kombst, and many continental ethnologists, that complexional as well as anatomical peculiarities are permanently hereditary in the races to which they belong. In his Inaugural Dissertation, he talked of "the Celtic race, with black hair and eyes, and white skin verging to brown, occupying the west of Europe—to

* Paget.

† The author of the "Frontier Lands," &c., who appears to have paid some attention to this subject.

this" (said he) "belong the ancient and modern inhabitants of France, &c., and the ancient Britons, Welsh, Bretons, Irish, Scotch and Manx." He then proceeds to attribute to "the great German race, characterised by its blue eyes, yellow or reddish hair, fair and red skin,—not only the Saxons and English, but the Caledonians or Picts, and the Lowland Scotch, who have sprung from them." He here evidently means to account for the frequency of red hair among the modern Scotch, by its being the original characteristic of the Caledonii, whose "rutilæ comæ, magni artus," are commemorated by Tacitus.

Lawrence again (ed. 1840), says that the "light rosy skin, flaxen hair and blue eyes of the German race, are now, after 2000 years, just as strongly contrasted with the brownish-white skin, dark hair and eyes of the Celts, in those situations and families where the blood has remained pure, as they were originally." Kombst, who holds the same opinions, is obliged to account for the blue or grey eyes of the Highlanders, by a gratuitous mixture of their blood with that of the Norwegians, ignoring the fact that light eyes are about as prevalent among the inland clans, whose territories were scarcely ever invaded by the Norsemen, as among the islanders and coastmen, who acknowledged the sway of the fair-haired sea-rovers, during a period of several centuries.

The opinions just now ascribed to Dr. Prichard were almost wholly relinquished by him at a subsequent period, as may be learnt from many passages in his "Researches." "In different parts of England," says he, "considerable varieties of complexion may be noted, but they are not referrible to particular races. In Cumberland, where the population is supposed to be in great part Celtic, the women are remarked as particularly fair and light-haired. In North Wales a fair complexion and blue eyes prevail, according to both Dr. Macculloch and Mr. Price: there is probably no part of Britain where the inhabitants are less intermixed with Saxon or German blood. * * * The prevalent characters in a great part of the Western Highlands are rather dark brown hair, uncurled, with a complexion not very fair, but with grey eyes."

The obscurity in which the subject appeared to be involved, induced me to enter on an inquiry, which but for the explanations I proffer might appear of a very trivial nature. I conceived the idea of submitting the points in dispute to the test of personal observation checked by numerical comparison, and thus laying a firm foundation for the ethnological theories of others. I did not enter on this enquiry with the view of establishing a foregone conclusion, nor yet with any exaggerated notions of the direct importance and signification of the differences in physical character among different races of men. But I did and do consider it not only desirable but necessary to the establishment of ethnology on a firm basis, that much attention be given to determining *what* degree of import they really have. One can hardly expect people who differ about fundamental facts, to agree in the theories which they ground thereon. Accordingly we find that the complexional peculiarities of our countrymen are used by one set of ethnologists to prove the absolute and everlasting permanence of complexional characters, and by another set to prove that they may change entirely in the course of a very few centuries or even generations. If I had any expectation that this little monograph would meet the eyes of any except a few ethnologists, I should think it desirable to state briefly a few of the most common and specious arguments on both sides of the question, and to show their more or less unsatisfactory premises and inconclusive nature; to oppugn, for example, by suggesting such considerations as the theory of atavism, the popular argument drawn from the extensive diversities in feature and complexion frequently observable within the limits of a single family. But having no such expectation, I judge it to be in better taste to avoid entering on facts and arguments more familiar probably to the reader than to myself. No student of ethnology can be unaware of the advances towards general acceptation made of late years, under the auspices of many eminent philologists, by the doctrine of Buffon and Prichard, viz.: "*that the diversities of physical aspect among mankind are wholly due to physical and moral agencies, operating in great part within cognizable periods, on the descendants of one original stock:* nor can he be ignorant that the opposite opinion is still stoutly maintained by a numerous body of *savans,* numbering many highly respectable names; and moreover that any approach to a settlement of the question would have a most important bearing upon many other subjects both theoretical and practical, connected with history, politics, moral and intellectual philosophy, and hygienic and medical science.

In endeavoring to furnish a little sound and trustworthy material to aid in guiding the judgment of those who seek to settle this question, I have chosen for my operations the determination of the colors of hair and eyes, because, though they may very possibly be of inferior importance as compared with the forms of the cranial bones, &c., (this idea is held by many in the ranks of both parties, and I am rather disposed to subscribe to it myself[*]) they have the advantage of being readily ascertainable by simple inspection. My esteemed friend, Dr. Daniel Wilson, in his "Archæology and Prehistoric Annals of Scotland," has given the measurements of the skulls of about 50 defunct North Britons; and I have not the least doubt that his observations on and deductions relative to those 50 crania, cost him more labor than I underwent in ascertaining the complexional marks of 5000 living Scotchmen.

My first observations were of little or no value to me, having been classified on an imperfect and objectionable system. That which I finally adopted, recommended itself principally by its convenience, as it generally enabled me to locate an individual in his proper class and division on a very cursory inspection.

I now acknowledge but three classes of eyes,—Light, Intermediate or Neutral, and Dark. To the first class are assigned all blue, bluish grey and light grey eyes (cærulei, cinereo-cærulescentes, cæsii).

To the third, what are called black eyes, with most of those called brown or hazel.

To the second division remain dark grey, brownish grey, very light brown, light hazel or yellow, dark green, with all those of whose color I remain uncertain after an ordinarily close inspection.

I suspect that the most satisfactory arrangement of the colors of hair would be somewhat as follows:

Red,	graduating through various shades of	auburn and red brown	into black.
Yellow	ditto	yellow-brown	
Flaxen	ditto	dull brown	

[*] Mr. Joseph Lister, in his recent investigation of the structure of the iris, found no appreciable difference between the light and the dark-colored iris. I am disposed to think its color a less permanent and trustworthy character than that of the hair, whose importance however is liable to certain *a priori* objections, which will be partly indicated in the text.

Certainly any one of these colors may be so dark as to appear black, but whether true coal-black, the black of negroes, gypsies, &c., be not a distinct color, I cannot say. I should much like to know whether the hair in newly-born negro children is perfectly black.

Far the sake of convenience I subdivide each of my three classes of eyes into six, marked respectively R (red), F (fair), B (brown), D (dark), N (black, noir, niger), and G (grey, bald, &c.).

Class R includes all shades which approach more nearly to red than to brown, yellow or flaxen.

Class F includes flaxen, yellow, golden, some of the lightest shades of brown, and some light auburns in which the red shade is not very conspicuous.

Class B includes numerous shades of brown, answering nearly, I believe, to the French "chatain-clair" and "chatain," but perhaps rather less extensive on the dark side.

Class D corresponds nearly with the French "brun" and "brun foncé," and includes the remaining shades of brown up to

Class N, which includes not only the jet black, which has retained the same color at least from childhood, and is generally extremely coarse and hard, but also that very intense brown which occurs in people who in childhood have had dark brown hair, but which in the adult cannot be distinguished from coal-black except in a very good light. Some cases of intense red certainly find their place here.

Class G I make use of only in determining the true proportion of light to dark eyes. I have omitted it in my tables, to save room. Whether because dark hair readily turns grey, or appears to do so from the stronger contrast, or that an over-large proportion of dark-eyed persons attain old age (which those who, erroneously I think, confound the xanthous temperament with the scrofulous diathesis may perhaps incline to believe)—which of these may be the cause I cannot say: but I almost always find the column 3 G comparatively more populous than 1 G.

I take no notice of those who have not apparently quite overpassed the period of puberty, as the color of the hair gradually darkens up to that time, and in many instances even after it. This fact, and the influence exerted by ill-health on the depth of the hue, furnish *a priori* arguments against the importance of it as a characteristic.

I have reduced my results into percentages, for the sake of facilitating comparison. And at the end of each line in the tables is a column headed INDEX, which shows by an increasing cipher the tendency to melanosity, the predominence of dark over red and fair hair. This cipher I obtain by subtracting the Red and Fair columns from the Dark + twice the Black column

$$D + 2N - R - F = \text{Index}$$

Brown hair is thus regarded as neutral, though most of the persons placed in B are fair-skinned, and approach more nearly in aspect to the xanthous than the melanous variety.

When unable to decide in which of two columns, (ex. gr. B and D) an individual ought to be inscribed, I divide him between the two, by a Solomonian judgment, and set down $\frac{1}{2}$ or .5 in each of them.

It is obvious that as no other person might exactly agree with me as to where the dividing lines ought to be drawn, I must rely for materials wholly on myself. I have however great pleasure in acknowledging myself indebted, for encouragement and assistance in various ways, to many friends, and particularly to Dr. Daniel Wilson, to Sheriff Robertson and Mr. G. Petrie of Kirkwall, and to Dr. Thomas Anderson of Edinburgh.

In carrying out my observations I have been hampered by the want of time and means incidental to most young physicians, but have nevertheless contrived to visit most of the districts and counties of Scotland, with some parts of England, and to tabulate a large number of observations, I believe about 25,000.

Herewith I present a summary of my results, embracing Scotland, with a few districts of England added for the sake of comparison. As they have been collected without partiality, and simply by keeping my eyes open, I can claim for them the merit of tolerable accuracy so far as they go. For the views expressed in the Notes and Supplementary Chapter, in which there is more room for ignorance and error, I can claim no such authority, but leave them to the candour and indulgence of my readers.

Should this little monograph attract any share of the attention of the ethnological public, I may be encouraged to proceed with my iuvestigations, not only in Great Britain and Ireland, but in the other countries whose population is ascribed principally to the Great Celtic and Teutonic stocks; and thereafter to proceed still further afield.

TABLE I.—LOTHIAN AND THE BORDER.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Neutral	Eyes, Dark. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Dark.	Index.
Leith, Musselburgh, Dalkeith and Portobello	200	2.5	20.	38.	12.	.5		1.5	.5	2.0	5.0	1.0		.5	.5	3.0	11.	2.0		
Dunbar . . .	150	5.3	16.	40.	12.7				.7	3.3	5.3				.7	7.3	7.3	1.3		
Midlothian — Farmers, shepherds, hinds .	300	6.0	26.	29.3	12.3	.3	73.5	.3	1.	5.3	5.0	.3	10.5	.3	.7	4.3	7.7	1.	16.	—6.1
Lothian—Total . .	650	4.8	21.8	34.5	12.3	.3	72.0	.6	.8	3.8	5.1	.5	11.0	.3	.6	4.6	8.6	1.4	16.9	1.5
Fisherfolk of Newhaven, Fisherrow & St. Monance	176	3.4	22.1	28.5	8.0	1.7	64.8	1.1	1.7	3.4	4.		12.0	.6	2.8	7.4	15 3		23.1	—1
Ditto Buckhaven . .	67	3.0	13.4	37.3	13.4	1.5		1 5	1.5	3.0	1 5				3.0	.9	11.9			
BORDER COUNTRY.																				
Kelso 50, Jedburgh 100, Hawick 130, Langholm 50 Towns . . .	330	5.4	17.6	27.8	11.5	.3	62.2	.3	3.0	7.0	5.4		15.8	.6	1.5	6.6	11.8	.9	22.	2.7
Teviotdale, Ewesdale, Eskdale, Gretna, Lockerbie, Lochmaben—rural population .	200	4.0	16.5	37	9.0	1.5	66.9	1.5	1.0	9.0	3.0		14.5	.5	1.0	6.0	9·5	.5	18.6	1.0
Selkirk and Darnich 100, Vales of Ettrick, Yarrow & Moffatdale 100	200	5.0	18.	41.5	12 5		75.7		1.5	5.0	2.5		9.7	.5	1.0	4.5	7.0	1.0	14.6	—2.0
Border—total . .	730	5.0	17.4	34.1	11.1	·5	67.	.5	2.0	7.0	4.0		13.9	.5	1.2	5.9	9.9	.8	19.1	1.0
Galashiels, Melrose, towns	100	4.0	13	29	13.	1.0		2.0	2.0	2.0	6.0			1.0		8.0	18.	1.0		
Moffat, village . .	50	4.0	16.	36.	8.				2.0	4.0	2.0			4.0		8.0	12.	4.0		
Leadhills, Wanlockhead, mining villages . .	50	6.0	18.	38.	16.					6.0	2.0					8.0	6.0			

NOTES TO TABLE I.

The Lothian peasantry seem generally tall, large and muscular, —their heads are broader, their figures and features rounder, and their cheekbones less prominent, than those of their western and northern countrymen. Their complexion is usually very fair, eyes blue or light grey, and hair varying from light red and flaxen-yellow through divers shades of brown. Hazel eyes are not rare. The overhanging penthouse brows, which are common among the Scottish Celts, are less so here, the eyes being less sunken: the nose is generally straightish, and rather short than long. Foreheads and chins rounded. This description applies tolerably well to the inhabitants of the Border districts on the opposite page. But among these there are perhaps more local variations. I think the Selkirk people may still claim the character they bore in the days of Falkirk and Floddenfield, as remarkable for stature and comeliness, and for fairness of complexion.

I have read somewhere that the Galwegian language lingered in Annandale five or six centuries ago. But the local names in that district, as in those further east, are mostly Teutonic, and the Annandalians seem to resemble in person the folk of Eskdale and Teviotdale, not them of Upper Nithsdale and Galloway.

Galashiels, a thriving manufacturing town, contains a population apparently recruited from several quarters.

Leadhills and Wanlockhead are mining villages, seated among bleak and rainy mountains, considerably more than 1000 feet above the level of the sea. Their inhabitants are remarkable for their intelligence, and for their patient and laborious poverty.

Of the fisherfolk of the shores of the Frith of Forth I will speak at a future opportunity. I doubt the common opinion, that they are the descendants of a colony of Easterlings, and therefore *ab origine* distinct from their unamphibious countrymen. If this be true of any among them, it is so of them of Buckhaven, the arrival of whose Netherlandish ancestors is circumstantially related in the Statistical account of the Parish of Wemyss.

TABLE II.—EDINBURGH.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn.	Dark	Nig	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Neutral Eyes.	Eyes, Dark. Red.	Fair.	Brn.	Dark	Nig.	Dark Eyes.	Index.
Princes Street, upper and middle classes . .	500	4.6	13.2	30.2	7.4	1.6	57.3	.6	1.6	4.6	5.8	.8	12.7	.6	.4	7.4	16.	5.2	29.9	
Mound, Bank Street, &c. mixed with countryfolk	500	6.0	14.2	29.6	12.2	1.8	62.8	.8	1.2	6 2	4.6	.8	13.4	.8	.6	5.8	10.4	5.0	23.7	
South Bridge, middle and lower class . .	500	5.0	12.4	27	11.2	1.6	56.4	.4	2.0	6.2	5.6	.6	14.2	1.4	2.0	6.2	14.8	3.6	29.4	
Back Streets, lower classes of Scotch . . .	500	4.6	14.6	26.	11.	.8	56.7	1.2	2.0	6.2	4.8	.8	15.1	.2	1.4	6 6	15.0	4.6	28 2	
General average . .	2000	5.0	13.6	28.2	10.5	1.4	58.3	.8	1.7	5.8	5.2	.7	13.8	.7	1.1	6.5	14.1	4.6	27 8	20 3
High Street, Canongate, &c., Scotch and Irish .	500	4.4	11.	28.	13 6	3.0	58.8	.6	1.0	4.4	4 4	1.4	12.2	.4	1 2	8.0	12.4	5.3	28.8	31.2
Cowgate, mostly Irish .	500	4.6	10.6	28.	20.0		63.8	.6	.2	5.4	7.4		13 6	1.6	.8	3.4	16.8		22.6	36.6?
Ditto, purely Irish .	300	5.7	9.7	30.3	13.3	2.7	61.0	.3	1.3	5.0	6.7	1.7	15	.3	.3	3.3	12.7	6.7	24	37.3
Mound, &c. Scotch, some countryfolk . .	500	5.4	17.	25.2	12.8		63.4	.2	.8	6.0	7.2		14 2	.4	.8	5.4	18.8		25.4	
Applicants at Dispensary, Scotch and Irish .	100	3.0	12.	1 8	25.		58.0		1.0	4.0	8.0		15.0			2.0	27.0		27.0	

NOTES ON TABLE II.

It will be perceived that some of these observations were made before I had begun to attempt the discrimination of black from dark brown hair.

A great part of the population of Edinburgh is of undeniably Celtic origin. The lower classes especially have, time out mind, been recruited largely from the Highlands, which supplied chairmen, porters, and cawdies to Edinburgh, as Ireland did to Bath. Celtic patronymics are very common. Irishmen form the bulk of the population in the Cowgate, and swarm also in the Canongate, &c. Except in those localities, I have endeavored to avoid noticing them.

Black hair, and black or dark brown eyes, are so common in Edinburgh as to strike with surprise a stranger from the south. But every variety of Scottish physiognomy may of course be studied here.

So far as I can ascertain, whether by personal inquiry or otherwise, the Irish population of Edinburgh is recruited mainly from Ulster and Connaught, and particularly from the counties of Monaghan, Cavan, Leitrim, and Mayo. While attending professionally to the poor of the Cowgate, I became convinced that these Irish differed much less, as to the forms of their crania and features, from the lower classes of the Scotch, than is generally supposed. This is explicable by the mainly Celtic origin of the latter.

As a rule, the malar bones in these Irish are less developed *laterally* than in the Scotch, and the features altogether are less *prononces*. The eyes are very frequently dark grey, with dark lashes, whence the large number set down as "neutral." Black hair is particularly common.

TABLE III.—GALLOWAY, &c.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Neuter	Eyes. Dark. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Dark.	Index.
Town of Ayr, market-day, half countryfolk .	500	2.6	16	33.6	16	2.2	71.7	.6	.8	3.6	5.2	.6	10.4		.8	3.0	12,4	2.6	17.9	23.6
Maybole and Cumnock, towns; Dalmellington, Patna, Kirkmichael, villages, &c. . .	250	3.6	14.4	36.8	14.	2.0			.4	4.8	4.0			.4	.8	4.0	12.4	2.4		
Sanquhar, Kells, Dalry, Carsphairn, parishes .	200	1.5	11.5	34.	17.	1.5		1.5	.5	3.5	5.5	.5		1.5	1.0	5.0	12.	3.5		
The last, with Castle Douglas . . .	250	2.8	12.4	33.6	16.4	1.6		1.2	.8	3.6	5.2	.4		1.2	1.2	6.0	10.8	2.8		
Galloway and Carrick, total	1000	2.9	14.7	34.4	15.6	2.0	72.9	.6	.7	3 9	4.9	.4	10.6	.4	.9	4.0	12.	2.6	16.5	22.3
Town of Dumfries . .	200	3.0	14.	30.5	13.	1.0	61.2	1.0	1.0	7.5	4.5	1.0	15		.5	9.0	13.	1.0	23.7	17.

NOTES ON TABLE III.

I regret having penetrated so little among the Galwegian hills. I found the peasantry there a very fine athletic race, equalling or perhaps exceeding in stature the Lothian and Border men, but rather bony than muscular. The prevailing cast of features was elongated, the face forming a long narrow oval, or sometimes, from the narrowness of the chin and prominence of the cheek-bones, a kind of pentagon; the nose long, aquiline or of sinuous outline; the eyes grey or blue, the hair brown, often of a dark shade. The people of Ayr differ little from the Galwegians; but there, more frequently than in Galloway, I recognised a physiognomy and complexion closely resembling that of the southern Irish. The eyes, if not blue or grey, are black; the hair often dark, and even jet black, rarely red, but often of a beautiful bright yellow.

Sanquhar, in Upper Nithsdale, was formerly possessed by the Galwegian sept of the MacGowans, from whom it passed to the Crichtons.

About Dumfries and Castledouglas the names, and in my opinion, the complexions and features, bespeak a mixed population of Galwegians and Teutonic Borderers.

Is it not remarkable, that while most of the Celtic dialects, viz.,—the Erse, the Gaelic, the Manx, the Welsh, the Breton, have displayed a remarkable tenacity of life, the Cumbrian, the Galwegian, and the Cornish have successively and almost unnoticed yielded up their existence, and left scarce a relic behind?

TABLE IV.—FIFE, ANGUS, &c.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Neuter	Eyes Dark. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Dark.	Index.
Kirkaldy, town	300	6.3	17.	31.7	13	1.0	67.3	1-0	1.3	5.0	3.7	.7	12.1	1.7	.7	4.0	11.0	2.0	20.5	8.1
Pathhead, Dysart, Wemyss, Methill, Leven, Largo Colinsburgh, &c., villages	300	7.0	16.	31.	11.3		65.2	.3	2.3	5.7	3.7	3.	12.	1.3	1.3	4.7	11.7	3.7	22.8	6.5
Easter Fife, (Anster, Pittenweem, Elie, St. Mon)	200	3.0	16.5	34	9.0	1.0	64.0	.5	1.5	5.5	5.0	.5	13.2	1.5	1.0	7.0	11.0	3.0	22.8	10.0
Coasts of Fife, total	800	5.75	16.5	32	11.4	.6	65.5	.6	1.75	5.4	3.9	.5	12.4	1.5	1.0	5.0	11.2	2.9	22.0	7.6
Stirling, town	500	3.6	17.2	33.6	11	2.0		.6	1.0	5.6	4.2	.2		.8	.4	7.6	9.8	2.4		10.6
Perth, town	180	7.2	19.5	35.0	15.5				1.1	4.5	2.2	.5		1.7	.5	2.8	6.1	3.3		1.4
Brechin, town	100	4.0	15.	38.0	4.0	1.0				7.0	6.0					9.0	10.	6.0		
A'rbroath, town	120	6.7	20	34.2	7.5			1.7	.8	5.0	5.0					5.0	9.2	1.7		
Brechin and A'rbroath, with other places in Angus	370	5.7	16.2	37	7.0	1.1		.5	.8	4.3	5.4	.8		.8		5.7	9.2	4.0		9.4

NOTES ON TABLE IV.

Kirkaldy is a thriving and populous town; Sinclairton, or Pathhead, a manufacturing village; Dysart an ancient town, dependent on the mining and export of coal and making of salt. Leven, Wemyss, Methill, are villages of weavers; Colinsburgh and Upper Largo of peasants; Elie has a mixed population; Anstruther and Pittenweem are ancient seaport towns, formerly resorted to by the Easterlings; Lower Largo has a seafaring population; and, indeed, that element is met with in almost all the places I have mentioned—St. Monance contains fisherfolk exclusively. Arbroath has a mixed manufacturing and seafaring population: the old city of Brechin contains only the former element.

In Kirkaldy, I think the peculiarly Scotch cast of features rather prevalent. I mean squarish and narrow foreheads, prominent glabellæ, eyes rather deep in the head, broad prominent cheek-bones and narrow angular chins. Further to the east, and especially at Anstruther, Pittenweem, Arbroath, and perhaps Brechin and Dysart, another type prevails. Figure bulkier, but not taller, face rounded, or sometimes squarish, from breadth of lower jaw, which does not form an angular chin; cheek-bones not so much marked, forehead smooth and rounded, eyes not unfrequently hazel, with light eyelashes. Complexion, &c., generally light throughout this division, except, perhaps, in the old city of Brechin. Red hair particularly common at Perth, Arbroath, Kirkaldy, and Dysart. I have reason to think that I over-rated the proportion of black hair in Angus.

TABLE V.—ABERDEEN, MORAY, EASTERN HIGHLANDS.

Hair.	Num	Eyes, Light.					Eyes, Light.	Eyes intermediate or neuter.					Eyes, Neuter	Dark, Eyes.					Eyes, Dark.	Index.
		Re	Fair.	Brn.	Dark	Nig.		Red.	Fair.	Brn.	Dark	Nig.		Red.	Fair.	Brn.	Dark	Nig.		
Aberdeen, city	600	5.8	15.	34.2	11.3	.8	66.	.8	1.5	5.7	2.7	.3	11.8	.5	.5	7.3	10.3	3.2	22.2	8.8
Valleys of the Don and Ury, 200; of Lower Dee, 150	350	6.6	16.3	35.4	15.4	1.1	75.4		.6	4.6	3.7	1.1	9.7	.3	.3	5.1	7 4	1.7	14.8	
Keith and Huntley	200	4.5	12.5	31.5	18.	1.5	67.4	.5		3.0	6.5	.5	10.3	.5	.5	4.5	11.5	4.5	22,3	30.5
Moray (Forres, Elgin, and Fochabers, &c.)	210	9.0	11.9	34.2	12.9	.9	68.7		1.4	5.7	5.2		12.6		.5	6.2	10.	1.9	18.7	10.9
Moray, Banff, & Garioch total	760	6.7	14.1	34.1	15.4	1.2	71.3	.1	.7	4.5	4.8	.7	10.7	.3	.4	5.2	9.2	2.5	18.0	15.9
Braemar and Ballater, &c.	170	10.6	15.3	34.7	11.8	4.1		.6		3.5	4.1	.6				3.5	10.	12		
Blair Athol, Pitlochry, &c.	80	5.0	15.	36.2	17.5	1.2		1.2		3.7	5.0					5.0	7.5	2.5		
Dunkeld	50	4.0	10.	30.	12.			2.0		6.0	4.0	2.0			2.0	10.	14.	4.0		
Athol and Marr, total	300	8.0	14.3	34.3	13.3	2.7	69.6	1.0		4.0	4.3	.7	10.7		.3	5.0	10.	2.0	19.7	14.8
Fort Augustus, &c. 80; Glenmoriston, &c. 70	150	5.3	18.7	3 5	16.7	2 7	76.5	.7	7	4.7	3.3	1.3	11.5	.7	.7	2.7	7.3	.7	12.0	9.9

NOTES TO TABLE V.

The population of Aberdeen is mixed, like that of all other great cities, and Celtic patronymics are common among the lower classes. In approaching Aberdeen from the side of Inverness, I was struck with the breadth of the foreheads and roundness of the faces in many of the inhabitants, but no such idea had occurred to me when I had visited Aberdeen on my return from Orkney and Caithness. The Aberdonians, are, I believe, noted for large heads. Such of the peasantry as I saw were mostly stout-built men, not being tall, but broad and burly. Fair complexions and light eyes were almost universal; but hair of a darkish brown was not seldom conjoined. Flaxen more common than yellow hair—red also frequent.

One meets with no sudden transition from Lowland to Highland forms and features in journeying up Deeside. At Ballater and at Castletown, Lowland patronymics are common; *e. g.*—Geddes, Eggo, Forsyth, Wilson. The people of Marr and Athol, though differing among themselves, are both yet more different from the Western Highlanders, whom they surpass in bulk and in fairness of complexion. The Athol men are said to be taller than those of Marr: red hair is particularly frequent among the latter. Strongly marked aquiline noses are common in both, but I think they are the exception rather than the rule.

Keith and Huntley are small towns situated in a remarkably bleak and elevated country. Celtic patronymics did not seem common there, and the prevalence of dark complexions and hair certainly puzzled me. I thought the people less broad and round in figure and feature than the Aberdonians.

The people of Moray differ from their Highland neighbours in aspect, as well as in family names. This fact countenances the statement of the extirpation of the ancient Celtic Moravians by Malcolm II. As to the Flemish origin of the new colonists, I can say nothing *pro* or *con*.

TABLE VI.—WEST HIGHLANDS AND INVERNESS.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn	Dark	Nig.	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Neuter	Eyes Dark. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Dark.	Index.
Doune and Callander	100	3.0	12.	38.	21.	2.0	77.7			2.0	3.0	1.0	5.6		1.0	3.0	11.	3.0	16.7	31
Arroquhar, Inverary, Cladich, Dalmally, &c.	240	4.1	10	36.6	20.	2.1	72.5		.8	3.0	5.0	.4	10			1.2	12.5	4.1	17.5	35.8
Teyndrum, Glencoe, Ballahulish	80	6.2	16.2	33.7	16.2	3.7				2.5	5.0	2.5				1.2	8.7	3.7		
Fort William, town	250	2.4	12.	36.	20.8	3.6	72.3	.8	1.6	4.0	2.4	.8	9.7		.4	.4	8.0	3.2	18	29.2
Other parts of Western Highlands	120	5.8	14.2	39.3	16.7	.8			.8	3.3	2.5	.8				5.8	6.7	3.3		
Glenshiel, Kintail, Lochalsh	100	3.0	16.0	30.	22.	3.0	75.2			2.0	5.0	3.0	9.6	1.0	1.0	2.0	9.0	3.0	15.2	33.0
Western Highlands, total	890	3.8	12.4	35.5	19.7	2.5	75.3	.2	.8	3.0	3.7	1.1	8.1	.1	.3	2.9	9.4	3.4	16.6	29.2
Inverness, town	150	7.3	8.7	28.	20.7			2.0	.7	3.3	4.7	1.3				8.0	10.7	4.7		
Nairn, town	80	2.5	15.	48.7	15.0				1.2	5.0	5.0	1.2		1.2	1.2	1.2	8.7			
Beauly, village, the Aird, Muir of Ord (market), Strathglass, &c.	170	3.5	14.3	35.9	18.8	1.8		1.2	1.2	6.5	3.5	2.9				1.2	8.8	.6		
Inverness district, total	400	4.7	12.2	35.5	18.7	.7	71.9	1.2	1.0	5.0	4.2	2.0	13.3	.2	.2	3.7	9.5	2.0	14.8	22.3

NOTES ON TABLE VI.

Judging by the evidence of local names, of patronymics, of language and of physical aspect, I believe myself to have crossed the dividing line between Highlanders and Lowlanders, (i.e., between Celts comparatively pure-blooded, and the same more or less extensively crossed with Teutonic blood,) at Wick, Nairn, Ballater, Dunkeld, and Doune. All these places, except the first and perhaps the last, I place just *within* the Highland boundary.

To the greater part of the people to the west of these points, I believe the description given by Dr. Prichard in the third volume of his Researches to be generally applicable. To his remarks, and to some in the concluding portion of this essay, I beg leave to refer my readers, if any of them have borne with me thus far.

The Glenmoriston folk, although mostly Grants, and therefore, according to Mr. Skene and others, descendants of the Siol Alpine, appeared to me to differ much from most other Highlanders in their broad and burly forms, and fair smooth comely countenances.

I regret that I was not able to pursue my investigations in Ross and Sutherland. The Macraas of Lochalsh, I found to be taller in stature than the south-western Highlanders, whom in other respects they seemed to resemble a good deal.

Nairn is still a boundary town, as it was in the days of King James, when the folk at the t'ae end o'the toun could na understand the folk at the tither. Highland features seemed here to wear Lowland complexions.

Arroquhar was formerly possessed by the MacFarlanes. At Inverary there is an admixture of people of Lowland descent, probably from the west of Scotland. Dalmally is in the heart of the Campbells' country: I believe the old name of Macgregor is quite extinct in that neighbourhood.

Doune and Callander lie in the Lowland vale of the Teith, within sight of Stirling castle. Yet the language of Callander is Gaelic to this day, and their neighbours of Doune seem to resemble its people in person.

The small town of Fort William and the neighbouring Glen Nevis, are purely Highland, most of the inhabitants being Camerons.

TABLE VII.—THE ISLES.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn.	Dark	Nig	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Neutral Eyes.	Eyes, Dark. Red.	Fair.	Brn.	Dark	Nig.	Dark Eyes.	Index.
Wick, town . . .	300	5.0	14.	30.6	12.		61.9	1.3	1.6	7.6	5 3		15.8	.6	1 0	6 6	14.3		22.3	
Lerwick, town . .	179	5.0	24.	31.6	11.7		74.7	1.7	1.1	1.7	2.2		6.5	1.1	1.1	3.3	12.2		18.8	
Scalloway, Sound, &c. .	78		16.6	38.4	14.1		66.6			2 6	7.7		10.			3.8	16.6		23.3	
Shetland, total . .	257	3.5	21.8	35.8	12.4		72.3	1.2	.8	1.9	3.9		7.3	.8	.8	3.5	13.6		20.3	
Kirkwall, town . .	400	3.0	16.2	37.5	13 5		69.2	.5	1.7	5.2	6.7		14.3	.5	.5	3.2	11.2		16.5	
Stromness, Hoy, Haray, Stennis, &c. . .	168	4.7	13.1	41.7	15.5		75 3		1.2	4.1	6.5		11.8	.6	.6	4.7	5.9		12.8	
Orkney, total . .	568	3.5	15.3	38.7	11.1		71.0	.4	1.6	4.9	6 7		13 6	.5	.5	3 7	9.7		15.4	
Orkney and Shetland .	825	3.5	17.4	37.8	13.5		71.4	.6	1.3	4.0	5.8		11.6	.6	.6	3 6	10.9		17.	
Strath, Sconser, Broadford, (Skye) . .	145	4.1	16.5	38 6	13.1	2.1	75.6	.7		1.4	5.5	.7	7.7	.7		4.8	9.0	2.7	16.7	16.5

NOTES ON TABLE VII.

Dr. Edmonston says of the Shetlanders, "they are not remarkable for size or muscular strength:" the Rev. John Brydone, of Aithsting, that "they are of middle stature and well-proportioned having brown or yellow hair; their features are rather small than otherwise, of an agreeable expression, and without that harshness which is characteristic of the Anglo-Saxon descent." For Anglo-Saxon, I would read Celto-Saxon. The Shetlanders come nearer to the English than to the Scotch in figure and features, and even in the colour of their hair, which is rarely either black or violently red, and most commonly of a brownish yellow. Eyes more often grey than blue, but not unfrequently brown. The people of Coningsburgh are said to be darker than those of Lerwick and Scalloway, and less mild and peaceably disposed; these facts are currently attributed to their descent from the crew of a Spanish vessel, wrecked there in 1588.

M. Kombst, in his ethnographic map of Britain, gives the Orkneys a strong shade of Celtic green, I know not why. The history of Kirkwall, and the family names there, testify to much immigration from Scotland into that city; but the Orcadians in general so much resemble the Shetlanders, that if the latter be pretty purely Scandinavian, I think the bulk of the former must be so too. The angular bony chin and cheek-bones, and prominent glabella, are perhaps as rare out of Kirkwall as they are in Shetland. Sometimes the malar bones are broad and rounded, and the face flattish, and Mr. Petrie of Kirkwall told me this was particularly noticeable in the pure-blooded Orcadians of North Ronaldsha.

Buchanan and other old writers speak of the northern Islanders as remarkably tall in stature. Their descendants are not so, though I think they may retain the praise for comeliness which was formerly bestowed upon them.

I found them of Wick, a tall, robust, and handsome people, intermediate in features and complexion between the Orcadians and Highlanders, or rather perhaps more nearly resembling the former. Some shepherds from Sutherland were readily distinguishable among them. Hazel eyes common.

The people of Skye I consider to be a mixed breed, in whom Celtic blood predominates. I regret not having seen more of them.

TABLE VIII.—GENERAL SUMMARY.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Neutral	Eyes, Dark. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Dark.	Index.
Lothian, rural	300	6.0	26.	29.3	12.3	.3	73.5	.3	1.0	5.3	5.0	.3	10.5	.3	.7	4.3	7.7	1 0	16.	—6.1
Fisherfolk	276	3.4	22.1	28.5	8.	1.7	64.8	1.1	1.7	3.4	4.		12.	.6	2.8	7.4	15 3		23.1	—1.0
North Cumberland, rural	400	4.7	20.7	36.2	12.7	.2	76.	.2	2.0	4.7	3.5		9.6	.2	.7	4.2	8.	1.0	14.4	—0.9
Scottish Border	730	5.0	17.4	34.1	11.1	.5	67.	.5	2.	7.	4.		13.9	.5	1.2	5.9	9.9	.8	19.1	1.0
Town of Perth (?)	180	7.2	19.5	35.	15.5		76.9		1 1	4.5	2.2	.5	8.3	1.7	.5	2.8	6.1	3.3	14.8	1.4
Lothian, total	650	4.8	21.8	34.5	12.3	.3	72.	.6	.8	3.8	5.1	.5	11.	.3	.6	4.6	8.6	1.4	16.9	1.5
Kendal and Lancaster	600	4.8	16.5	35.	7.3	.2	64.3	.3	1.5	7.5	5.5	.3	14.6	.3	.3	6.3	11.5	2.5	21.1	6.6
Fife	800	5.75	16.5	32.	11.4	.6	65.5	.6	1.75	5.4	3.9	.5	13.4	1.5	1.0	5.0	11 4	2.7	22.	7 6
Aberdeen, city	600	5.8	15.	34.2	11.3	.8	66.	.8	1.5	5.7	2.7	.3	11.8	.5	.5	7.3	10.3	3.2	22.2	8.[illegible]
Angus	370	5.7	16.2	37.	7.	1.1	68.5	.5	.8	4.3	5.4	.8	11.8	.8		5.7	9·2	4.0	19.7	9.4
Orkney and Shetland (?)	825	3.5	17.4	37.8	13 5		71.4	.6	1.3	4.	5.8		11.6	.6	.6	3.6	10.9		17	10.?
Stirling, town	500	3.6	17.2	33.6	11.	2.	66.	.6	1.0	5.6	4.2	.2	12.3	.8	.4	7.6	9.8	2.4	21.7	10.6
Bradford, Yorkshire	1000	4·4	12.8	28.3	8.1	.6	54.	1.0	2.0	8.6	5.2	.5	17.2	.9	1.9	8.4	14.6	2.7	28.8	12.5
Wick, town (?)	300	5	14	30.6	12.0		61.9	1.3	1.6	7.6	15.3		15.8	.6	1.0	6.6	14.3		22.3	13.?

TABLE IX.—GENERAL SUMMARY.

Hair.	Num	Eyes, Light. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Light.	Eyes intermediate or neuter. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Neuter	Dark, Eyes. Red.	Fair.	Brn.	Dark	Nig.	Eyes, Dark.	Index.
Athol and Marr	300	8 0	14.3	34.3	13 3	2.7	69.4	1.0		4 0	4.3	.7	10.7		.3	5.0	10.	2.0	19.7	14.8
North Wilts	860	1.9	12.3	33.7	8.4	.3	56.7	.1	1.3	13.4	5.4	.2	20.7	.2	.3	7.8	13.8	1.0	22.6	14.8
West Lincolnshire and South Notts	1450	2.6	13 3	36.5	10.8	.6	63 4	.7	1.1	5 7	5.2	.2	13.2	.3	1 1	6.8	13.	2.1	23.4	15.7
Moray, &c.	760	6 7	14.1	34.1	15.4	1 2	71.3	.1	.7	4.5	4.8	.7	10.7	.3	.4	5.2	9.2	2.5	18.	15.9
Isle of Skye	145	4 1	16.5	38.6	13.1	2 1	75.6	.7		1.4	5.5	.7	7.7	.7		4.8	9.0	2.7	16 7	16.5
Dumfries, town	200	3.0	14	30.5	13.	1.0	61.2	1.0	1.0	7.5	4.5	1.0	15		.5	9.0	13.	1.0	23.7	17 0
Edinburgh, city	2000	5.0	13.6	28.2	10.5	1.4	58·3	.8	1.7	5 8	5.2	.7	13 8	.7	1.1	6.5	14.1	4.6	27.8	20.3
Inverness, town and district	400	4 7	12.2	35.5	18.7	.7	71.9	1 2	1.0	5.	4.2	2.0	13.3	.2	.2	3.7	9.5	.2	14.8	22.3
Galloway, Carrick, &c.	1000	2.9	14.7	34.4	15.6	2 0	72.9	.6	7	3.9	4.9	.4	10.6	.	.9	4.0	12.	2.6	16.5	22.3
Worcestershire, west and central, rural	700	2.7	13.1	34 8	19.	.2	70.2	.3	.3	3.3	4.4	.3	8.3	. 6	.7	3.9	14.3	2 0	21.5	25.2
Oxford, city	400	4 7	7.2	35 3	12.2	.5	60.9	.6	1.4	5.7	5.5		13.8	.2	.6	6.6	17 1	2 1	26.6	25.3
Western Highlands	890	3.8	12.4	35.5	19.7	2.5	75.3	.2	.8	3 0	3.7	1.1	8.1	.1	.3	2.9	9.4	3.4	16 6	29.2
Bewdley, town	500	3.5	7.7	34 3	12.4	.5	59.7	.2	.4	4.0	5.0	.4	9 6	.4	.9	6.6	20.5	3.2	30.7	33.0
Irish in Edinburgh	300	5 7	9.7	30.3	13.3	2 7	61	.3	1.3	5.0	6.7	1.7	15.	.3	.3	3.3	12.7	6.7	24.	37.3

SUPPLEMENTARY CHAPTER.

I shall now devote a few pages to some illustrations of my Tables, which could not conveniently be appended to them in the form of Notes. I have already quoted from Dr. Prichard* what I consider to be an accurate description of the complexion most prevalent throughout a great part of the Western Highlands. In proceeding to speak of the frequent occurrence of black hair in particular districts, he puts forward, and supports by an analogical fact observed in rabbits, the curious statement that where black hair is common, red and yellow are so too. I am disposed, on independent grounds, to agree with this to some extent. My Tables show that I did not find black hair at all confined to particular districts: it appeared to be common in all parts of the Highlands, as compared with those parts of England and the Scottish Lowlands, where the population is supposed to be pretty purely Teutonic. It is also common in the borders of Galloway. But in some districts this frequency is exaggerated. In Ayrshire, where hair of a clear bright yellow seems very common, that which is coal black is not much less so. In Kintail black hair is singularly common, but the proportion of fair hair (chiefly yellowish) is above the average. Red hair is more frequent in Marr than in any other district I have visited; and here too a coal black hue is very common. In Wiltshire both black and red locks are remarkably rare.

I am disposed to think, as before hinted, that black and red hair are not so diametrically opposed as is generally imagined.

Is it not markworthy that among the tribes of the great Tschudish or Ugrian race, some, as the Voguls, are described as preeminently red-haired; some, as the Magyars, are black-haired; some, as the Laplanders and Ostiaks, are placed by different observers sometimes in one category and sometimes in the other; while yellow hair is attributed to the Esthonians and Baltic Finns. But no Tschudish tribe, except the Mordwines, as far as I am aware, is described as assimilated in this respect to the other peoples of Northern Europe, among whom flaxen and brown in various shades are the prevailing colors.

* See page 0.

With much diffidence I put forward the following account of the other physical characters of the West Highlanders.

Complexion generally dark or sallow—at least more commonly so than in any other district I am acquainted with. Eyes generally clear light grey, passing into various shades of darkish grey; often blue; sometimes black and piercing; seldom or never hazel. Eyelashes dark. Face oval, and generally narrow in women; but in men somewhat pentagonal, from the squareness of the forehead, (which is rather narrow), the prominence of the cheek bones, and the narrowness and prominence of the chin: nose long, thin and high, but not often truly aquiline; eyebrows prominent, as though the frontal sinus were largely developed.

Men generally rather short, large-boned, and often square-shouldered, but not bulky; light, wiry and active.

At Ballahulish and at Fort William, where the race is certainly very pure, I was continually reminded of the southern Irish. Those fine, tall, straight, clean-limbed, high-bred looking fellows, whom many suppose to be typical Highlanders, and who are, perhaps, specimens of the *perfected* race, are met with now and then, but are very far from numerous.

Hebrideans.—That the Hebrideans in general are much mixed with the descendants of the Norsemen is beyond all doubt. Not to speak of its probability on historical grounds, it seems that the names of places and of the features of the country are almost as often Norse as Celtic. And Professor Traill informs me, that he found many Icelandic words in the Gaelic dialect current in Mull. Mr. Skene casts aside the traditional opinion, that the MacLeods are of Scandinavian descent, but I cannot help thinking that he does so on insufficient grounds.

In the eastern parts of the Isle of Skye, accordingly, I found a people much resembling the West Highlanders, yet notably differing from them in several points, which might probably indicate Scandinavian admixture. These were, the general roundness of their figures and features, the commonly lightish hue of their lank abundant hair, the shortness of their noses, and less prominence of their brows.

I am assured by a gentleman who has made some observations on the subject, that the Highlanders further to the west and north differ much from the mainland men. He thinks them shorter than the Ross-shire Highlanders, less raw-boned, fairer in complexion, but not light-haired. Most ethnologists are aware that the natives of the northern extremity, or Butt of the Lewis, are said to be quite Norwegian in appearance.

FISHERFOLK OF THE FIRTH OF FORTH.—These form, as is generally known, separate communities, the members of which rarely intermarry with their less amphibious neighbours. Their costume, especially that of the women, with their voluminous striped petticoats, their manners and customs, are peculiar when compared with those of the neighbours aforesaid, and much resemble those of the Pecheurs of Boulogne, and other places on the continental coast. In person they, at least the women, are tall, large, and comely, their complexions are fair, their eyes generally blue or hazel, and hair of shades varying from yellow to deep chesnut. So far there is nothing to contradict their descent from Easterling colonists, according to a current opinion, traditional or conjectural. But their crania appeared to me to be generally of the dolicho-Kephalic type, and their faces oval, with features corresponding: I did not think, however, that the cheek-bones were often prominent, nor yet the supraorbital ridges. Their family names are similar to those of the adjoining provinces of Fife and Lothian, ex. gr. Caird, Gilchrist, Duncan, Slight, Wilson, Gibson, Jameson, Banks, Miller, Lees, Reid, Ramsay, Johnston, Liston, and Linton. Three of these names, it may be noted, are Celtic, and some of the others belong to families undoubtedly Lodonian. I thought I found broader heads and faces among the Buckhaven people, but as I had gone thither in the full expectation of finding them, I am rather unwilling to trust to my impressions.

In my humble opinion, the results of my observations, as tabulated on the preceding pages, may be of service, in conjunction with collateral facts, in proving that the present diversities of complexion, between the natives of different parts of Scotland, cannot be ascribed wholly or even chiefly to the influence of climate and such-like local agencies. If a cold and damp climate favours the development of the xanthous at the expense of the melanous variety, why are the people of Lothian fairer than those of Upper Argyleshire and Kintail, and even of Orkney and Wick. Why are they of Moray and Deeside not so dark as those of Keith and Huntley, who dwell among the bleak shelterless hills

of Upper Banffshire. The people of Marr* and Athol dwell at a great elevation above the sea, and remote from the mild breezes that derive geniality from the Gulf Stream. And it is true that they are fairer than most other Highlanders, but not fairer than the people of Perth, of Angus, and of Aberdeen, who dwell within sight of their mountains, but almost on the level of the sea?

If urban life has a tendency to darken the complexion, why are the citizens of Aberdeen so fair, and the townsmen of Perth, Dunbar, &c.†

If we admit that the ancient Celts and Teutons differed to a certain extent in complexion, and that this difference has not been effaced, at least not wholly so, up to the present day, we shall find these questions much less difficult, though some obscurity will remain.

I will now state what are the complexional characters I have been led to attribute to the two great ethnological sections of Britons, as at present existing.

1. CELTIC RACE.—Eyes grey or blue, passing through dark grey and dark green into brown and black. Eyelashes dark.

Hair bright red or yellow, passing through various shades of brown, generally bright and tinged with red or yellow, into dark brown and coal black.

2. TEUTONIC RACE.—Eyes blue or grey, passing through greenish grey, yellow and hazel into brown. Eyelashes light.

Hair light red, flaxen or flaxen yellow, passing through various shades of generally dull brown into a very dark hue, but not into coal black.

I think the color of the cheek in the Teuton indicates predominance of the arterial over the venous system, as compared with that in the Celt.

The prominence of the glabella and supraorbital ridges, and the narrowness and angularity of the chin, seem to me to be features of pretty constant occurrence in the Celtic districts. In the Scandinavian districts the chin is often somewhat pointed, but the lower jaw is broad and curved.

* Castleton of Braemar is about 1000 feet above the level of the sea.

† Be it observed, I by no means venture to deny any potency to these agencies; but I do suspect that philological ethnologists are apt to ascribe too much to them.

We must not forget that other races probably preceded the Celtic colonists of Britain, as Dr. D. Wilson has almost demonstrated. Can the not very unfrequent occurrence in Scotland of the oblique eye, combined with other semi-Turanian features, be traceable to the existence there of some remains of these Allophylians, perhaps of Finnic consanguinity.

To resume. The population of Lothian is undoubtedly in the main of Dano-Saxon or Teutonic origin. Perhaps too little attention is often paid to the fact of the *early and permanent* occupation of the south-east of Scotland by the Northumbrian English. Though before the time of Bede, the North British peoples had begun to recover their lost ground, and the encroaching frontier of the Northumbrians "inceperat retro fluere et sublapsa referri," so that they no longer threatened Fife and Strathearn; yet if Palgrave be correct, the Lothians and Merse were granted by Edgar to Kenneth of Scotland so late as 971, on the express stipulation that the English inhabitants should be maintained in their *language*, customs, and laws. The Northumbrians had occupied the plain country of Cumberland, (and probably therefore of Lower Eskdale, &c.) at a very early period. The Saxon reading of the celebrated Ruthwell inscription confirms this fact. King Edred, in the 10th century, possessed Teviotdale; for he cast Archbishop Wulstan into prison at Jedburgh.

On examining the map, we find that throughout a large portion of the south-east of Scotland, but in scarcely any other part of that country, the names of places are for the most part Saxon or Danish. It appears to me that this district may be tolerably well defined by a line drawn from Stirling on the Forth, through the eastern borders of Lanarkshire to the head of the Clyde, and continued thence through Dumfries to terminate somewhere on the coast of Kirkcudbrightshire.

In Fifeshire the names of places are almost without exception Celtic. Fife was never conquered *vi et armis* by the early Anglo-Saxons, but no doubt a very great though almost peaceful immigration from the south took place about the time of the so-called Saxon Conquest. This statement applies also to Angus and Aberdeen, and with some modification to "the laigh of Moray." Flemings also settled here in considerable numbers, and it is possible that the Norwegians had done so at an earlier period, though the Scottish history of that period, such as it is, gives no

account of any other than predatory incursions effected by them in the Northern Lowlands.

It is markworthy that if the Piccardach, or Fair or Southern Picts, were really distinguished by their complexion from the darker Highlanders of the north west, it is not unlikely that the present inhabitants of Fife, Angus, &c, derive their xanthous character in part from them.

Mr. Skene, if I understand him rightly, supposes the Caledonians, whom we have every reason to believe to have been ancestors of the present occupants of Athol and Marr, to have belonged to the Northern Picts. But his arguments, ingenious and learned as they are, can hardly be considered as having settled the question for ever. I may perhaps be allowed to point out that the "rutilæ comæ" of the Caledonians are still remarkably and uniformly common throughout the whole region, Highland and Lowland, from the Forth to the Don, and even to the Moray Firth, but decidedly rare throughout the highland country that stretches conterminously with it on the west.

There is yet another theory that might suggest itself to a zealous Pinkertonian, in connection with the facts just mentioned. Is it not possible, he might say, that the xanthous or rather rutilous area above defined may really have been the whole of Pictish territory, the Scotch from Ireland having gradually pushed northwards so as to expel the Picts from the whole western Highlands, or having possibly settled there to some extent in prehistoric ages. I think this theory just deserving of mention, though Mr. Skene's facts and arguments are to my mind pretty conclusive against it.

If the Orcadians and Zetlanders be not quite so fair as might beseem pure Scandinavians, something may be allowed, perhaps, for the Ugrian thralls of the early colonists, or for the relics of a primitive "Pictish" population, for the slaves dragged thither from more northern Celtic countries, and for the continual immigration, during four or five centuries past, of Scotch officials, traders, &c. Still, however, they must be mainly a Scandinavian people, and accordingly I did find them, though not so universally xanthous as they are reported, a much fairer people than the western Scotch.

In Galloway and Carrick, as in the centre of Scotland, the ethnography is rendered exceedingly complicated by the presence in numbers of at least two of the races commonly classed together as Celtic.—I mean the old Cumbrian or Strathclyde Britons, and the Irish who intruded upon and amongst them. Moreover there has been much intercourse with Ireland in modern times.

I have not visited western Galloway, nor have I seen enough of the north Welsh and of the Cumbrian folk to speak very confidently of their characteristics. But if the Cumbrian Britons may be supposed to have combined a comparatively fair complexion with crania and features of the elongated Celtic type, the Irish immigrants to have had the characters of their countrymen at the present day, the problem of the Galwegian physiognomy may not be so difficult.

It may be worth while to point out that the proportion of dark eyes in the population of Edinburgh is unusually great; in fact, that it exceeds what I have found in any other district in all Scotland, though with the exception of the neighbourhood of Glasgow, which I avoided on account of the great mixture of races in manufacturing towns, I have perambulated nearly all the more populous parts of the country. I can scarcely come to any other conclusion than that herein we have really an evidence of the effects of some agencies connected with a town life in darkening the color of the iris. It will be observed that the colors of the hair there are not different from what might have been expected, considering the large Celtic admixture present.

And now in taking leave of my Scottish readers, I must again entreat their courteous consideration, which I know will not be the less readily granted, because the author had the "misfortune" to be born on the wrong side of the Tweed.

University College, London,
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PAMPHLETS

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