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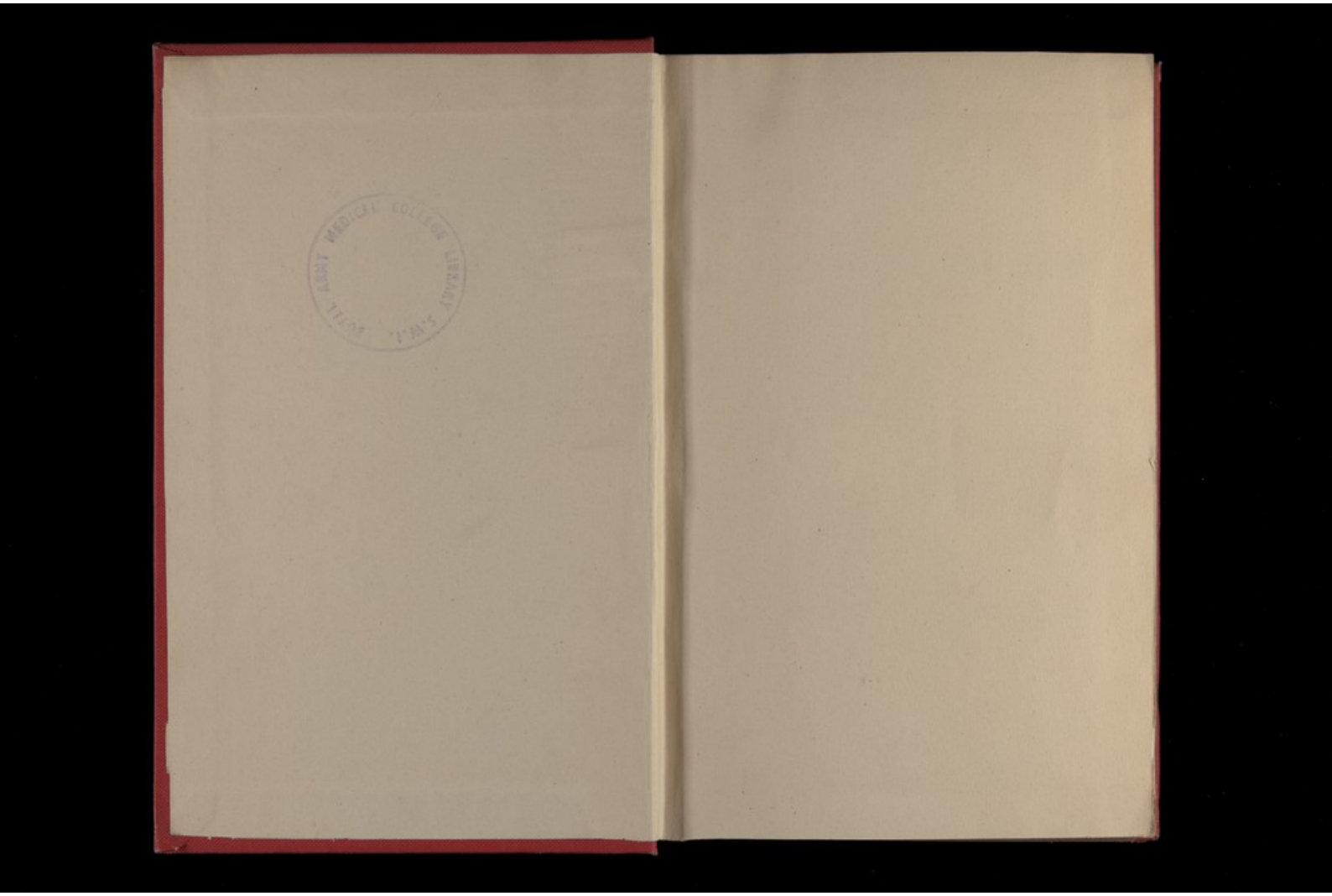

REPORT

ON THE

PROGRESS OF OPHTHALMIC SURGERY

FOR THE YEAR 1846.

BY

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REPORT

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PROGRESS OF OPHTHALMIC SURGERY,

FOR 1846.

With original Cases and Illustrations.

By WILLIAM R. WILDE, M.R.I.A.

SURGEON TO ST. MARK'S OPHTHALMIC HOSPITAL.

Introduction.—As there is no journal in Great Britain exclusively devoted to Ophthalmology, we purpose devoting a section of our periodical to this subject, at least once in every year(*a*). In this Retrospect or Report, we intend to give the cream of the foreign periodicals, particularly of those which are alone occupied with this subject, as the *Annales d'Oculistique*(*b*), and the *Journal für Chirurgie und Augenheilkunde*(*c*), besides notices of all the interesting or valuable matter which may appear either in special works on this subject, or in the current periodical literature of these kingdoms; together with original cases and observations by ourselves, or which shall be furnished to us by others.

In drawing up these Reports, we shall follow the simplest form of arrangement; beginning with the national peculiarities, as well as the congenital malformations and diseases, we shall pass on to the diseases of the eye-lids and lachrymal appendages, and proceed step by step to the deeper-seated textures and the more intense and dangerous affections of the dioptric media, and the nervous apparatus of vision. We shall notice the anatomical and physiological discoveries made in this particular branch of medicine, only so far as they have a practical influence on the treatment of disease. And lastly, this Report may be expected to contain a brief comment

(*a*) The first part of this report was drawn up and put into type for our November Number, but the extent of the Biographical Memoir, the great length of the Medical Miscellany, and the Pathological Proceedings, precluded the possibility of its insertion. It has, however, been since brought up to the latest hour.

(*b*) *Publiées par le Docteur Florent Cunier Medecin-Oculiste, &c., a* Bruxelles.

(*c*) *Herausgegeben von Dr. P. v. Walther und Dr. F. A. v. Ammon.* Berlin.

or review of such works upon Ophthalmic Surgery as are not specially reviewed in the department of the Dublin Quarterly Journal devoted to Reviews and Bibliographical Notices, and which have been published during the twelve months previously.

National Peculiarities.—During the past year we have not noticed the appearance of any special work on diseases of the eye from the British press, and our periodicals are for the same period remarkably deficient on this subject. Toward the close of the year 1845, Dr. S. Furnari published his *Voyage Medicale, dans l'Afrique Septentrionale, ou de l'Ophthalmologie consideree dans ses rapports les differentes Races*(a); a work written in a philosophical spirit, and containing a vast deal of information in a very simple and expressive form. In the commencement of his book, he defines the physical characters of the Arabs, Kabyles, and Moors, the three native races in Algeria. The Arabs, who are tall, thin, of a swarthy complexion, with oblong crania and narrow foreheads, together with light thin bones, the hair black and crisp, the face oval but compressed at the sides, the nose long and presenting an aquiline profile, have, he says, *The Orbital Cavities* larger, and the superciliary ridges more arched and prominent than the generality of mankind. Cruveilhier attributes the sunken appearance of the eye, and the prominent position of its external bony defence, in this race, to the small quantity of adipose substance with which the orbit is provided; but Larrey long since established the fact, that the orbit is more arched in the Arab than in the European. The colour of the eye in the Arab is what is generally termed black, and in the Kabyle this is even more marked. In this race, Furnari says, the tunics of the eye are thicker than usual, but the fact of the greater density of the coats of the eye in persons where the iris is very dark, was long since observed by Maitre Jean, Soemmering, and others. Some children have in early infancy very light blue eyes, which, however, darken in after life.

M. Petrequin has made the following observations on the *Colour of the Eyes* in European latitudes. Of 600 individuals of both sexes he found:

		Males.	Females.
Grey eyes,	208	134	39
Blue,	134	49	20
Light browne,	144	93	19
Brown,	134	70	45
Black,	14	6	5

The blue and grey may, however, be classed together, and then the disparity between the dark and the light eyes does not appear so great. With regard to the difference of colour among the sexes, the same author has recorded the foregoing results in 489 individuals, 352 males and 137 females, as shewn in the second and third columns: "Thus it will be seen that grey eyes predominate among males, and brown eyes among females. The grey eyes are in the sexes

(a) Paris, Bailliere. 1845.

respectively as 1 in 2·6 males, and 1 in 3·5 females; the brown eyes are, on the other hand, 1 in 3 females; 1, and only 1, in 5 males. As a practical application of these remarks, M. Petrequin shews that the old opinion of persons with brown eyes being more subject to iritis and amaurotic congestion was fallacious."(a)

We would suggest to our colleagues who have the management of large ophthalmic institutions, to register the colour of the iris in different diseases. From such a registry some very interesting, if not valuable, information would in a few years be acquired.

In all the races in the north of Africa, the ciliæ and also the hairs of the eyebrows are very long, thick, and dark, and the upper eyelid is broader from above downwards than in Europeans. This peculiarity, Furnari thinks, contributes to the production of the entropium and trichiasis so common to these races.

Since the days of the elder Soemmering, very little has been written upon the national peculiarities of the human eye, except such passing notices as appeared in the works of travellers, and the most valuable of these have been collected and arranged by Dr. Prichard, in the various editions of his splended works upon the physical history of man. Furnari has, however, added some interesting particulars to our knowledge on these subjects; his observations are as follows:—In the Kabyles and Negroes, and also in a great number of Arabs, *The Cornea* is from half a line to a line smaller in its circumference, than in the average Europeans, except the inhabitants of Spain and of Sicily, whose blood is still mixed with that of the Arab. The arcus senilis appears very early in life. In the races indigenous to Africa, the cornea is remarkably convex, yet they generally possess exquisitely minute and long sight, and very few are myopic. From this observation an interesting question arises, viz. whether the convexity of the cornea is the sole or principal cause of myopia. Either the convexity of the external tunic of the eye does not correspond with the curves of the other refracting media,—or the convexity of the cornea, does not always, and of necessity constitute *Myopia*. This latter offers the most probable solution; we do not think that short-sightedness depends *alone* upon the peculiar curve of the cornea, in proof of which it may be mentioned, that in most birds, and in several beasts of prey, where the convexity of the cornea is decidedly very great, the vision is very long; while again, in fishes, the cornea is nearly flat, and the lens globular, yet vision is in their medium perfect. Furnari conceives that short-sightedness has its seat in the retina, or is caused by some defect of the optic nerve. May it not with more likelihood be caused by some alteration in the anterior or posterior curve of the lens itself? In many instances this affection would appear to be induced; and from its being so frequently observed among men of sedentary and reading habits, as well as those engaged in delicate manipulations, requiring accurate and minute vision, and so seldom met with in the labouring and lower classes, we

(a) The London Medical Gazette, vol. II. N. S. April 10, 1846, p. 665.

are led to conclude that it is induced in a great measure by education and the particular pursuits of the individual. The Arabs, the wild children of the desert, free and uneducated, having no knowledge whatever of letters, without any profession or trade which could oblige them to apply the organ on minute objects, and having no other boundary to the vision than the distant horizon, on which with a cautious glance the eye is often bent, possess,—notwithstanding the well-marked over-convexity of their cornea,—remarkably long sight. The only persons we ever met in Africa wearing spectacles, were watchmakers, or those Jews, Copts, or Moors, who were employed as scribes, or were engaged in literary pursuits(*a*).

The Sclerotic is said, by Dr. Furnari, to present in the Arabs, in a slight degree, the yellow hue which it does in the Negro.

The Muscles of the Eye and its appendages are remarkably well developed in the northern Africans, either because they exercise the eye so much on distant objects, or because these parts are more frequently called into action to defend the organ from the intense glare and heat. They are also said to be redder than in Europeans, as has been remarked by Larrey, Rostan, and Broc. The restless activity of the eyes in this race must have struck every one who has had an opportunity of observing even a few individuals of it.

The Iris, like the cornea, is very small in the Arabs, and its aperture is said to be more contracted than in Europeans. In all orientals its colour varies in intensity, according to that of the skin and hair, so that in the Negro it is so black that the pupil can scarcely be distinguished from it. In its substance (and particularly the uvea), it is thicker than in Europeans, and is also said to be a little more convex anteriorly.

According to the observations of Furnari (but he does not state from what number of actual dissections), *The Crystalline Lens* is smaller and more convex, in fact, rounder, than in Europeans. This, if true, may, in some measure, account for the long sight possessed by these people, while at the same time their cornea are so convex.

The Choroid, in the inhabitant of Algeria, is very thick, and the pigment upon its surface is remarkably black, even in old persons; whereas, in Europeans it assumes in middle age a pale aspect, which degenerates into a yellowish hue, at old age. This intensity of colour in the visual organs of the inhabitants of a climate of such great heat, and of a light so strong and glaring, and reflected from every surrounding object, is a wise and beautiful provision. We learn that amaurosis is very scarce among the inhabitants of Algeria, and it may be owing to the greater development of colouring matter; for it has been asserted, and with some degree of truth, that, in these countries, seven out of ten persons, labouring under amaurosis and impaired vision have light-coloured eyes, and in several it is said that there is

(*a*) Since these observations were put into type we have received Mr. W. W. Cooper's work upon Near Sight, but want of space prevents our making any extract from it here. We shall refer to it again under another head.

a deficiency of pigment. From this data Furnari is drawn into some theoretical speculations, which, although we attach little weight to them, yet deserve to be mentioned. One is, that in amblyopia and amaurosis, where there is no organic lesion, it would be well to use some of those preparations of iron which might assist to restore the deficiency of the protoxide of that metal in the pigment, as we aim at increasing the quantity of iron in the blood in chlorosis. It might be interesting to experiment after this fashion on the albinos among the lower animals. *Albinism* is considered by the author we are noticing more in the light of a disease than a congenital and incurable defect. There can be little doubt that colouring matter is occasionally deposited in the eyes of albinos in after life; we have ourselves remarked instances of it, and it becomes a question whether, in such cases, remedial agents should be entirely thrown overboard, or whether we should not endeavour, by regimen and other means, to induce an effect which nature sometimes brings about. See the remarkable instances of the partial deposition of pigment, and consequent alteration in colour, in an albino family, published by Dr. Graves some years ago. Albinism is very frequent among the African Jews; but there is this remarkable peculiarity about these people, that their eyelashes, instead of being quite white, are, as as well the skin of the eyelids, covered with minute reddish spots. Dampness, and unwholesome food and air, &c., are enumerated among the causes of albinism; and it is remarkable that the Isthmus of Darien, one of the dampest countries in the world, should possess the greatest number of albinos.

Congenital Malformations.—Having thus far noticed the national peculiarities mentioned by the Author, we beg to add, under the head of congenital malformations, the following interesting case of *Microphthalmia* and *Coloboma Iridis*, which we met since the publication of the second part of our Essay on the Congenital Defects of the Organs of Sight, in September, 1845; and the accompanying wood-cut of this most interesting instance of a peculiar arrest of formation will serve to assist the description:

Mary Craig, aged 22, of stout make and healthy aspect, residing in the county of Wicklow, presents, at first sight, remarkably sunken eyes, and the vacant stare attendant on impaired vision. On examination, the left eye is found to be somewhat less than the natural size; more than a third of the cornea is covered by the upper lid

when she looks straight forward; the sclerotic is natural, but the cornea, though not smaller than usual, is irregular in form; its margin, instead of being circular, is elliptical inferiorly; its curvature, as far as can be judged by the unassisted eye, natural. The iris is of an uniform deep brown colour, and wants those peculiar marks and striæ which characterize this texture in its well-developed state. The pupil is ovoid, and occupies a place in the inferior half of the iris, its upper large extremity being about the centre, and its inferior, pointed end touching the margin of the cornea, where, indeed, there is scarcely any iris visible: it is very slightly moveable, and wants the circles usually observed around its margin. With this eye she was formerly able to distinguish large objects very plainly, but she has latterly lost much vision, and is now scarcely able to find her way with it.

The globe of the right eye is scarcely one-half the size even of the left, and the palpebral aperture, which is a very narrow ellipse, is about a third less than the left; when she looks straight forward the superior lid covers nearly one-half of the cornea, and beneath its lower margin there is a much larger portion of the tunica albuginea seen than is usual in the normal eye. The sclerotic is thin and bluish; the cornea, even in proportion to the very small globe, occupies not more than an eighth or tenth of its circumference. Like that of the left, it is irregular in figure, but its connexion with the sclerotic is sharp and well-defined, and its curvature is less convex than that of the left. The iris is brown, but lighter in colour than the left, and also deficient in striæ and circles. The pupil occupies more than one-half of its perpendicular diameter, and is more triangular than in the left. With this eye she was formerly able to thread a fine needle, but now she is only able to find her way comfortably. There is slight nistagmus of both eyes; but the lids and lachrymal appendages are normal.

The two following cases are worthy of being recorded, from their practical influence in the formation of a speedy and accurate diagnosis. We were lately sent for by Captain B., of whom we had no previous knowledge, and who was then confined to his room from what we were informed was "a severe cold and inflammation of the eye." On arriving at his hotel we found him labouring under great intolerance of light, lachrymation, and some œdema and redness of the lids of the right eye. Being a person of rather eccentric manner, he refused to give any history of his disease, or describe his own feelings and symptoms, until we had pronounced upon his case. On examination we found the entire conjunctiva highly injected, and two large vascular masses projecting from the surface of the globe; one, the lesser in size, and least apparent, protruded from under the upper lid, just beneath the situation of the lachrymal gland, it was of a deeper pink than the rest of the conjunctiva, and appeared firm and unyielding. The second and most remarkable tumour was, in its then condition, about the size of a horse-bean, placed transversely on the globe, one-third of it lying on the cornea, the other two-

thirds occupying the outer side of the sclerotic. Like that which protruded from beneath the lid, this was of a deep pink hue, and slightly lobulated on its surface, not unlike a half-ripe raspberry. A gush of scalding tears, attended with increased pain and photophobia, followed immediately on this examination. We at once pronounced them to be *Congenital Tumours* in a state of inflammation, and such they were; that which encroached on the cornea had several light-coloured hairs growing from its surface. These generally lay quiescent between the palpebral aperture, or projecting slightly over the edge of the lower lid, seldom caused any inconvenience. The largest of these, however, had two days before turned up under the superior lid, and gave rise to all the symptoms we have described. Its removal caused them to subside almost immediately. This case is interesting and instructive on account of its having been first seen during an attack of inflammation, or, more properly speaking, inflammatory irritation, and from the possibility of its being thus mistaken for a sudden morbid growth. What first awakened suspicion, the moment the lids were separated, was the fact of the tumour being covered with cuticular epithelium, which, as in cases of xeroma, gave it the appearance of being oiled or varnished, so that the tears did not flow over it and moisten all its surface, but lay upon it in detached globules. This cuticular character is peculiar to all those growths from which hair grew, which we have examined. We have since seen the eye in a quiescent state, and find our conjectures were correct.

Mr. M., with large prominent eyes and remarkably brilliant irides of a greenish-grey colour, consulted us lately for partial amaurosis. On examining the eyes at about two feet distance, the edge of each pupil appeared remarkably ragged and irregular, so as to look like a case of synechia posterior, the result of iritis, in which the attachment of the iris to the lens had been put upon the stretch by the action of belladonna. Upon a closer view the appearance turned out, however, to be the result of an irregular circle of remarkably black pigment (darker even than that which is usually found upon the uvea) which occupied the inner fifth of the circle of the iris, and was apparently raised above the surface of that membrane. It was with some difficulty that the pupillary margin (which was perfectly normal) could be distinguished at the distance of even twelve inches. The outer edge of this deposit, though most irregular, was very sharply defined. We have occasionally seen detached spots of this nature, but nothing like that which we have now described, nor is there any such case recorded by the writers that we have consulted. Either the pigmentary membrane turned round the pupillary margin and spread over the anterior surface of the iris, or the parenchymatous structure of the iris was congenitally deficient at this point, and allowed the uvea to be seen anteriorly. The circles and radiating lines were not well marked in this person's irides.

We shall reserve the consideration of several interesting cases of the congenital malformations of the iris, choroid, and the dioptric

media for the third part of our essay upon that subject, which shall appear in the Original Communications department of our periodical during the present year.

Diseases of the Eyelids and lachrymal Appendages.—The journals have not afforded much information on this head. We may, however, refer to two cases of *Enlargement of the Lachrymal Gland*, recorded by Dr. Halpin, of Cavan, in the first Number of our present series (Feb., 1846, p. 79). In one of these cases, that of a man aged 40, the disease was apparently of about two years' standing: "The eye-ball was protruded completely from the orbit, lying outside the orbital ridge of the malar bone; the cornea, which presented a healthy appearance, was turned upwards and outwards; the iris contracted moderately on the admission of light, but vision was very much impaired by the straining of the optic nerve, and the pressure of the entire globe by the tumour: the eye-lid was of a dusky, almost purple colour, irregular on its surface, and traversed in various directions by enlarged veins." Dr. Halpin having enumerated the various methods of removing this gland, says that, in order to avoid wounding the thinned and discoloured eye, he drew downwards the tumour till one-half of the eye-brow was below the level of the superciliary ridge; and then, fixing the integuments on the forehead, he made his incision in the centre of and completely through the entire length of the eye-brow. The flap being turned down, a ligature was passed through the gland, and it was dissected entire from its deep connexions. There was no hæmorrhage, and the wound healed by the first intention. The eye-ball gradually regained its natural position, and a month after the operation vision was perfectly restored. "In order," he says, "to ascertain whether tears would flow from an eye deprived of its lachrymal gland, I dipped the blunt end of a probe in Tr. Opii, and touched the conjunctiva with it; immediately the *right* eye became suffused with tears, which flowed over the cheek. At the end of thirty seconds I applied the probe a second time; in sixty seconds after this second application a drop of fluid fell from the left eye, and in thirty seconds more another; this fluid was opaque and whitish; doubtless this appearance was caused by the tincture: the conjunctiva remained red for a considerable time after the application of the tincture. He did not experience any feeling of unusual dryness of the eye-ball since the operation." A year after the operation, Dr. H. informs us: "The sight is as good as ever; no complaint of dryness; but lachrymation is scanty, and excited with difficulty." The tumour, which is now in our possession, is about the size of a hen's egg, smooth upon its surface, and its section presenting a regular homogeneous mass, of a yellow colour, not unlike a roast chestnut; and we quite agree with the author of the paper that "it presents a good specimen of simple interstitial enlargement of the gland." We are strongly inclined to the opinion that most of these enlarged lachrymal glands are of a non-malignant nature.

The second case recorded by Dr. Halpin is involved in some obscurity. The tumour, which occurred in a female, was removed by

Dr. Roe in the Cavan Infirmary in 1844, who says: "It presented a very malignant as well as disfiguring appearance, the tumour occupying the place of the right eye, distending and elongating the upper eye-lid, and partly everting the lower, and compressing out of sight the globe, except at the inner or nasal angle. The integuments of the upper eye-lid were red and inflamed, and highly vascular, giving it a very suspicious and malignant look. The tumour was about the size of a small orange, and had not been attended with much pain until lately, although she had observed it for very many years." The tumour was removed through an incision made in the centre of the upper lid. "It was separated without much difficulty from the roof of the orbit, and gradually turned out and also detached from the eye. Finding, however, I had left a portion of it attached to the sclerotic coat, fearing its malignant nature, and knowing that the vision must be lost, it was thought better and more prudent to remove the whole globe, and any hardened cellular substance in the orbit." We have just been informed by Dr. Halpin that the disease has recently returned in the external canthus. In describing the symptoms of these orbital tumours, Dr. Halpin discusses the views of Dr. O'Beirne, with regard to the condition of the upper lid, the paralytic state of which has been considered by that gentleman as diagnostic of what he terms exophthalmia. By exophthalmia we suppose he means, in this instance at least, tumours situated within the cavity of the orbit, but external to the eye-ball; but it is quite clear that the precise position and anatomical relations of such growths must cause considerable variety in the position of the lid. If the lachrymal gland be the subject of this enlargement, or if a collection of matter takes place between the tunica vaginalis oculi and the roof of the orbit, or in fact if any morbid growth or fluid occupies the upper portion of the orbit, that is, the space between the globe and the orbital plate of the frontal bone, it is evident that if it presses forwards it must propel and depress the superior lid, no matter from which side of the levator palpebræ muscle it grows. But if such a growth proceeds from the apex of the orbit, it is manifest that it will protrude the eye-ball directly forward and not affect either lids; while a tumour or a collection of fluid, or an inflammation of the cellular tissue of the orbit occurring in its lower portion, yet still coming under the head of exophthalmia or exophthalmos, cannot in any way affect the upper lid. We assisted Mr. Cusack last autumn to remove a tumour, about the size of a large walnut, from the inferior portion of the orbit between it and the globe; here the pupil was slightly turned upwards and the lower lid bulged forward by the mechanical pressure of the abnormal growth, but the upper lid was quite unaffected(*a*). The following cases and remarks are also highly illustrative of the subject:—

In the beginning of this year, Dr. O'Ferrall, the surgeon in chief to St. Vincent's Hospital, in this city, published a most valuable

(*a*) See also on this subject *Gazette Medicale*. No. xxxvii, p. 723, where Dr. Halpin's case is quoted.

series of lectures upon the diagnosis and treatment of *Tumours in the Orbit*, in the Dublin Hospital Gazette. The valuable observations published by this gentleman, in the nineteenth volume of our former series, upon affections of the orbit, his extensive opportunities, and his acknowledged powers of diagnosis, led us to look forward with considerable interest to the publication of the cases related in the Hospital Gazette(*a*), of which the following is a brief abstract:—A man aged 21 had a painless tumour in the upper portion of the orbit, which protruded the eye, then partially amaurotid, downwards, forwards, and inwards, at least three-quarters of an inch beyond the plane of the sound eye. The upper lid was expanded to more than three times its ordinary dimensions, while the lower did not exceed its usual measurement. These characters of the lid serve, according to Dr. O'Ferrall, to shew the locality of the depressing force, namely, in the cellular tissue of the orbit, above the fibrous and muscular tissues which enveloped the eye. The tumour was irregularly elastic, yet apparently uniform in consistence. It was removed entire by means of a free incision parallel with and just below the eye-brow. It was found, as is frequently the case in these orbital tumours, to have descended deeper into the orbit than was at first imagined, or than could have been diagnosed by any previous examination. The tumour was found to be lobulated throughout, firm, elastic, and covered by a fine cellular capsule, which dipped into its structure. Its section presented a white, fibrous, and pearly surface, uniform in density, and brittle in fracture, exuding a creamy fluid under pressure; a portion of it placed under the field of a microscope exhibited all the characters of malignant disease. It is stated in the report that the mass bore no resemblance to the lachrymal gland, but that after its removal no trace of that body "could be felt remaining behind." Eighteen months subsequently the

(*a*) The Dublin Hospital Gazette, vol. ii., 1845–6, pp 161 to 241. We are indebted to Dr. O'Ferrall for the use of the wood-cuts used in this portion of our report.

tumour had not returned; the eye-ball had regained its natural position, but vision was still affected. It was of a year's duration when removed.

A girl aged 12:—Tumour in the right orbit, of seven months' duration, projecting the eye-ball downwards and outwards upon the cheek, quite without the orbit. An irregular tumour occupied the interval between the eye-brow and the eye, and from a point near the external margin of the orbit, to the internal side, the entire of which latter it completely filled. She suffered pain both in the eye and tumour; the integuments were discoloured, and of a mottled, dusky, pale rose colour, and tinged with yellow. The inferior portion of the lid below the transverse fold was natural and unaffected by the disease; vision very indistinct. The tumour was removed through an incision parallel with the brow, similar to the preceding case; and the wound healed rapidly, except at one point, where it remained fistulous for about a month. The eye, it is said, gradually returned into the orbit, but at the end of three months it had not quite ascended to the level of the sound eye; the visual power was also improved. Upon examination, the tumour appeared in some places to have the consistence of softened cartilage, and in others it had a pulpy appearance; its colour varied according to its densities, the firmest portions having a yellowish white tint, the softer being reddened, and exhibiting small bloody clots. "I considered it," says the author in his remarks, "to be a growth in the cellular and adipose tissue of the orbit, and lying between the roof of the cavity and the fibrous layers which enclose the eye and its appendages, and I believed it to be, as its dissection afterwards demonstrated, of the nature of cephaloma. The absence of other evidence of constitutional taint, and the certainty that it could not remain much longer in its situation without destruction of life," was the cause of its removal. The girl left the hospital in the end of 1841, but has not since been heard of, therefore the ultimate result of the removal of this tumour is still doubtful.

A female aged 23:—Cystiform tumour in the orbit, with protrusion and disorganization of the eye, which commenced eight years previous to her admission into hospital; she said the swelling of the eye began with nocturnal pains, and that the tumour from which she then suffered had been already three times operated upon. After the first operation it did not return for three years; on the second occasion the operation was not attended with any diminution of the swelling; the third time "the tumour was laid open, but it soon filled again."

"The left eye-ball protrudes so far, and descends so low on the cheek, that, when it is moved by its muscles, it brings to recollection the telescopic eye of the camelion. The large, thickened, and expanded superior eye-lid, descends, on the cheek, as low as its middle; but it no longer covers the globe of the eye. The eye-ball, ejected from beneath its natural curtain, lies naked upon the cheek, an inch below the tarsal margin of the eye-lid, and exposing three-fourths of its sphere to the contact and irritation of the air. The conjunctiva covering the sclerotic presents a close network of vessels, of venous and arterial hue. The globe itself is of the natural size, except its corneal portion, which is atrophied. The colour of the cornea is fleshy, and exhibits no traces of its original organization. The eye is in a state of constant movement, which, although evidently painful to the poor girl, cannot be restrained. Every movement of the sound eye is accompanied by a similar, though limited movement of the diseased eye, although the muscles must be elongated to double their natural measurement. It yields to the slightest touch, and is very elastic in recovering its figure. It imparts the sensation of fluid, but not the fluidity of serosity or pus. The idea of the white of an egg is that conveyed to the fingers, on a light manipulation of its surface." She suffered constant pain and irritation, besides which she was subject to paroxysms of spasmodic pain, occurring generally in the evening, during which she described her sufferings as amounting to agony; she had completely lost her rest, and felt totally exhausted. She was unwilling to submit to another operation on the tumour, and with difficulty

consented to a small puncture being made in it; from this a glairy fluid escaped, accompanied with some hæmorrhage.

"In this state of matters," says Dr. O'Ferrall, "it occurred to me that the removal of the useless eye might mitigate her sufferings. I proposed this operation in consultation, but was not so fortunate as to make an impression in favour of the proceeding. The grounds on which I suggested the operation were,—first, that the tumour, not being malignant, was probably not the source of the sufferings under which the patient pined away. Secondly, that the extraordinary elongation and tension of the muscles and nerve were, most probably, sufficient to account for the symptoms. And thirdly, that a disorganized and useless eye might be removed without detriment to the patient, and as an *anceps remedium* was, in such a state of suffering and decline, fully justifiable." The protruded globe was removed without difficulty, and on the following day a decided amendment in all her symptoms was experienced. "She is now (February, 1846) in excellent health; the tumour has scarcely increased in size, and gives her no inconvenience. The globe exhibited the usual appearance of an eye destroyed by inflammation. The transparent cornea was replaced by a fleshy substance, having no resemblance to its natural structure. Its antero-posterior diameter was flattened by pressure."

We quote the following judicious observations of the author, which entirely coincide with our own views on the subject, and are in accordance with the result of a case on which we operated some years ago, and which we shall describe at another time. "The composition of the tumour in this case, unlike those already related, was an union of solid and fluid elements, resembling in this respect the encysted tumours of the neck, ovary, and other parts. The complete identification of its solid portion with the periosteum of the roof of the orbit, rendered its extirpation impracticable. The result of two separate operations were conclusive on this point. The cystiform portion of the tumour had been reproduced after evacuation, and left no hope of its obliteration except by dressing the sac from the bottom, and obviating the incidental irritation by appropriate means. Some who examined this tumour considered it to be malignant, and others were of opinion that the cyst, when freely exposed, might throw out a fungus, and add to her calamities. The extirpation of the eye, already disorganized, appeared to me to be the rational indication. It was the peculiar and painful condition of the eye and its appendages which menaced the existence of the patient. In ordinary cases of tumour in the orbit the protrusion of the eye-ball is of gradual occurrence, and the parts are gradually accustomed to the extension. In ordinary cases also the globe is still covered by its lid, and is thus protected from the contact of foreign or irritating agencies. Under such circumstances extension is the only impression to which the parts are exposed. In the present case the extension of the nerve and muscles exceeded the usual limits in such instances; and there was besides superadded another cause of

irritation, of far greater power to create suffering, namely, spasm of the muscles of the part. In the present case the eye, no longer covered by its lid, was night and day exposed to atmospheric contact, and the extreme vascularity of its surface shewed the degree of excitement kept up in its organization. To this exposed condition, therefore, together with the more than usual elongation of the parts, I attribute the agonizing paroxysms of spasmodic pain, and pressure upon the eye-ball, which exhausted the strength and spirits of the patient. The extirpation of the eye, then, in the present case, was performed on a principle novel in the history of this operation, but justified, I have reason to think, by previous considerations, as well as by the very fortunate result."

Cases 4 and 5:—Abscesses in the orbit causing depression of the globe. These were good examples of sub-acute abscesses in the orbit, but not presenting any very remarkable symptoms from those already described elsewhere, it is unnecessary to detail them; they were punctured, and the patients did well.

Dr. O'Ferrall's sixth case was one of protrusion of the eye from inflammation of its fibrous investments in a woman aged thirty-four. It commenced twelve months previously with dimness of the left eye unaccompanied with pain; at the end of the third month vision was totally lost, and then severe pain and lachrymation commenced; these symptoms were relieved by treatment until three days before admission, when she suffered intense pain in the globe, and found the organ projecting. On admission the eye was found protruded three-fourths of an inch beyond its fellow, and its movements much restricted; the lid was œdematous and of a dusky red colour; there was considerable chemosis and lachrymation, but the cornea was clear, the pulse small and intermitting, the patient languid and not inclined to sleep. Under the influence of calomel and opium these symptoms subsided and the eye retired. Cases of this description are by no means uncommon in the practice of every ophthalmic surgeon. It is evident that it was one of general ophthalmitis; the chemosis was of an amber colour, which we have frequently observed in cases of intense inflammation occurring in eyes where vision had long previously been lost from some disorganizing process within the globe, and the lens, which is stated in the report as "of an opaque yellow hue, and projecting a little into the anterior chamber," was in all probability covered with lymph. The author enters into an explanation of the anatomical arrangement of the structures in the orbit, and says that the fibrous membrane, to which he has given the name of *Tunica Vaginalis Oculi*, which envelopes the orbit, limited the inflammation in this instance and caused the protuberance of the eye.

He next gives a description of the structures engaged in these diseases of the orbit, and explains the best mode of demonstrating them (see vol. xix. of our former series for 1841), and comes to the conclusion that we can, by the anatomical knowledge thus acquired, explain "the correspondence between the locality of the internal

mischief and the limitation of vascularity to certain portions of the lid," and thus "that inflammation, serous effusion, or abscess within the tunica vaginalis oculi generally affects the lower division of the palpebra; while similar changes, external to the fibrous tissue, are indicated externally by corresponding alterations in the upper portion." Our space does not permit us to enlarge further upon this subject, but we strongly recommend Dr. O'Ferrall's concluding clinical remarks, in the twenty-eighth number of the Dublin Hospital Gazette, to the attention of our readers.

Before, however, we take leave of this portion of the subject, we beg to observe, that Dr. O'Ferrall's claims to originality in investigating the structures of the orbit have been, on the one hand, very much overlooked, while, on the other, they have been very much misunderstood. A few years ago this gentleman drew particular attention to the subject in a paper which he read at the Royal Irish Academy upon the anatomy of certain structures within the orbit, and which paper, with some most interesting pathological additions, was reprinted in our former series. Nearly contemporaneously, however, with Dr. O'Ferrall, M. Bonnet of Lyons, and Mr. Bennet Lucas of London, described the same structures, although they did not demonstrate them in the same ingenious manner(*a*). In 1834, however, Mr. Dalrymple, in his Anatomy of the Eye, had accurately described this peculiar capsule; but long before the appearance of Mr. Dalrymple's work, a French observer, M. Tenon, in his *Memoires et Observationes sur l'Anatomie, la Pathologie, et la Chirurgie, et particulierement sur l'Organe de l'Oiel*, published in Paris in 1806, described this tunica vaginalis oculi, and therefore to him, as far as we yet know, the priority of the anatomical discovery is due; and yet we have no doubt than none of the authors who have recently described this structure have in anywise plagiarised from him. Malgaigne's name and writings should likewise be mentioned in connexion with this topic. In his *Traité d'Anatomie Chirurgicale*, which appeared in 1838, he described this fascia under the old name of *Tunica Albuginea*, but at the same time acknowledged the claims of Tenon, although he does not seem to be aware of the investigations of Mr. Dalrymple. When squint-cutting was the rage, surgeons naturally turned their attention to the anatomical relations of the muscles and other structures within the orbit; and MM. Guerin and Malgaigne both gave descriptions of this tunic, particularly the latter, in the fourth edition of his Manual of Operative Surgery(*b*), published in 1843, two years subsequent to Dr. O'Ferrall's treatise, with which he does not appear to be acquainted. He describes this membrane with great accuracy, shewing that it consists of two portions, one enveloping the sclerotic, and extending in a funnel-shaped envelope from the cornea to the sheath of the optic nerve; the other forming fibrous capsules for the muscles (as specified by Guerin

(*a*) See also Braithwaite's Retrospect, vol. iv. No. iv.
(*b*) *Manual de Medecine Operatoire*, p. 376, 4th edit.

under the title of *toge musculaire*). The reflection of the muscular or orbital from the sclerotic portion may cause the appearance of pulleys when accurately dissected. But anatomical discoveries are often the result of accident, pathological investigations generally follow from deep study and multiplied observations; and undoubtedly to our countryman, Dr. O'Ferrall, is due the entire credit of having explained and diagnosed some most interesting affections of the orbit, by a knowledge of this peculiar investing membrane, which separates the muscles from the globe, and also isolates certain affections occurring within that cavity, at the same time that its connexions with the lids externally is of great value in pointing out the seat of these morbid products(*a*).

M. Tavignot divides tumours of the orbit into eight genera: phlegmons, chronic abscesses, exostoses, lipomæ, cysts, cancers, aneurisms, and erectile growths(*b*).

On the Causes and premonitory Symptoms of Entropium and Trichiasis in the upper Lid.—Since the publication of our remarks upon these diseases, contained in the twenty-fifth and twenty-eighth volumes of the former series of this periodical, we have continued to pay particular attention to these affections, which are, perhaps, more frequent in Ireland than in any country in Europe of the same amount of population; and while our increased experience but confirms the opinion which we then expressed with regard to the causes and the cure of these most distressing complaints, we have been enabled, from a vast number of cases, to increase our knowledge upon the subject by diagnosing the disease at an earlier stage than has yet been effected. It is well known that persons labouring under entropium (who are generally in the lower ranks of society) seldom apply for relief until the disease is so well marked that it is scarcely possible to mistake it, and so far advanced that considerable mischief has been done to the cornea and conjunctiva by the irritation of the offending hairs. Although the inversion of the upper lid is sometimes very rapidly produced, yet, generally speaking, it is a slow and gradual process, requiring months and often years for its complete development. A report of this nature is unsuited for any lengthened or detailed account of this affection, but the following observations, formed upon a great number of cases, may serve to call the attention of ophthalmic surgeons to the subject.

When we look at a healthy eye, on a level with our own, the ciliæ of the upper lid should project so much forwards that we should see but the dark line of fringe which their points form. If the eye be directed downwards, and the lid falls a little, the upper surface of these hairs comes into view. The eye-lid forms two folds; the superior, large, flexible one, which is carried inwards by the action of the

(*a*) See an interesting case of exophthalmics in *Gazette des Hospitaux* for Aug. 22nd.

(*b*) *Revue Medicale*, for April, p. 594; and *Gazette Medico-Chirurgicale*, Fev.

levator palpebræ; and the inferior, lesser one, which is generally about three-eighths of an inch deep, and to which the integuments are intimately attached, as exhibited in the left eye of the accompanying woodcut.

When the lid droops or is closed by a voluntary effort, the superior, large, loose, and flexible fold is obliterated. Now in persons labouring under incipient entropium, long before any inversion or distortion of the lashes has taken place, the lower fold becomes preternaturally developed, as seen in the right eye of the foregoing illustration, made from a drawing of a young woman, who, at the time it was taken, had been labouring under the disease for four years previously. And, moreover, if we examine such an eye in profile, we shall find that this fold has become not only more developed, but that its curvature, which, in the normal state, is but slightly convex in the infero-superior direction, has become preternally increased, so as to present the form shewn in this representation, which was taken from a female who was not at the time (twelve months ago) at all conscious of her condition, as the lashes which, with the fold of the lid, were bent very much downwards, had not then quite touched the cornea. This vicious bend of the inferior fold of the lid is often of years' standing before it is perceived. When we evert the lid, the cause becomes manifest; immediately behind the line of the meibomian glands we perceive a deep curve or hollow in the cartilage running along the entire length of the lid, as we have endeavoured to represent in the wood-cut on the next page, taken from a drawing of the right eye of the girl whose representation is figured above.

This sulcus or depression in the cartilage has invariably a shining, tendinous appearance, and several conjunctival vessels may be seen running into it; and, as the disease advances, it has the appearance of a deep and rugged cicatrice, not unlike those marks which we perceive upon the inner surface of a lid which has been cured of granulations. All this time the conjunctiva lining the cartilage may be perfectly smooth and scarcely more vascular than natural, while the tissues of the eye itself may never have suffered from disease. Chronic ophthalmia is, no doubt, at times a cause of entropium, but, we believe, a much less frequent one than is generally supposed. We have lately seen several cases of inversion, both in the incipient and fully developed stage, in which there never had been any inflammatory affection of the ocular tunics. It is scarcely necessary to add, that when the disease is fully established, this internal sulcus becomes more deeply developed. The subjective symptoms are but very trifling; the patient complains of little or no uneasiness until one or more of the lashes touch the globe. At times, persons labouring under the incipient form complain of a tightness of the lid, and say that when they move it they feel as if it scraped the eye. This tightness, however, is not (as we observed in our former essay on this subject) caused by any shortening of the transverse length of the lid, but by its increased curvature from above downward.

We have often wondered why entropium was not induced by the pressure upon the eye-lashes of those glasses which it is now the fashion to squeeze into the orbit.

A careful examination of a few such cases as we have here described, will shew the inadequacy of any operation save that of completely removing the ciliæ, when they come to offend or irritate the eye. No incision made in the cartilage at right angles with this sulcus can ever restore its position; and we believe that those cases which have been relieved by the disfiguring and painful operation which Mr. Guthrie proposed as an addition to that of Sir P. Crampton's, were cured by making the longitudinal incision through the length of this morbid groove. It is evident that neither caustics nor astringents can effect any good in the early stages of this disease. We think we have succeeded in arresting its progress by the application of nitric acid to the integuments covering the fold externally, but it will require some time to decide on the value of this remedy.

Furnari says, that out of one hundred persons with sore eyes in North Africa, twenty-five have entropium and trichiasis, and believes that the great length of the eye-lids in the people of that region contributes to the production of this disease, a theory that tells in favour of the observations contained in the foregoing

notice. Lateral curvature of the spine, caused by photophobia, is no uncommon occurrence in children in Algeria and Egypt.

A new Instrument for removing palpebral Tumours.—Dr. Desmarres, formerly assistant to Dr. Sichel of Paris, has invented a new description of forceps for the more convenient removal of those little encysted and other tumours which so frequently occur in the eyelids. The posterior blade of this is expanded into an oval, slightly convex surface, about three-quarters of an inch in length; the anterior blade forms a ring the size of the outer margin of the posterior plate, and not unaptly resembles the ring of a key. These two branches, which separate by the usual spring in the shoulder of the instrument, can be retained in close approximation by means of a screw and nut placed a little below the roughened portion of the handles. The mode of using this instrument is to pass the smooth, polished posterior blade between the lid and the globe, and then, by screwing down the outer ring, compress within its circle a small portion of the lid. The object of the inventor is, by the pressure which it exercises, to arrest the annoying hæmorrhage which invariably occurs from removing those tumours externally, somewhat in the same manner as the pressure of the lip between the fingers arrests the hæmorrhage in the coronary arteries in removing cancer from that part.

For the object for which it was intended by the inventor this instrument produces the desired effect; but in the cases in which we tried it, the irritation and uneasiness attending its application appeared almost as great as the pain attending the operation of removing the tumour. The intention of this, and its practical application, is, however, in our opinion, not only unnecessary, but, in the generality of instances, positively incorrect. The majority of tumours occurring in the palpebræ are of the encysted kind, the contents of which are, particularly in their advanced stage, semi-fluid, frequently quite purulent. They are to be removed most effectually and with least pain from within. They should be allowed to advance to at least the size of a pea, unless they produce decided inconvenience, before they are interfered with. Their original seat is generally under the orbicular muscle, and if allowed to proceed without interference, they, in the great majority of instances, point internally, their seat being at once recognised by the ophthalmic surgeon, on everting the lid, by certain well-known appearances, namely, at first a slight dimple in the cartilage; then an increased redness deepening into a purple hue; afterwards a central elevation, which in process of time becomes yellow, from the absorption of the cartilage permitting the contents of the tumour to appear through, while the surrounding redness still continues.

As the disease advances, a small aperture, not larger than a pin-hole, is found in the centre of this yellow point, and through it the more fluid part of the contents is gradually discharged. If allowed to advance unchecked, the next stage of the disease is very remarkable; a fleshy papilla about the size of a split pea forms around this

aperture. Upon examining this minutely we find that the opening occurs in its centre, and that its edge overlaps the conjunctiva like a mushroom. If the patient presents with the disease in this advanced stage, this little fungous growth should at once be removed with a pair of curved scissars, but that will not cure the original affection. In whatever stage it presents,—and we would not advise its being interfered with till that of the yellow elevation,—it should be cut into (the lid being held in its inverted position by an assistant) with a very small, sharp-pointed scalpel, the blade of which is not above one-eighth of an inch in diameter. Unless the cartilage has become very much thinned, it is not easy to squeeze out the entire contents; but the following mode of procedure we have found perfectly effectual. With a fine silver spatula, such as that represented in our paper on otorrhœa in the twenty-fourth volume of the former series of this Journal, we press out the entire contents, and then having coated the extreme top of a small piece of silver wire with nitrate of silver (by dipping it into some melted caustic), so as just to coat its surface, we pass it rapidly through the incision, and roll it round in the sac, smearing the opening we have made with oil, in order to prevent any particles of the caustic which may adhere to it irritating the ocular conjunctiva. During the last three years which we have employed this mode of operating, we have scarcely ever witnessed a return of the disease.

There are, however, a class of tumours which occur in the palpebræ, the contents of which are of a much firmer nature than that last described, and which, in many instances, cannot be pressed out after an external opening has been made. From their resemblance to the structure of the conglomerate glands, they have been denominated *glandiform* by the late Mr. Tyrrell. They do not point internally, and therefore cannot be removed through the cartilage. They must be dissected out externally. One of their most frequent seats is in the lower lid, just beneath the punctum lachrymale, and when such is their situation we find that passing a probe into the lachrymal sac not only facilitates their removal, but insures the safety of the duct. In tumours of this description the instrument of Desmarres will be found useful. Some of these tumours not inaptly resemble, when rubbed between the fingers after their removal, a grain of swan-shot, so hard and unyielding are they. In the paper of the Parisian oculist in which the instrument is described, he enters at some length into the general management of these tumours, and recommends the use of various ointments for their dispersion; but, though we have given a fair trial to such means, we must say they have invariably proved inefficacious(*a*). In removing those small tarsal tumours externally, or in performing any minute operation upon the eyelids, where, from the very great and often abnormal vascularity of the parts, such hæmorrhage ensues as continually to obscure the growth which we are desirous to remove, the assistant

(*a*) *Annales d'Oculistique* for September, p. 111.

should be provided with a piece of fine sponge, about the size of a hazle-nut, held within the blades of a spring forceps, with which the blood should be continually absorbed. Dr. Sichel has recently noticed a small lipomatous tumour, of a yellow hue, situated in the substance of the lid, and generally towards the internal angle, which he states is usually connected with diseased liver, especially hypertrophy and fatty degeneration of that organ. If these little bodies are extirpated, they are reproduced, and their complete removal is only to be effected by an improvement of the predisposing cause.

Lachrymal Calculus.—Mr. Syme of Edinburgh has recorded a case of this rare affection in a man who five years previously "had let a little lime get into his eye: it presented all the appearance of a mucocle. Upon careful examination, however, it was found that the swelling was not in the sac but in the inferior lachrymal duct. It was removed by opening into the sac, and proved to be about the size of a 'barleycorn'; of an irregular form with tuberculated surface, and of a dark brown colour, so as very much to resemble a mulberry calculus in miniature." The chemical constituents are not given, but these bodies which generally resemble salivary calculi mostly consist of phosphate and carbonate of lime with animal matter(*a*). Dacryolotes, though now of rare occurrence, do not appear to have been so uncommon in the days of Le Dran, who gives a very good description of them.

A case styled *Emphysema of the Eye-lid*, from rupture of the lachrymal sac, has been going the rounds of the periodicals. It was originally reported by M. F. Dubois, of Neufchatel(*b*), but, from the account we read of it, it does not appear to have been more than an ordinary case of emphysema of the lids, which sometimes occurs from merely blowing the nose, in which the rupture is generally in the nasal mucous membrane.

Strabismus.—Mr. Brett, late superintendent of the Eye Infirmary at Calcutta, has furnished the Lancet of the 25th of April last with the result of his experience in removing this deformity by operation, and Mr. Walton of the Central London Opthalmic Institution has followed on the same subject in the recent numbers of the Medical Times(*c*). But we do not find anything in their descriptions but what was already known and practised by those who have been extensively engaged in this operation; and we would refer the authors of these papers to our communication on the subject, published in the Number of the Dublin Medical Journal for November, 1845, particularly with regard to the mode of fixing the eye, the ligatures upon the divided end of the muscle in certain cases, and the sutures of the conjunctiva(*d*). Owing to the great number of cases which were operated

(*a*) Edinburgh Monthly Journal of Medical Science, and Medical Gazette, for 12th June, 1846.

(*b*) *Journal de Chirurgie* for May, 1846.

(*c*) Medical Times for 2nd and 9th of January.

(*d*) To obviate the depression at the inner angle, and the protrusion of the globe, which sometimes follow this operation, M. Phillipi of Bourdeaux says that he has

upon in which the operation was totally inapplicable, and the failures—or, what is worse than failures, the distortions—that ensued, the public and several of the profession are still in doubt as to the propriety of interfering in any case of squint; it is of consequence that those who have been extensively engaged in these operations should honestly state their experience; and it is of particular moment that, where opportunities occur, *post-mortem* examinations should be made of eyes which have been operated upon, in order to see what change has taken place in the divided muscle.

Herr Böhm, of Berlin, has lately published a large monograph upon this subject(*a*), and given the result of four dissections of eyes which had been previously operated upon for strabismus. In one, a girl aged seventeen had the operation performed for very severe strabismus, consequent on corneal opacity, four months previous to death. Upon dissection, the conjunctiva was found firmly adherent to the sclerotic, particularly toward the inner side; the posterior fragment of the rectus muscle, which had been divided, was found to have contracted within the orbit, and to have formed a new attachment to the sclerotic, about three lines posterior to its original insertion, and its nasal surface and edges were intimately united to the conjunctiva.

A young man who had been cured of strabismus by the usual operation eight months previously, died in June, 1841; by the advice of Professor Schlem, the orbit was examined in the manner in which we usually dissect it, from above downwards. The internal rectus at once attracted attention from its shortness compared with the other straight muscles of the eye, as well as from the length of its tendon, or, more properly speaking, thick aponeurosis, which was connected with the globe only through the intervention of the hypertrophied conjunctiva; therefore in this case there was no secondary insertion of the muscle; but this we think the exception rather than the rule.

A girl aged fifteen had both internal recti divided in July, 1841. This was followed by divergence of both eyes, gradually increasing during the three following months. She died two years afterwards, and the following appearances were observed. In the right eye, that which turned most outward, the divided end of the muscle was found lying free in the cellular texture between the conjunctiva and sclerotic, and therefore could not exercise any power over the globe; and in the left, where the newly-acquired divergence was not so great, the

employed the following means: "To make but a small aperture in the conjunctiva, and to endeavour to promote the union of the ends of the divided muscle."—*Gazette des Hopitaux*, 18th June, 1846. And to effect this latter he divides it as far back in its fleshy portion as possible. We cannot agree with this theory, nor do we acknowledge the facts deduced by M. Phillipi. We think that when strabismus returns, it is in consequence of some fibre of the muscle having been originally omitted in the incision, or its divided ends reuniting.

(*a*) Das Schielen und der Sehnenschnitt in seinen Wirkungen auf Stellung und Sehkraft der Augen. Von Ludwig Böhm. Berlin, 1845.

divided end of the muscle was found attached to the conjunctiva, and, through its agency, had continued to exercise some power over the eye.

A woman, aged 40, was affected with slight diverging strabismus, accompanied with irregular motion of both eyes; thus, when the right eye was turned outwards, the pupil of the left was turned upwards, and so remained till the right assumed its straight position. If the right, on the contrary, was turned inwards, the pupil of the left was instantaneously turned downwards, and would so remain till the right assumed the straight position. Upon the peculiar condition of the muscles in this case many ingenious speculations were broached, but upon dissection, two years subsequently, the entire contents of the orbit were found perfectly natural.

The following interesting case is appended to Herr Böhm's observations. A man, aged 19, had squinted outwards in the right eye since his childhood. At six years old this affection was attended with double vision, but without pain or other inconvenience. The globe then gradually protruded, and the pupil now turned upwards and outwards, and at nineteen his vision in that eye had decreased so much that he could scarcely distinguish one coin from another. He was advised against having the operation performed, and the cause of the disease was diagnosed to be a non-malignant swelling at the bottom of the orbit. As he died of consumption at Berlin, an opportunity was afforded for the following interesting dissection. The optic nerve, for something more than a quarter of an inch posterior to its insertion into the sclerotic, was normal, but behind that it swelled out to the size and shape of a large olive, which lay across the bottom of the orbit, and projected the globe forwards and outwards in the manner we have described. Behind this swelling it again assumed its natural size, and turning back through the foramen opticum into the cranium, continued natural through the remainder of its course. The swelling had an unnaturally hard feel, and, when cut across, was found to consist chiefly of the thickened neurilema. Examined under the microscope the nervous matter was found unaltered. Swellings upon the nerves, in other parts of the body, are not unusual; but in the optic nerve it is a very rare occurrence indeed. The observations of M. Bouvoir confirm those of the Berlin surgeon, in shewing that the divided muscle generally forms a new and posterior insertion into the sclerotic. Further observations upon the subject will be received with much interest.

Cases have lately been recorded in the journals, in which accidental displacement of the pupil has effected the spontaneous cure of strabismus(*a*), and it has also been proposed to effect, by operation, an internal obliquity, in order to obviate the necessity of artificial pupil. Without entering at any length into this subject, we may mention that there are certain cases of strabismus in which

(*a*) *Gazette Medicale*, No. 35. Aug. 29.

the want of parallelism is caused by the foci of the eyes being of different lengths—that in which the focus is shortest, being almost invariably the eye to turn in, and such cases may be greatly improved, if not entirely remedied, by the use of glasses. There are other cases of strabismus which appear to be caused by certain portions of the retina becoming insensible; and in such cases, we should be very cautious indeed how we interfere, for it is quite possible that the removal of the deformity may render the patient's vision much less distinct than before. Under the head of strabismus, we would refer our readers to Mr. Brooke's paper on the advantages of sub-conjunctival tenotomy, communicated to the London Medical and Chirurgical Society(*a*).

Ectropion.—Several cases of this affection have been recorded in the journals; as they do not, however, present any remarkable peculiarities, and were generally removed by some of the operations already recommended by Fricke, Ammon, Dieffenbach, and others, they do not afford novelty sufficient for insertion here. Cases of this kind occur daily in the practice of every surgeon, but, unless accompanied by some form of illustration, they add little to what is already known upon this subject.

Symblepharon.—During the last two years, the number of cases where, from mechanical or chemical injuries, adhesion between the ocular and palpebral conjunctiva had resulted, which presented at St. Mark's Ophthalmic Hospital, caused us to pay particular attention to this subject, and we have found the following mode of operating perfectly successful, even in cases in which the method formerly in use, of merely dividing the fræna or extensive adhesions, had been more than once previously resorted to without effect. Some of these cases consisted in complete adhesion of either upper or lower lid, through the greater portion of its extent, to the surface of the globe; the newly-organized material, or dense, fibrous, connecting band, in some cases merely approaching the margin of the cornea, in others expanding largely over its surface, and rendering vision more or less imperfect. In some, the motion of the lid was completely checked by the shortness of the frænum and the intimate cellular connexion between the lid and globe, by which the motions of both were greatly curtailed: others, again, particularly where they proceeded from the angles of the eye toward the centre of the cornea, strongly resembled fleshy ptyregia. Beside these divisions, there is another which, in a pathological point of view, should be attended to; namely, into those which are attached by their whole length, and those in which the new attachment or adventitious membrane forms a bridge, leaving a portion (at the apex of the triangle) of either ocular or palpebral conjunctiva free. In these latter cases, a fine, flexible wire probe was passed under the arch, and where such arch or bridge did not exist, it was pushed through the lowest part of the adhesion, and its ends held by an assistant, or

(*a*) Lancet for July 7, p. 160.

retained in the left hand of the operator. By this means the globe was fixed, and the lid drawn forwards. The dissection was then commenced at the point most distant from the cornea, and we endeavoured to make the flap raised up as large as possible. In effecting this, our efforts will be greatly facilitated by doubling up the probe, and by its means drawing out the ptyregium from the globe. In this way we have succeeded in dissecting a very large flap of membrane off the entire surface of the cornea. If, upon examining the point from which it is reflected from the lid, it be found to have too extensive a base in the perpendicular direction, the lid should be everted, and this again lessened by repeated touches of a fine scalpel. The extreme apex of the flap should then be attached by a fine suture to the lowest point of raw surface on the *interior of the lid*, and other sutures applied along its edges as the extent of surface may require. By this means the external mucous or cuticular surface of the old adhesion or ptyregum will be presented to the raw surface of the subconjunctival cellular tissue on the globe, and thus adhesion completely prevented. Where this latter has been but of moderate extent, we have drawn the conjunctiva together, and closed it by three or four points of fine suture. There are cases in which the base of the triangle formed by the adhesion is on the globe, and the apex at the margin of the lid, leaving a large surface of the palpebral conjunctiva unaffected, and here we might be inclined merely to divide the fræna; but if the opacity has spread over the cornea, although we may succeed in removing the more immediate cause of the deformity, the leucoma will inevitably remain, and therefore we have, in such cases, carefully dissected the membrane off the cornea, and removing a portion of the palpebral conjunctiva, substituted the flap in its place, attaching it as already described.

We would recommend as long a time as possible to be allowed to elapse between the origin of the disease and the period of the operation, for by so doing, the band of adhesion becomes considerably lengthened, and also lessened in vascularity.

The principle of this operation has long been known, but has not, we believe, been hitherto acted on in this country. Dieffenbach has, we believe, described a mode of operating somewhat similar in principle, and M. Blandin has related a case during the last year, in which he succeeded in removing a symblepharon by a somewhat analogous proceeding(*a*).

Ptosis.—Mr. France has published an interesting paper on this subject in the last volume of Guy's Hospital Reports(*b*), and has detailed thirteen cases, which he treated for this affection, the perusal of which we would strongly recommend to our readers. From the number of causes which remotely tend to produce paralysis of the levator palpebræ, either alone or in connexion with other and

(*a*) *Gazette Medicale*, Feb. 28, 1846.
(*b*) Examples of Ptosis, with illustrated Remarks, by J. F. France.

more general paralytic affections, and of which Mr. France's cases afford us good examples, it would not be possible to compress within our limited space a sufficient account of the information contained within this paper, unless indeed we entered into a complete history of this disease: and, without quoting the cases themselves, we find it difficult to arrange the author's observations. The majority of the cases may be divided between those of debility and repletion, and were dependent upon affections commencing within the cranium, either general or circumscribed to the vicinity of the third pair of nerves. The greater liability of the motor oculi to paralysis than other nerves of the orbit is already well known, and, as the author observes, "the dyplopia of supervening inebriety is an exemplification of it. The third nerve here exhibits its aptitude (if I may use the expression) for paralysis, by being the first to discover impairment of function, whence, early in his intemperance, the individual 'qui studet calicibus epotandis' perceives this apparent duplication of objects, the mere result of his inability to converge the optic axis properly upon them." Ptosis is frequently attributable to cold or some rheumatic affection; but its greater liability to disease must, the author apprehends, be "ascribed to some constant predisposing condition of the nerve (one existing therefore in a state of health), brought into action as an element of disturbance when a morbid tendency has arisen;" and this predisposing cause he endeavours to account for by the intra-cranial anatomical relations of this nerve in its circuitous course, and the "dangerous allies" with which it is associated. During the last year Mr. France translated and published in the London Medical Gazette the valuable Essay of Professor Valentin on the "Functions of the Nerves of the Orbit;" in which paper the subject is treated in a most masterly and scientific manner. Valentin considers the superior division of the third to be a voluntary nerve, and believes that the inferior division presides over involuntary action; and in his theory his translator appears to agree. Another claimant for honour in the anatomical discussion of this subject has appeared in the person of Mr. Lonsdale, but in which discussion we cannot interfere. We refer our readers, however, to his paper on this subject in the Medical Gazette for the 27th of March last. Mr. France's cases of ptosis were treated by local depletion, mercury, and tonics, according to the most approved and general rules acknowledged by the profession in such matters. We have only to acknowledge that we do not think he made use of counter-irritation to a sufficient extent. In addition to the internal treatment suited to the case, and which is in every instance indispensable, we have employed with decided advantage the repeated application of blisters above the brow and in the neighbourhood of the temple; and likewise applied with manifestly good results stimulants, such as the solid nitrate of silver, to the skin of the paralysed lid. In a case of paralysis of the entire face (to be hereafter detailed) of many years' standing, in which the patient had been latterly unable to follow his usual occupation by the lid falling below the level of the lower margin of the pupil, we succeeded by the continued application of strong tincture of iodine, lunar caustic, and nitric acid, in causing such a contraction of the skin as enabled the patient (probably in part through the action of the occipito-frontalis muscle) to elevate it above the level of the superior margin of the pupil.

In one instance Mr. France adopted Mr. Hunt's operation of removing an elliptical portion of the skin. We use the expression, "Hunt's operation" here, more because a certain idea is associated with it than from any peculiarity in his method, beyond that recommended and practised by the early fathers of surgery, who, it would appear, almost invariably, if their "nervous and cardiac medicines should all miscarry," used "to extirpate a sufficient quantity of the relaxed cutis, and after healing up the wound, the remainder may become sufficiently shortened."(*a*) We learn from the writings of the ancient authors that cures resulted from this mode of procedure, although they knew not that the occipito-frontalis muscle was the immediate agent in causing the elevation of the lid. Mr. Hunt, however, was, we believe, the first to explain its mode of action, and also to recommend the superior incision to be made immediately below the brow; but we cannot say exactly how high or how low the older oculists, Bartischius, Rau, and others (who invented instruments for the purpose), made their incisions. Mr. France's case was successful.

AFFECTIONS OF THE CONJUNCTIVA, CORNEA, AND SCLEROTIC.

Photophobia.—Dr. Duval, of Argentan, in a memoir addressed to the Editor of the *Annales d'Oculistique*(*b*), after describing at length the phenomena of this remarkable symptom in ophthalmic diseases, and having carefully examined the nerves engaged in the motion and sensation of the eye, comes to the conclusion that photophobia, and the pain which constantly accompanies it, is only a morbid affection of the ophthalmic branch of the fifth pair of nerves, and that this symptom of intolerance of light always exists in every form of ophthalmia, as soon as the inflammation becomes intense enough to engage or interest one of the numerous ramifications of that nervous filament. His inquiry first extends to the vascular system; but, as he says, with great truth, redness does not always accompany photophobia; then it follows that this symptom is not necessarily the result of any alteration in either the venous or arterial vessels. The lymphatics are insensible, and as pain is always present in photophobia, he concludes that the lymphatic vessels cannot be the immediate seat of photophobia. The nervous system remains then to explain the cause of this very distressing symptom; but as the nerves which are engaged either di-

(*a*) Heister's Surgery, vol. i. p. 390, 7th edit. 1763. See also all the old works on ophthalmic surgery, particularly Wenzel's Manuel.

(*b*) Number for July, 1846.

rectly in, or subservient to, the junction of vision are so numerous, the solution of the question requires to be narrowed within a still smaller compass. The optic nerve and retina have been proved by experiment to be perfectly insensible; the motor oculi presides over the motions of the organ; those small branches of the great sympathetic, which are found around the eye, are not likely to produce this effect; and it is to the numerous sub-divisions and branches of the fifth, which gives to the vital vessels the necessary impulse for performing the functions of nutrition and secretion, that photophobia is to be attributed. To this it may be added, that touching any filament of this nerve causes the most excruciating pain.

This theory of Duval's is perhaps the true one, but it is not original. Dr. Mackenzie, in the last edition of his work on the eye, says that the extreme intolerance of light, spasmodic contraction of the lids and epiphora, is explained by the anatomical fact, "that the lachrymal nerve, after supplying the lachrymal gland, goes to the conjunctiva and orbicularis palpebrarum, and may tend to establish a strong nervous sympathy between these parts." Mr. Lawrence believes that photophobia is the result of "a disordered sensibility of the retina, dependent on the state of the alimentary canal;" but this theory wants proof.

Among the causes of photophobia enumerated by Duval are included bandages applied too tightly over the eyes; this, however, is a cause that, in this country at least, seldom occurs. Poultices, and collyria especially, when employed in ophthalmia depending on constitutional derangement, and the patient having been kept in the dark for any length of time, are also mentioned by this author; but every practical oculist is well aware that this symptom will arise, particularly in cases of what are termed strumous ophthalmia, where none of these causes have acted. The system of keeping the eyes closely covered up, and retaining the patient for months together in a darkened apartment, which was formerly employed in this country, but now happily abolished, no doubt contributed in a great degree to keep up, if not absolutely cause, this great insensibility to light.

Having enumerated the various remedies usually employed to mitigate or arrest photophobia, such as opium, belladonna, camphor, nitrate of silver, &c., &c., in spite of each or all of which the disease, as we all know, often proves rebellious, M. Duval recommends our having recourse to excision of the conjunctiva. To effect this the lids are separated by means of elevators, and then, with a pair of curved, flat scissars, the conjunctiva is excised all round the cornea, near the junction of that membrane with the sclerotic. This is a practice of which we have had no experience, but which we should be loath either to recommend to others or to adopt ourselves. For children especially, we have found the application of the solid lunar caustic, drawn gently two or three times across the lids, so as just

(*a*) Mackenzie on the Eye, p. 416.

to blacken the surface, as recommended by the late Mr. Hocken, to be exceedingly useful in many cases of photophobia. It is not a panacea, as some suppose; yet we have found it highly serviceable, not only in cases of photophobia, but in cases of conjunctivitis, particularly in young children, in many of which it produces the most marvellously rapid effects. We suppose it acts as a counter-irritant; it produces little effect, either in pustular ophthalmia or in inflammation of those textures deeper in the eye than the conjunctiva. In cases of blepharospasmus, we have found the vapour of strong prussic acid particularly useful; but this is the only disease in which we ever saw the slightest beneficial effect produced by it, and we gave it a long and a fair trial.

Serous Cysts.—Dr. Sichel, the distinguished Parisian oculist, has written an extensive memoir(*a*) on those serous cysts, which occur either in or under the conjunctiva of the globe or lids. The hydatid form are disphonous, elastic, of a pale red colour, small in size, elliptical or oval in shape, and are generally found beneath the great palpebro-ocular fold of the conjunctiva. They produce no pain or inconvenience, except that caused by their size in the advanced stage. The only tumour they are likely to be mistaken for is that formed by the cysticircus of the subconjunctival cellular tissue. Under the head of serous tumours, he enumerates those which follow wounds of the sclerotic, which have but incompletely cicatrized, and are formed by a small fistulous opening remaining in the site of the injury, while the conjunctiva has healed over it. In this case, the tumour is formed by aqueous fluid from the interior of the globe. Dr. Sichel has minutely examined these small hydatid vessels, and states that they consist of a pseudo-fibrous membrane, containing fluid, and intersected with numerous fine primitive fibres intersecting each other in every direction, and that they do not in any instance contain the echinococcus, as was believed some time ago. When small, these tumours are best removed with a curved scissars, as one is anxious to extirpate them entire in order to insure success, and also for the purpose of examination. Dr. William Soemmering has, however, recorded a case (in the same memoir) of a young girl at Frankfort, who had one of those subconjunctival hydatid cysts immediately below the inferior border of the cornea; it was sixteen millimetres in length, seven in height, and six in breadth. Upon removal it presented a hardness almost cartilaginous, but on the sac being opened, it immediately softened, and was found to contain several echinococci, but no specimen of the cysticircus. Small serous cysts upon the external margin of the palpebral edges, are too well known to require description.

Gonorrhœal Ophthalmia.—Dr. Hairion, of Louvain, has lately investigated this subject with remarkable industry, and written several papers on it in the *Annales d'Oculistique*, during the past year, which, with some additional matter, have recently been pub-

(*a*) *Archives Generales de Medecine*, Aug. 1846.

lished in a separate work(*a*). He holds the opinion, that gonorrhœa and chancre are identical, and that one as well as the other may be followed by constitutional symptoms; and he divides this form of inflammation of the eye into "syphilitic gonorrhœal ophthalmia" and "gonorrhœal ophthalmia not syphilitic." The first of these is in its nature identical with true gonorrhœa, and is invariably caused by the direct application of the virus to the conjunctiva. In addition to those symptoms of violent inflammation and profuse discharge, which are well known to characterize this specific disease, the Louvain professor states that he has discovered an invariably attendant symptom, which, if it should prove correct, must be of great value in enabling the surgeon to diagnose the true gonorrhœal ophthalmia, the result of contact. It is the constant presence of a small round or oval tumour under the skin, painful on pressure, situated in front of the ear on the affected side, from the enlargement of a lymphatic ganglion. The author says he discovered this about three years ago, in a patient whose conjunctiva was inoculated with gonorrhœal matter with the hope of removing pannus(*b*). That he has since observed it in nine cases where there was no doubt as to the nature of the infection; while it was absent in some hundred cases of purulent ophthalmia not syphilitic or gonorrhœal, which he had an opportunity of observing. To this enlargement he has given the name of "*bubon-pre-auriculaire;*" the absence of this peculiar symptom constitutes the second or non-syphilitic form of gonorrhœal ophthalmia. His paper contains a number of propositions on this subject. In his opinion, true gonorrhœal ophthalmia can only be produced by actual contact with the matter of syphilitic gonorrhœa; and he believes that that form of gonorrhœal ophthalmia which may be produced by sympathy or metastasis, has no essential character to distinguish it from other blennorrhœal ophthalmia. These propositions are repetitions of the foregoing observations, but arranged with that hair-splitting minuteness which characterizes many of the continental writers, especially on ophthalmic diseases. We think gonorrhœal ophthalmia sometimes occurs from sympathy, in which case it can be distinguished from the form induced by contact by the less intensity of the inflammation, by its appearing on the same day as the running from the urether, and by its affecting both eyes simultaneously. Two cases have been recorded of production of this disease by miasma, but the author very justly observes, that more facts are required to support this theory, which every day's observation appears to corroborate. On the other hand, Dr. Cunier, in reviewing the work from which we have quoted these remarks, states his belief in the operation of "miasma," where a large number of patients affected with gonorrhœa are crowded into a small

(*a*) *De l'Ophthalmie Gonorrhoïque.* Par Frederic Hairion. Louvain. de Imprimerie de P. J. Peeters. 1846.

(*b*) We believe we were the first in this country to notice this mode of treating pannus by inoculation. See Austria, its Literary, Scientific, and Medical Institutions. Dublin, 1843, p. 251.

space. Ricord, however, denies its possibility, and the authorities and cases cited by the reviewer by no means strengthen his case, while they rather serve to prove that the disease is propagated by direct contact(*a*). In a late number of his journal, Dr. Cunier states, that since the publication of Dr. Hairion's observations, he has paid particular attention to the subject of the pre-auricular bubo, and that, although he has observed it in all cases of gonorrhœal ophthalmia, he has likewise seen it in several cases of severe ophthalmia of a scrofulous character, where there was no evidence of syphilitic infection(*b*).

Ophthalmia Neonatorum.—Dr. Eschrish states, that in the ophthalmia of new-born infants, he has always affected a perfect cure in a shorter time than usual (one week), by surrounding the eye or eyes with a thick layer of mercurial ointment. We should be sorry to trust a severe case of this disease to this remedy, and the Munich physician acknowledges in his paper that, in addition to the mercurial inunction, he uses frequent injections of tepid water, and when the swelling and discharge have lessened, he employs a weak caustic solution(*c*). Prof. Von Ammon recommends a lotion of six grains of extract of belladonna and ten drops of lime water to four ounces of distilled water; with these the eyes are to be steeped every half hour; and in the interim a bandage, wet with the solution, is to be applied over the eyes. His object in using the belladonna is to allay the spasm of the eye-lids, and by facilitating the matter to allay the swelling of the conjunctiva and cornea. This certainly is not heroic practice, and few practitioners in this country would trust a patient to it alone. Having constantly remarked an extensive state of ulceration in the conjunctiva of the upper lid, in the severe forms of this disease, I now generally evert the lid to examine its inner surface as soon as a case presents itself; and we have several times succeeded in cutting short the disease by at once applying a strong solution of nitrate of silver to this part alone. We beg to call the attention of ophthalmic surgeons to this subject.

Opacities of the Cornea.—Scarcely a month passes that we do not read of the wonderful cures effected in cases of specks, feathers, nebulæ, clouds, opacities, pearls, leucomas, albugos, cicatrices, and even staphylomas of the cornea, by specifics of various kinds, from prussic acid to mesmerism; but, from the days of Tobit to Turnbull the same silence or ignorance in describing the positive pathological condition of the cornea has prevailed. Some of the cases of corneal opacity may be removed simply by time and the improvement of the general health, whilst others never can be obliterated; the difference consisting in the original cause, the precise seat of the opacity, and the existence or non-existence of synchia anterior, or attachment of the iris to the cornea, in which case, no matter how

(*a*) *Annales d'Oculistique.* Sept. 1846, p. 116.

(*b*) *Annales d'Oculistique,* for Nov. 1846. See also Mr. Close's observations in the Medical Times for 16th May, 1846.

(*c*) *Medicinische Correspondens Blatt; Bairischer,* for August.

small the opacity, it never is removed; while, where it does not exist, the cornea may clear either by the efforts of nature or by the influence of remedies, notwithstanding that the opacity may extend over its entire surface. There are, however, cases of very slight opacity indeed, which never are removed, and therefore, it behoves the ophthalmic surgeon to be thoroughly acquainted with all these circumstances, in order to form an accurate prognosis, and to be able to state to patients, or their friends, what may be the final result of such cases.

One of the most philosophical papers which we have read upon this subject, is that of Szokalski, published in the *Archieves fur Physiologische Heilkunde*(*a*). He has examined, pathologically, and with great minuteness, the various laminæ of the cornea, and draws the following conclusions:—In the cloudy opacities the epithileal cellules are more compact and more adherent to the cornea; that total staphyloma corneæ is principally produced by an abnormal development of the epithelial cells; and that adherence of the iris to the cornea is not an essential pathological feature of this peculiar state. Cerosis of the conjunctiva is an alteration of the epithelium analogous to pityriasis, and the red points sometimes observed in an inflamed cornea do not precede the development of the vessels, as some authors have believed. Inflammation of the parenchyma of the cornea causes this peculiar appearance of red points, while that of the conjunctiva gives rise to the development of phlyctenulæ, the fluid in which sometimes contains globules altered by inflammation. In these cases of phlyctenulæ, Szolaski recommends the evacuation of the fluid with a cataract needle, for if the fibrous deposit contained in them be allowed to remain, the suppuration which follows will obscure the cornea. Pannus consists in a hypertrophy of the vessels and degeneration of the epithelium. Ptyregum is formed by the hypertrophy of the submucous tissue covering the sclerotic, and by the development of the cellular tissue between the substance of the cornea and its epithelium. Obscurity and ulceration of the cornea, following the section of the fifth pair of nerves, the author does not believe to be the result of true inflammation, for in such cases he never could discover either inflammatory globules or pus. When inflammation attacks the cornea it presents the same characters as when developed in other tissues, consisting of accumulation of blood in the vessels, granular exudation, inflammatory globules, and pus. When the granular exudation instead of changing into pus, becomes organized into filaments; it closely unites the laminæ of the cornea, which thus lose their transparency, and thus form that species of opacity termed leucoma. He does not believe that the membrane of aqueous humour(*b*) extends over the anterior face of the iris, and states that aquo capsulitis is merely a simultaneous inflammation of the iris and posterior

(*a*) See *Gazette Medicale de Paris*, No. xliv.

(*b*) On the Continent this is generally styled the membrane of Descemet or the membrane of Dumours.

face of the cornea, because the same vessels and nerves are common to these two parts. The internal face of the cornea is covered by a layer of epithelium, the detached scales of which, when they float in the aqueous fluid, Donné considers to be the cause of muscæ volitantes. The elastic cornea of Demour is never altered: it is destroyed when abscess of the cornea has penetrated to the interior. Although we cannot quite agree with the anatomical opinion advanced by Szokalski, that the membrane of Demour does not cover the face of the iris, yet we have often been at a loss to account for the circumstance of the great opacity of portions of this membrane in cases of cornitis, and in cases of intense inflammation of itself originally, while in the most advanced forms of both these the iris remained quite unaffected, and perfectly brilliant in colour. On the other hand, one of the earliest and most remarkable symptoms in some forms of iritis is inflammation and opacity of this membrane, and here we must suppose it has spread by continuity of surface from that covering of the iris.

Fungous Growth produced by a Wound of the Cornea.—Dr. Giberto Scotti, oculist in the University of Pavia, has recorded an account in the Milan Gazette, of an injury of this nature, which occurred in a girl about four years of age, from a sharp-pointed instrument penetrating the globe of the left eye. Upon examination the iris was found only partially dilated, and the pupil normal. The eye was suffused with tears; on the upper and outer portion of the cornea was observed a round speck about a line in diameter, which gave to the form of the eye a very strange appearance. This speck was opaque and of a greyish-white hue; the pain over this spot was trifling, even when pressed upon by the finger; it was at first suspected to be a foreign body, and, therefore, tried to be detached by a Beer's spatula; it was then, however, discovered to be an adventitious growth from the wound in the cornea; it was elastic, and found to adhere only by its central portion, as its brim or margin was capable of being elevated all round from the surface on which it lay. "I saw immediately," says the relator, "that it was a lesion of the cornea, which, having been softened by the blow, had grown up into a fungous excrescence, flattened by the habitual pressure of the eye-lid upon it." It was touched with the solid nitrate of silver, and belladonna stupes applied to the eye: this mode of treatment, persevered in for four or five days, completely removed the disease, leaving a very slight opacity in the cicatrix of the wound(*a*).

Egyptian Ophthalmia.—An outbreak of this disease occurred in an epidemic form among the Austrian soldiers in the garrison at Mayence, in which, during a single week, a thousand men were attacked(*b*). The disease occurred in the autumn of the year 1845, and the soldiers were then in camp on a portion of very sandy ground in the vicinity of the town, and the heat was so intense that the men

(*a*) *Gazetta Medica de Milano*, tom. v. no. 1.

(*b*) *Zeitschrift fur die Gesammte Medecin*,—*Gazette Medicale*; and Medical Times for 15th August.

undressed every night. The disease was characterized, in addition to the ordinary inflammation of the conjunctiva, by a number of phlyctenæ, or vesicles, which appeared on the inner surface of the lower eye-lid, towards the external angle, and which generally spread over the entire palpebral conjunctiva: there was but little external redness of the lids, but a granular condition of the palpebral conjunctiva generally followed. This epidemic yielded to the liberal use of caustic; and but few cases of great severity occurred in it. It will be remembered that a severe epidemic ophthalmia occurred among the Prussian troops at Mayence in 1818.

Staphyloma.—In cases of conical staphyloma engaging the cornea alone, and where the white, horny mass protruded so far as to produce a remarkable deformity, and by projecting between the lids, to cause such an uneasiness as to demand surgical interference, we have lately performed the following operation with the view of obviating the escape of the humours, the suppurative inflammation, and consequent collapse of the globe which so frequently follows the ordinary mode of proceeding.

Having fixed the lids as in the operation for extraction, we transfix the most conical portion of the cornea with a fine hook, and then pass a small, curved sewing needle, armed with a fine ligature, through its substance from below upwards, and, passing it through the anterior chamber, bring it out through the cornea above, within about a line from its sclerotic margin. We then pass a cataract knife across the cornea as in making the lower section for extraction, taking care not to cut out the needle, and with a curved scissors remove the flap, as is usually done in the ordinary operation. Making sure that we have removed a sufficient quantity of the projecting diseased mass, we draw the needle and ligature through, and, by knotting the latter, bring the edges together, as in any other simple incised wound; and in two out of the three instances in which we have tried this plan of treatment it was perfectly successful, the edges of the cornea adhering, and the eye subsequently presenting a simple leucoma, instead of the previous staphyloma. One of these cases was operated upon twelve months ago, and there has been no return of the projection since. Considerable difficulty will be experienced in passing the needle through the thickened cornea, which in some cases is as hard as cartilage.

In cases of more general staphyloma, where the sclerotic and choroid are also engaged in the projection, we have succeeded in reducing the size of the globe within the ordinary dimensions by the following means. With a large, flat, spear-shaped needle, we pierce the cornea, and giving the instrument a half turn, so as to enlarge the aperture, permit as much of the fluid contained within, to escape, as will reduce the globe to the normal size; the lids are then closed, and a pledget of lint applied upon them as tight as the patient can comfortably bear. This we repeat every second or third day, each time reapplying the pad, until we find that the eye does not continue to increase in bulk after the operation. It will generally

require to be repeated six or eight times, sometimes oftener; but we have frequently succeeded in permanently reducing the deformity by this means, at the same time that the figure of the globe is preserved. We never saw inflammation follow the tapping but once, and that was in a very unruly, irritable, scrofulous subject. A growing staphyloma, such as that which follows upon extensive ulceration of the cornea with prolapsed iris, may, after the inflammatory stage has subsided, be arrested by tapping it, and applying moderate pressure. In the same manner, where the conjunctiva of the cornea and a large portion of the laminated cornea had ulcerated, but were still tolerably transparent, and that the remaining layers of the cornea bulged forward in such a manner as to threaten to give way hourly, we have succeeded in preventing this unhappy accident, and restoring the cornea unblemished to its natural condition, by keeping up continued moderate pressure upon the lid for some days, at the same time that the ulcer was touched with a sol. nit. argenti; while other means were taken to lessen the inflammation and to promote a healthy condition of the diseased parts. In cases of hydrophthalmia and staphyloma, where the aqueous fluid is evacuated, it will be found to have acquired a remarkably saltish taste, probably from some increase in the quantity of muriate of soda which it contains.

By one of the last numbers of the Milan Gazette we perceive that Professor Quadri has in his operations for staphyloma also endeavoured to attain the object which we have had in view, namely, that of preserving the lens and humours, and preventing the collapse of the globe; but his operation differs in no wise from that usually performed, except in immediately closing the lids and endeavouring to promote adhesion of the cornea, without suppuration. By the introduction of the needle we fix the globe; to a certain degree present a barrier to the sudden evacuation of the lens or humours; and perhaps hold back the iris in its place, if it is not engaged in the staphyloma; and, by drawing the ligatures immediately together, not only prevent the possibility of the globe collapsing, but place the cornea in the best possible condition for adhesion.

Ophthalmic Statistics.—Although we are no advocates for the statistical method of treating disease, yet the proportions which certain diseases bear to the great mass of a population; their numerical comparison with all other diseases; the record of the ages, sexes, and localities where they occur; the seasons of the year in which they prevail; the influence which climate, variations of temperature, elevation, soil, occupation, and habits of life, &c., exercise in such cases; and, when such diseases prove fatal, their mortality in proportion to all other diseases, and to the population at large; the effect, moreover, of late or early treatment; the influence of density or paucity of population in certain towns and districts, and the proportion of medical relief, &c., are all subjects of great vital importance, and deserving the strictest attention both of the practical physician and the state. In some diseases statistical tables are of more value than others;

where they can be correctly obtained and accurately registered, the information which they afford is of very great value in enabling the compiler or arranger of special works upon the subject to state with a certain degree of accuracy, at what age, in what sex, in what country, and at what period of the year, &c., such or such diseases most frequently prevail. Having been ourselves extensively engaged in drawing up statistical records, we have studied somewhat in this school; and we have, moreover, learned to receive with caution statistical information unless where we have a knowledge of the means by which it was obtained.

Three years ago we commenced to register ophthalmic affections, according to the simplest method that we could devise; and while tables, containing the result of our observations, are published from year to year(*a*), we do not think fit to generalize till the number of our observations shall amount to many thousands. In order, moreover, to make proper statistical reports on ophthalmic diseases, it would be necessary to attach to them explanatory observations upon the ideas which the author attaches to certain expressions, as the nomenclature and classification of ophthalmic diseases is neither perfect nor universal: we would, however, suggest the employment of statistical registries to those gentlemen who have the management of large public institutions.

Dr. Cunier, of Brussels, has worked this subject with great industry for some time past, and published a series of researches upon the ophthalmic diseases of the province of Brabant in his valuable periodical, the *Annales d'Oculistique*, from which we extract the following general conclusions(*b*). In Belgium and Holland, the poor and working class object to employ any treatment in the commencement of an ophthalmia, from a prejudice which we ourselves have often witnessed in the Orient, and which the inhabitants of Belgium very likely received, through the Spaniards, from the Moors,—that it is unlucky to interfere with a sore eye. Thus we have seen persons in Egypt and Syria with quantities of dust and collections of flies and other insects in the corners of the eyes, in cases of ophthalmia, from a belief that ordinary cleansing was injurious. Hence comes the old Spanish proverb, "El mal del ojo. Curarse con ol codo,"—"sore eyes are to be cured by the elbow." There are Arab, Dutch, and Flemish proverbs to the like effect. In Brabant scrofulous ophthalmia is very common, and next in frequency occurs the rheumatic, to which women are more subject than men before puberty, but after that period the sexes are equal, and the affection is generally from twelve to sixteen per cent. of all ophthalmic diseases. Both rheumatic and catarrhal ophthalmia, which prevails very much in the low countries, is attributed to atmospheric influences,

(*a*) See Annual Reports of St. Mark's Ophthalmic Hospital, and Diseases of the Eye and Ear.

(*b*) *Rapport adressé a M. Liedts, Gouverneur du Brabant, Président de la Chambre des Representants*, &c. &c., published in the Numbers of the *Annales* for the year 1846.

the frequent changes of temperature, cold and damp, and to the ill construction and bad ventilation of the workhouses, manufactories, and schools, &c., where large masses of the younger portion of the population are crowded. Affections of the choroid are common, and women much more subject to them than men; and in most of these latter the disease appears to be connected with affections of the uterus, bowels, or the glandular system. During the five years over which Dr. Cunier's observations extend, cataract was observed, along with choroiditis, in 105 out of 343 cases; and ninety-two of glaucoma occurred, eight of which supervened on the operation by couching. Glaucoma, had, however, be better specified, in a report of this nature, as slow internal inflammation of the eye, commencing with loss of vision, accompanied by change of colour in the iris, which almost invariably turns green, and the pupil acquiring a dull muddy hue, at the same time that the choroid is in all probability greatly congested, if not inflamed. As the disease proceeds, the iris bulges forward, the lens becomes opaque, and in time the eye softens, with or without staphyloma of the choroid. Dr. Cunier states, with great truth, that the persons most subject to those peculiar alterations in the organs of sight, and to choroiditis, are those who follow a sedentary occupation, employ their eyes at fine work, with the body bent, who inhabit cold, damp rooms, and who work a great deal with light derived from a small candle, but magnified by passing through a globe of water—a common practice all through the Continent. In eighteen out of sixty-four cases of gonorrhœal ophthalmia, arthritis also existed, but was confined to the knees and tempero-maxillary articulations, as originally remarked by Swediaur. It is remarkable that the disease was sometimes produced by the patients washing their eyes with their urine, a fact which we remember hearing Dr. Wilmot mention many years ago, in his lectures at the College of Surgeons, as producing this disease in Ireland. Only thirty-six cases of syphilitic iritis are mentioned, a remarkably small proportion indeed, but instancing the less frequency and less severity of secondary symptoms on the Continent than with us. In this country it is more frequent in males; in Belgium the great majority of cases occurred in females. Cunier never met with, nor have we ourselves ever seen, iritis caused by mercury. In Belgium most of the cases of iritis had been treated in the primary instance without mercury. Out of 2607 cases of ophthalmic diseases noted in our registry of the last two years, there were eighteen cases of undoubted syphilitic iritis, fourteen males and four females.

Entozoa in the Eye.—Instances of parasitic animals in the membranes or chambers of the human eye are constantly recorded in the Journals, and at page 237 we mentioned cases of their occurrence in tumours of the conjunctiva. Signor Carrera has communicated to the *Boletin de Medicina* of Madrid the case of a man, who, having slept in the open air, was next day attacked with severe pain in the left eye, which rendered him unfit to follow his usual occupation,

while, to all appearance, the organ was perfectly healthy. Upon a careful examination a small red spot was discovered on the sclerotic, towards the internal canthus, and by friction of the upper eye-lid a number of small white worms were observed to come down over the cornea, and others were in a short time seen to traverse the globe in all directions. A stimulating collyrium was dropped into the eye, and nearly forty of these animals were extracted. They were about the diameter of a hair in thickness, and about half a line long; were white in colour, with a minute black point on the head. There is, however, a manifest looseness of description in the article, as well as a great want of entomological knowledge. Signor Alessi has related a case in which an entozoon, in shape like a worm, and about two lines and a half long, and of a dirty white colour, was seen swimming in the anterior chamber, but the same want of definite information with regard to the precise nature of the animal occurs here as in the former case. The patient laboured under ophthalmia, chiefly affecting the cornea, so that the case had previously been treated for keratitis. The treatment consisted in the use of mercury by the endermic method, viz., the repeated application of small blisters around the orbit, which were dressed with calomel, by which it is reported that the inflammation soon disappeared, and the animal, which had lain for some time motionless in the anterior chamber, was absorbed.

Turpentine Collyria.—M. Laugièr has lately made use of this application in several cases at the Hospital Beaujon. His experiments were made upon cases of conjunctivitis, both acute and chronic tylosis, dacryosistis or inflammation of the lachrymal sac, and also sclerotitis, all of which had been (we will not say correctly) already treated with a collyrium of nitrate of silver, and, consequently, appeared to the author to be the most appropriate for judging of the comparative effects of the two remedies. The formula which he gives is as follows: To twenty grains of Venice turpentine, heated in an earthenware mortar, add, when sufficiently fluid, twenty drops of the essence of turpentine, and triturate: three or four drops of this to be dropped between the eye-lids night and morning. Its action was most beneficial, and seemed preferable to that of the nitrate of silver, employed in the strength of fifteen centigrammes in thirty grammes of distilled water. M. Laugièr afterwards tried it with a number of extern patients attending the hospital and affected with acute disease of the conjunctiva and cornea, who had not been submitted to any previous treatment, and their cures were sufficiently numerous and rapid to testify to its harmlessness and efficacy. The proposer of this remedy suggests the propriety of employing the turpentine in the form of an ointment, by mixing it with some fatty substance. He has used the pure oil of turpentine; it, however, increased the pain exceedingly; he therefore recommends its administration in the formula already given(*a*).

(*a*) *Gazette des Hopitaux*, July 14, 1846.

We have made some trials with this remedy, particularly in cases of chronic ophthalmia, and can safely say it does no harm. Prepared according to the formula of M. Laugièr, it very soon congeals, and requires to be heated before using.

We beg to refer our readers to our observations on the use of Atropine and Belladonna, contained in our last Number.

Myopia, Presbyopia, and Asthenopia.—Although the subjects of near sight, aged sight, and impaired vision, or those abnormal conditions which occasionally take place in the refracting media of the eye, and described under the above heads, have been treated at some length in the various systems of ophthalmic medicine, there is still a great deal to be learned upon the subject, particularly by the general surgeon, the optician, and even the public, although we would not in general include this latter class among those to be instructed on professional subjects. It is evident that as countries have increased in civilization, wealth, manufacture, and literature, so has the necessity for the use of glasses increased. If this observation be correct it tends to strengthen the opinion which we expressed in the first part of this Report, that myopia and presbyopia, &c., are acquired imperfections, the result, in many instances, of the peculiar habits of the individual, while at the same time there is sufficient evidence to shew that myopia is often an hereditary peculiarity. We here exclude those forms of short-sightedness produced by manifest disease, such as cornea conica and cornea globosa, dropsy of the aqueous chamber, or other conditions, the result of inflammatory actions going forward in the eye. How the ancients managed without spectacles, if the affections requiring such were as common in their days as in our's, it is difficult to conceive. The merit of the discovery of spectacles has been disputed, and the invention has been claimed for Roger Bacon, Alexander Spina, Salvino Armati, and Maurolicus. To the Oxford friar, however, the claim is generally ceded. F. Eugene de Caesemaecker, an optician at Ghent, has lately written a tract(*a*) on the use of glasses, in which he appears to have settled the point in favour of Bacon, of whom he has given some interesting biographical notices. The birth-place of the Franciscan is generally believed in England to be Ilchester, but Caesemaecker appears to have proved that it was Anzin, the ancient French Hainault, and that, consequently, this distinguished man was a Walloon. The Flemings claim the discovery, however, for several others, but particularly Nicolas Bullet and Oliver Hemelveerdegem.

Generally speaking, the employment of glasses, and the choice of the particular form of glass, is left to the public and the optician; they are subjects on which the former think they are quite sufficiently instructed to judge, and the latter, for arguments to which human nature generally gives way, see no reason to undeceive them. At

(*a*) *Aenteekening van verschillige merkwaerdigheden over de Brillen en verdervn Zienglazen, en over de Oogziekten in-en omtreeks de stad Gent.* 1845. 8vo. pp. 36. See also notice of it in the September Number of the *Annales d'Oculistique*, 1846.

the present time this is a subject of very great importance, and demanding a much more lengthened notice of it than a report of this nature could afford; we purpose, however, ere long, to draw the attention of our readers to it in a more prominent manner. In those days of forced education on the one hand, when unhappy children are compelled, both by parents and teachers, to pore over books, often of very small type, and other objects requiring accurate vision, for hours and hours together, with the head bent, the shoulders stooped, the abdomen compressed, and the legs often dangling in the air, in crowded, badly illuminated, and ill ventilated apartments;—when young ladies in the upper circles, and those girls in the middle ranks who are preparing to be governesses and teachers, are obliged to "practise" and *read* music for five and six hours a day;—when young gentlemen are induced, either by threats or emulation, to read for eight and ten hours a day, and in addition several hours of the night, under the glare of a strong gas light, in order to uphold the character of a school or master, at the risk—often at the expense of sight and life;—when, on the other hand, unfortunate tradesmen are compelled by low wages, the high price of provisions, and scarcity of work, to support their almost starving families by working in dark, damp cellars and garrets for fourteen or sixteen hours a day:—and when poor seamstresses and milliners are necessitated by the fashionable luxuries of the upper classes to work for no less than eighteen hours out of the twenty-four;—and when we add to this the various factories and private trades which require the continuous application of the eye to minute objects, we wonder not that near-sightedness and impaired or altered vision should be now so common amongst us(*a*). There are certain questions connected with these states of impaired vision on which opinions are divided; but there are others, particularly with regard to the early employment of glasses, and the endeavour, if possible, by general treatment, and regulation of the health and occupation, on which there is no diversity, and with which patients, parents, teachers, and guardians, should be acquainted.

Dr. Sichel, of Paris, has for some time past examined into this subject with great energy and ability, and devoted a public lecture, once a week, to the consideration of the various states of impaired vision, the pathological changes which take place in such, and the proper description of glass applicable to each. The substance of these lectures has been given in Dr. Cunier's Journal in the early part of last year(*b*); as they have not yet been completed, we can only here refer to them; those that have already been published contain the most philosophical view of the matter which we have yet read.

In 1840 a very interesting tract was published, at Goettingen, by Professor Arnold Berthold, on the cure of short sight, by means of an

(*a*) See our remarks on the subject in the Lancet for April, 1845.

(*b*) *Leçons cliniques sur les Lunettes et les etats pathologiques consécutifs a leur usage irrationnel.*

apparatus which he denominated a Myopodiorthoticon, being a desk so arranged and capable of being so adjusted that the myop, by gradually and steadily increasing the focal distance, so alters or educates the sight that, in a short time, it becomes so much lengthened as to enable the individual to read at the ordinary distance(*a*). The fact of certain trades and occupations producing myopia is already well known, and the following fact tends to prove, that as this peculiarity has been acquired, so may it be lost under particular circumstances. During the days of press-gangs, tradesmen of every description, many of whom were short-sighted, were compelled to enter the navy, and, at the end of eighteen months or two years, from the alteration of occupation, and from constantly exercising the eye on distant objects, the great majority of those who had had impaired sight, acquired normal vision.

The latest, and indeed the only modern work in English, has just appeared from the pen of Mr. W. W. Cooper(*b*); it is written in a clear and rather popular style, and fully achieves the object for which it was intended, that of "imparting information upon points concerning which all medical men are expected to be well informed, and which are by no means devoid of interest to the general reader." In cases of myopia, the result of over application of the eyes, he very justly states that spectacles are absolutely injurious: "They afford, it is true, the means of discerning distant objects, but they tend to confirm the disorder, and render the individual dependent upon artificial aid for the remainder of his life. The course which ought to be pursued is plain; the patient should abstain from study, and all pursuits requiring close application, and he should endeavour, by due and well-regulated exercise of the eyes, in the country if possible, to recover that adjusting power of which, by injudicious exertion, he has deprived them." We recommend Mr. Cooper's little work to our readers, and would particularly direct their attention to the chapter on the use of glasses, and on the effects of artificial light. We are glad to perceive, that the subjects contained within the heading of this notice are beginning to receive the attention they deserve; and rejoice to find our able cotemporary, the Medico-Chirurgical Review, has already occupied its pages with them. When Dr. Sichel's lectures have been completed, we shall again take up this subject. In the meantime, we would refer our readers to consult, in addition to those works enumerated in the foregoing observations, Dr. Mackenzie's book on the Philosophy of Vision, and his admirable tract on "Asthenopia or Weak-sightedness," published in the Edinburgh Medical and Surgical Journal, in 1843.

(*a*) *Das Myopodiorthoticon oder der Apparat die Kurzsichtigkeit zu heilen.* Von Professor A. Berthold. Göttingen.

(*b*) Practical Remarks on Near sight, Aged sight, and Impaired Vision; with Observations upon the Use of Glasses and on artificial Light. By William White Cooper, Senior Surgeon to the North London Ophthalmic Institution. London: Churchill, 1847.

AFFECTIONS OF THE INTERNAL TUNICS, DIOPTRIC MEDIA, AND SENSITIVE APPARATUS.

Before we advance further in our Report, we may here remark that, independent of the new and original matter which we have quoted throughout this essay, and which was collected from a most extended field, there have also appeared several valuable lectures, crititical and historical dissertations, and records of cases in the different periodicals during the past year; but as such afford nothing new, nor of practical import, more than what was already known upon the subject, we have not quoted from them. Among these we may mention Historical and Critical Remarks upon the Operation for Cataract, by Mr. Watson, of Edinburgh(*a*); Doctor Jacob's lectures and papers on inflammatory and other diseases of the eye(*b*); Mr. Brett's Clinical Lectures at the London Western Ophthalmic Institution(*c*); various reports of cases and classification of ophthalmic diseases in the Provincial Medical and Surgical Journal, Mr. Hayes Walton's observations in the Medical Times, and numerous papers in the *Annales de Oculistique*, the *Gazette Medicale*, and the *Journal des Hopitaux*, &c.(*d*)

Cataract.—In a thesis, lately published by Dr. Edward Jäger, son and assistant to the celebrated professor in the Josephine Academy at Vienna, he has given the statistical results of his father's cataract operations. We have long been acquainted with the sensitive feelings which have actuated our distinguished friend in delaying to give the results of his experience to the world.

From the long experience acquired in the school of his illustrious predecessor and relative, Beer; with his own immense practice, both in public and in private, for many years past; from the very position which he occupies in the Viennese school, and from his acknowledged fame and success as an operator, the profession naturally expected something more at his hands during the last twenty years, than a few *brochures*, and some minor detached papers in the periodicals. We do not believe there is any European oculist who has so frequently extracted cataract as Frederick Jäger, and we therefore receive this little work of his son's, "*Uber die Behandlung des Grauen Staares*, Wien, 1845," with no small satisfaction.

From 1827 to 1844, Professor Jäger operated upon 1011 cases of cataract, of which there were

Lenticular,	764
Capsulo-Lenticular,	207
Capsular,	40

(*a*) See the Edinburgh Medical and Surgical Journal for January and April, 1846, pp. 57 and 347.

(*b*) Dublin Medical Press.

(*c*) The Lancet for October 31 and November 28. In the latter Number Mr. Brett has given a graphic illustration of a mode of performing artificial pupil, by means of a *lancet*, which is plunged into the aqueous chamber. We would recommend the study of Jungkins' *Atypes Operationes*.

(*d*) Provincial Med. and Surg. Jour., Dec. 9, 1846, p. 585.

On these he has performed the following operations:

Superior extraction,	728
Inferior extraction,	9
Partial extraction,	58
Depression,	129
For absorption,	87

Of this number, sixty-three cases were unsuccessful. By the following table we learn the proportion of unsuccessful results, consequent upon each of these different modes of operation:

In 58 partial extractions,	3
In 737 complete extractions,	33
In 87 breakings up,	6
In 129 depressions,	41

From this it appears that in Jäger's hands, at least, or when skilfully performed, the happiest results will attend the extraction. The proportion of those who have irrecoverably lost their vision, to those who have been successfully operated upon, are, in extraction, $4\frac{1}{4}$; in depression, 16; and in breaking up, 8 per cent(*a*).

We have already, in another publication, described Jäger's various methods of operating, to which we would here refer our readers(*b*); but as Dr. Edward Jäger's little work has not yet reached us, we here quote from our Parisian contemporary. When, however, we receive the work itself, we shall again take up the subject. In the meantime we may remark, that we think the statistical results have been given in too round numbers; for instance, many of these cases must have been partially successful, and many of the extractions have, to our own knowledge, terminated in closed pupil, which were subsequently mended by artificial pupils; again, there is a deficiency in these statistical results in not explaining the amount of vision attained and the causes of failure; for, although we may presume that inflammation has been the chief cause, yet, no doubt, others assisted.

Mr. W. W. Cooper has lately figured and recommended "a new cornea knife," the object of which is, by its shortness, not to prick the caruncula lachrymalis, and, by its having a blunt shoulder, not to cut the edge of the lid. The first of these indications was, we think, achieved by Mr. Tyrrell's improvement and modification of Beer's knife, and as to the second, we must say it has never occurred in our own, nor have we ever seen it take place in the practice of any other operator(*c*).

On the immediate Removal of Traumatic Cataract.—In large ma-

(*a*) *Archives Generales de Medecine*, No. xlvi., p. 477.

(*b*) Austria, its Literary, Scientific, and Medical Institutions. Dublin: Curry, 1843.

(*c*) From Mr. Walton's observations in the 569th and 572nd Numbers of the Medical Times we would willingly quote, did space permit, as they contain some very useful practical information.

nufacturing communities, wounds of the lens, by means of sharp pieces of iron or cutting instruments, are very frequent. In such accidents the offending body generally penetrates the anterior chamber, and often the wound of the lens takes place through the iris. This generally occurs from injuries by a sharp-bladed penknife, or a fork; in which case the instrument is instantly withdrawn; but it sometimes happens that small spiculæ of iron, or even portions of a copper percussion cap, penetrate the cornea, and either stick in the lens or fall into the anterior chamber. Although such accidents are occasionally met with in this city, in the generality of cases we find that the wound of the crystalline body has been produced by thorns penetrating the cornea and lodging in its substance. If no further injury has taken place, inflammation is immediately set up in the lens, and it is astonishing in what a short space of time it will become opaque, and present all the characters of cataract. In addition to this it sometimes happens that immediate partial dislocation forwards takes place, the aqueous fluid having been lost through the aperture made by the cutting instrument, in which case the lens presses the iris against the cornea or rupture of the capsule, with fracture of the lens itself occurs, when portions of it may be seen bulging through the pupil, or even projecting into the anterior chamber. Subsequent inflammation and opacity follow, the inflammation in many cases engaging the deeper seated textures of the eye; to this succeeds synechia posterior, and very often closed pupil, the substance of the lens being in many cases absorbed, and the opaque capsule remaining. In some instances, particularly where dislocation has taken place, and the iris and cornea remain in contact, the opposed serous surfaces of these membranes adhere at the place where the opening into the former occurred, and so we have synechia anterior, and permanent blemish. To meet the urgent symptoms of this case the usual depletory and antiphlogistic treatment is resorted to, rest, low diet, the abstraction of blood, and the use of mercury, &c., together with dilatation of the pupil by belledonna. But the case generally ends in permanent cataract, and frequently in closed pupil in addition. There are cases of injury, in which the lens, either whole or in fragments, becomes dislocated, but this we shall consider at another time; the latest information, however, connected with this subject, has been afforded us by Dr. Walker, of Manchester, already so favourably known by his practical ophthalmic works. Barton and Gibson, many years ago, recommended the extraction of the lens, under the circumstances just detailed, but with the ordinary Beer's knife. Mr. Walker has invented, and kindly furnished us with a "grooved needle knife,"

of which the accompanying woodcut is a *fac simile*, and which was described in the Medical Times(a). With this knife he penetrates the

(a) The Medical Times, vol. xiii., pp. 107, 127, 135.

cornea, and pushes it at once through the pupil into the substance of the inflamed and softened lens. Shortly after we received Mr. Walker's gouge-knife, the following case presented itself, and as it exemplifies its use and mode of application, we here insert it, as reported by Mr. Doherty. A man aged 32, by trade a stone-cutter, was admitted into St. Mark's Hospital on the 24th June last, labouring under violent inflammation of the left eye, which, he states, was struck four days previously by a sprawl or splinter from a stone which a fellow-labourer was dressing. He suffered no pain at the time of the accident, but was instantaneously deprived of sight in that eye. In twenty-four hours from the receipt of the injury pain set in, which continued to increase until the following day, when it became excruciating. He applied at an hospital, where he was cupped, and had belladonna applied round the eye. Upon admission into the Ophthalmic Hospital his symptoms were as follows: severe pain in the eye, extending to the brow; extensive inflammation of the conjunctiva, and some vascularity of the sclerotic; profuse lachrymation, with occasional paroxysms of a "gush of hot, scalding tears." There was no appearance either on the cornea or other textures of a wound, or any breach of surface, and the cornea was perfectly clear; the iris greatly dilated and bulged forward into the anterior chamber, by the lens, which had become dislocated and partially broken and softened, so that by its overlapping the iris in some parts it gave the pupil an irregular and deformed appearance; the lens itself had become quite opaque, and of a light greyish colour; there was total loss of vision in the affected eye. He had, in addition, considerable fever, quick pulse, hot skin, great thirst, constipated bowels, and complained bitterly of loss of rest. His treatment consisted in cupping the temporal fossa, blistering the temple, which was subsequently dressed with mercurial and belladona ointment, and evacuating the bowels; in addition to which he was placed upon the use of mercury, in the form of calomel and opium, together with complete rest and the use of opiates at night to procure sleep and relieve the pain. Upon the 28th his mouth was affected, and the quantity of mercury lessened: symptoms as before. Upon the 30th the eye was found to be somewhat less inflamed, but the appearances in the anterior chamber just as before, and the pain complained of as being just as excruciating as ever. The extraction of the lens was, therefore, resolved upon, and immediately performed, in the presence of Dr. Thompson, of the Omagh Infirmary, Dr. Hughes, of Jervis-street Hospital, and other medical gentlemen. The gouge-like knife of Mr. Walker was introduced with the grooved side forward, at the lower and outer side of the cornea, pushed into the centre of the lens, and through the posterior capsule. The effect was instantaneous. The aqueous fluid and the opaque and softened lens were immediately discharged along the groove in the knife. This caused but very trifling pain, and was followed by immediate restoration to the perception of as much light as enabled the patient to distinguish large objects passed

before him. The pupil became partially cleared, and large flocculi of the grey matter of the lens floated through the aqueous chamber. Within two hours after the operation the patient experienced "the greatest possible relief." July 1st, the report is:—Slept better last night than since his admission; no pain whatever; conjunctiva still very much inflamed; wound of cornea healed; iris fallen back; pupil more regular and contracted; the opacity within the pupil much less, being apparently caused by portions of the rent capsule; sight improving. 2nd July.—No pain; can distinguish his fingers; pupil quite regular; some small particles of the lens and capsule lying in the anterior chamber; inflammation of ocular tunics less; the mercury to be omitted and Peruvian bark substituted. Under this treatment, and the use of nutritious food, all the symptoms rapidly improved. On the 8th all the flocculi that floated through the aqueous fluid had disappeared, and nothing remained but the portions of opaque capsule. 12th.—"Sight nearly as good as ever:" inflammation almost gone, no pain, nor any uneasiness; capsule disappearing: left the hospital next day. This case must be exceedingly gratifying to Dr. Walker, for we are convinced that if the cataractous lens had been allowed to remain as it was, and gradually absorb, the immediate relief, and subsequent rapid restoration to sight, would not have taken place.

In one of the late numbers of the Milan Gazette, we find an interesting account of the *post mortem* examination of an eye, from which a cataractous lens had been extracted six years previously. The patient was aged 96, and had very good vision of the eye up to the day of his death. In the cornea the only abnormal appearance discovered was a slight sinking along the line of incision. The iris was natural, the vitreous substance and retina quite perfect; the uvea was somewhat lighter in colour; and the choroid is said to have been found marked with stripes of a grey hue, and in some places to present a more mottled appearance than the healthy eye. All these appearances in the choroid, however, are frequently remarked in extreme old age.

On the Use of Glasses in Cases in which the Operation for artificial Pupil has been employed.—In a case in which a marginal artificial pupil (*Iridectomodialisis*) was performed by Dr. Guaglino, he says, after ten days the patient, a woman aged forty, and previously blind of both eyes, could only distinguish large objects: and adds, "I knew that in the course of time her sight would have gradually improved, and I tried only to augment the refractive power of the margins of the cornea and the crystalline body by applying a glass, slightly convex, to the operated eye. The improvement was so sensible that the patient wondered at it, and could scarcely believe the objects she saw were really such. She could distinguish the title of a book and the chain and drops of a watch," &c.(*a*) The success of the case was by this means rendered more brilliant, and in similar instances the application of lenses is worthy of imitation.

(*a*) *Gazetta Medica de Milano.*

Following up this inquiry, we find in the same periodical from which the above is quoted the following notice:

In the beginning of last year a letter was addressed to the Medico-Chirurgical Section of the Society for the Encouragement of Science at Milan, by Dr. A. Trinchinnetti, containing a *proposal for the employment of a medium to render more efficacious the operation in some cases of artificial pupil.* It is well known that the amount of vision acquired after the operation for artificial pupil varies according to the circumstances of the case and the position of the newly-formed aperture in the iris, or altered position of the natural pupil. A central pupil, when the cornea will admit of it, is said to be most serviceable: marginal pupils are less so, and that for many obvious reasons: a difficulty is experienced by the person so operated upon in directing the eye in such a way that its axis may approach the axis of vision; moreover, the rays of light entering at the margin of the pupil must of necessity pass through the cornea at a point where it is less convex, and these rays then pass through the lens, nearer to the periphery than in its normal state, and, consequently, where the refractive power is less than in the centre. "I therefore imagined," says Dr. Trinchinnetti, "that a convex glass applied opposite the eye might compensate for this deficiency in the cornea and lens, and my expectations were realized in the following case." In November, 1845, a young man was rendered blind from ophthalmia, the consequence of an explosion of a mine. Both corneæ were opaque; in the left the lens was cataractous; the iris (naturally blue) had in this eye become of a greenish hue, mottled with yellow specks; there was, however, a distinct perception of light. Iridectomia was, therefore, performed, and turned out successfully; the eye remained closed up for eight days, at the end of which time it was examined, and a good triangular pupil was found to exist. At first the newly acquired vision was very inconsiderable, but in the course of a fortnight it improved so much as to enable the patient to perceive distinctly all large objects shewn to him. I then," says the author of this memoir, "tried the application of convex glasses, having always been of opinion that in such cases they might be exceedingly advantageous; and my satisfaction was very great when I guessed, by the smile of the patient, when looking around him, that he could see every thing clearly." With glasses number 4 the patient was enabled to read moderate sized print.

Artificial Pupil.—The various methods devised by oculists to produce an abnormal aperture in the iris are detailed in most works bearing on ophthalmic medicine, as well as in those which are devoted to the consideration of general surgery. There is one method of operating, however, with which English surgeons do not seem to be acquainted. It is that of dislaceration, as it is termed by the Germans; this is applicable to cases of cataract combined with closed or attached pupil (synechia posterior), and consists in opening the cornea, and with a sharp-pointed iris-hook introduced through

the aperture, tearing the iris from its lenticular attachment. We have seen Jäger perform this operation, and he introduced his triangular knife so deep that he also punctured the lens and iris about the situation of the original pupil, and with the hook detached the iris from the lens. The result was not as favourable as was expected, because the lens itself was opaque, and required a subsequent "drilling" for its removal.

At the meeting of the French Academy of Medicine, for the 21st April last, Dr. Robert read a paper upon this subject, and stated that, in many instances of synechia posterior, the capsule and lens remained transparent, and that the closure of the pupil is caused by a false membrane unconnected with the lens, in which case the ordinary mode of artificial pupil resorted to in this country, of cutting through both cataract and iris, by means of a small knife passed in through the sclerotic, as practised by Cheselden and Adams, would be quite unnecessary. Cases of atresia aridis, the result of internal inflammation, or following operations, are very common in these kingdoms; but, as far as our experience goes, the centre of the capsule of the lens is, in such cases, so much thickened and altered by disease, that the proposal of M. Robert would be inefficacious. In such cases we should much prefer detaching the iris from its ciliary margin, if we were sure that the circumference of the lens or capsule were unaffected(*a*).

Injury of the Iris.—Mr. Dixon, one of the surgeons of the Royal Ophthalmic Hospital, lately brought forward a case at the Medico-Chirurgical Society, of a woman who had received "a blow with a fist" on the left eye. The lids became swollen, and she suffered great pain, but did not apply for medical advice until eight months after, when Mr. Dixon found the cornea "clear, but all behind it was dark, and no iris visible." Just behind the upper edge of the cornea, a mark, about half an inch long, somewhat like a cicatrix, and mottled with three or four dark spots, was found to exist. The light was painful, but vision was greatly impaired. Mr. Dixon says that he could "distinctly see the surface of the retina," and that, by the catoptric test, he discovered that the lens was also wanting.

The figure of the globe was scarcely altered, and with a peculiar adjustment of glasses she could read brevier type. "It appears probable, therefore," says Mr. Dixon, "that the blow which she received ruptured the coats of the eye, and at the same time completely detached the iris from the ciliary ligament; that the lens was dislocated, and escaped, with the iris, through the wound; and the rent in the sclerotic had afterwards healed up." Without having seen this case it is difficult to offer an opinion upon it, and we should be sorry even to appear to differ from so eminent an authority; but without at all discussing the probability of the iris and lens being torn out by a violent blow, from an eye which could present, eight months subsequently, the appearance which this did,—we may mention the following fact; when the iris is *completely* paralysed, there is great difficulty in discovering it at all, and of this we have assured ourselves from observing several examples of it. We were twice shewn eyes from which we were informed the irides had been torn out by accident. Upon a very minute examination, however, we discovered a small trace of the iris, not quite half a line in breadth, at the inferior margin of the cornea. In both of these, it had been supposed that the sclerotic was wounded, but both patients persisted in declaring that they never had such a wound, nor did any appear; one had been struck with a briar, the other with a piece of turf(*a*).

(*a*) See Medical Times, May 2, 1846.

In the last volume of the Medico-Chirurgical Transactions, Mr. Dixon has recorded the history of a case of great interest, both in a practical and physiological point of view, in which a large tumour was developed in the substance of the fifth nerve and its ganglion.

What gives value to this case is the length of time for which it was observed, and the accuracy of the *post mortem* examination, which latter is illustrated by a lithograph the size of nature, which shews the character and appearance of the morbid growth.

The patient, a woman aged 59, was first attended by Mr. Dixon, in October, 1844, for dimness of sight in the left eye. On that side the fifth nerve had completely lost its sensitive and motary function. In December inflammation of the eye set in, lymph was effused into the anterior chamber, and the pupil became closed. Subsequently the external rectus and levator palpebræ, as well as all the muscles supplied by the facial nerve, became paralysed. There was also total deafness of the left ear, and complete want of smell in the left nostril. She died in February, 1846. Upon examination, the brain generally, and all the nerves upon the right side, were perfectly healthy. A large lobulated mass was found attached at the junction of the pons varolii and crus cerebelli. "This tumour, from which the three divisions of the fifth nerve emerged, had hollowed out for itself an irregular pit in the concavity of the great wing of the sphenoid cone. The glosso-pharyngeal, vagus, spinal accessory, and lingual nerves were unaltered." It proved to be a degeneration of the trunk of the nerve and the Gasserian ganglion. The eyeball was as large as the right one; the sclerotic was of a natural thickness; the choroid of a reddish brown, with scarcely a trace of black pigment; the vitreous humour natural; the lens of a pale yellow colour, and opaque in the centre. The iris adhered to the middle of the lens, and the uvea was as black as usual; the cornea was but slightly opaque. Mr. Dixon's observations on this case will be read with interest(*b*).

Luminosity of the human Eye.—Some observations on a luminous appearance of the human eye, and its application to the detection of disease of the retina and posterior part of the eye, have been

(*a*) London Medical Gazette, December 4, 1846.
(*b*) Medico-Chirurgical Transactions, vol. xxix. p. 131.

published by Mr. W. Cummin, in the last volume of the Medico-Chirurgical Transactions(*a*). We have repeated some of the experiments detailed in this paper, but have not been fortunate to produce all the appearances detailed; at the same time we are free to acknowledge that some of our experiments were objectionable. But while we are not prepared to go the lengths which this gentleman does in his statement, we think it but right to insert the following good analysis of his paper from the London Medical Gazette :

"The author mentions the well-known luminous appearance of the eyes of cats, dogs, and other animals, the reflection from the eyes of albinoes, &c.; and after quoting from the works of Muller, Beer, and Tyrrell, as to other cases in which reflections have been observed from the posterior part of the human eye, proceeds to say, that the object of the present paper is to shew that the healthy human eye is equal, or nearly equally as luminous as the eye of the cat, &c., when observed under favourable circumstances; and the application of the alteration or loss of this luminous appearance to the detection of changes in the retina, and posterior part of the eye.

"The author states, that the reflection may be seen in the following manner: Let the person whose eyes is to be examined be placed at the distance of ten or twelve feet from a gas or other bright light; the rays of light must fall directly on his face, all rays falling laterally of the head must be intercepted by screens placed half way between the light and the eye examined. If the reflection be bright it will be at once seen from any spot between the light and the screen.

"The author having more particularly described the mode in which the observations brought forward in this paper were made, remarks:—The luminous appearance varies from a dingy red to a bright silver or golden tint, in some cases of extreme lustre, equalling that of a well ignited coal. It is more brilliant when seen at several feet distant. It was always seen when the eye was healthy and the pupil easily dilated. The reflection was seen in cases in which the lens had been removed by the operation of solution. Twenty cases were examined indiscriminately, vision being perfect in all, the age varying from a few months to sixty years. In sixteen cases the reflection was bright and very evident, in four faint, and seen with more difficulty, and in one it was not seen.

"As to the cause of this reflection, it is attempted to be shewn, that the retina, although a perfectly transparent medium in the living eye, is still a reflecting body. The formation of images upon the retina, the reflection from the cornea and lens, and other transparent bodies, are cited as proofs of this. Other circumstances would increase the brilliancy of retinal reflection—viz., the concave shape of the retina itself, the position of the lens, the influence of the vascular anterior layer of the retina filled with red globules of blood.

(*a*) Vol. xxix. p. 282.

"The author remarks, that the establishment of the fact of a similar reflection from the healthy human eye to that from the eyes of other animals, appears important in two ways. First, as a physiological fact, it shews that too much influence has been ascribed to the tapetum, that of the retina being entirely overlooked. Secondly, in a pathological view, the existence of this appearance in the healthy eye having been recognised, its non-existence, or alteration, may enable us to detect changes in the condition of the retina and posterior part of the eye heretofore unknown, or satisfactorily to see those which we only suspected."

There are certain states of the retina in which it becomes not only visible, but presents a brilliant metallic appearance, not unlike that seen in the commencement of malignant disease, even when examined with the naked eye in an ordinary natural light. The subject is worthy of much longer consideration that we are at present able to devote to it.

Malignant Diseases.—Little has been added of late years to our knowledge of the malignant diseases of the eye-ball; and although the following cases offer no exception to this statement, still as there are many points connected with the propriety of an operation undecided, we here record them, as affording a portion of that material which, when properly arranged, shall in time assist to decide the question. Messrs. Page and Gibb have recorded two cases of this nature. In Mr. Gibb's case, a man aged 50, the disease appears to have been true scirrhus, forming a hard, pearly-looking mass, which completely filled the orbit, and projected from between the lids. The remains of the eye were intimately incorporated with this structure: it was removed by Mr. Greenhow at the Newcastle-on-Tyne Infirmary, when it was found that no trace of the optic nerve could be detected. The point of most interest connected with this case is its history. The disease is traced back to a period fourteen years previously, when it was attacked with violent inflammation, from exposure to cold. During the next four years the man had several accessions of inflammation, and the eye became completely blind, but not in the slightest degree altered in shape or colour for three years subsequently. After this it is reported that a portion of the iris and cornea were removed, but for what it is not stated. Since then the eye-ball protruded, and he was attacked with violent orbital pain(*a*). It would very much contribute to the value of cases in which the eye-ball has been removed for malignant disease, if their subsequent history could be obtained.

Mr. Page's case was a woman aged 76, who, as in the former instance, had suffered from previous attacks of inflammation for a considerable length of time before either vision was impaired, or the eye enlarged or protruded. This appeared to be a case of true scirrhus; a small, hard, firm tumour was attached to the sclerotic, and overlapped the lower portion of the cornea. The tumour had

(*a*) Provincial Medical and Surgical Journal for June 24, p. 280.

pressed into the interior of the eye. On the 28th of April, 1845, the globe and tumour were removed with immediate relief to all the patient's suffering. A section of the tumour proved it to be of a scirrhous nature with portions of melanotic matter scattered through it. The woman died in the December following, but no examination was obtained(*a*).

At a recent meeting of the Manchester Pathological Society, Mr. Wilson exhibited a melanotic eye-ball which had been removed from a woman aged 52, but the final result of this case is not known(*b*).

Concluding Observations.—We find that the great magnitude of this subject, and the necessarily limited space which can be devoted to such a Report in a periodical where so many other subjects have to receive a certain degree of prominence, prevents our continuing and concluding it in the manner in which we had intended at the commencement. We can only now enumerate the most prominent articles which have appeared in the various periodicals, on the subject of ophthalmic medicine or surgery, during the past year; and thus we hope to fulfil the two-fold object intended in this essay,—that of affording those, whose time or occupations do not permit of their wading through a great variety and an immense number of works, an abstract or retrospect of a particular branch of science, in the same manner as our admirable contemporaries, Braithwaite and Ranking, do for medicine at large, and also acting as a reference or *catalogue raisonne* to the progress of ophthalmic surgery for a twelvemonth. In endeavouring to fulfil this task, we have, no doubt, committed many omissions, but we can assure those who may think their papers have been overlooked that the omission was most unintentional.

Among the cases and practical remarks lately recorded, we would specify an instance of destructive inflammation of the eye after phlebitis consequent on amputation, related by Mr. W. Bowman, one of the surgeons of the London Ophthalmic Hospital. The *post mortem* examination of this case, and Mr. Bowman's remarks, have in no small degree enlarged the boundaries of ophthalmic pathology(*c*).

The *Gazette des Hopitaux* of last year contains several interesting notices on syphilitic purulent ophthalmic, by M. Ricord, in which he recommends continual inunction of belladonna round the orbit. Cases are related by Velpeau and Furnari, to shew the little effect which the vitreous humour exercises in comparison with the aqueous in the absorption of cataract. Furnari, whose work we noticed at the commencement of this Report, has written to prove that the membrane of aqueous humour, or that denominated on the Continent the membrane of Descemet, was known to the Arab physician, Ali Ben-Isa, in 885. Sichel and Schoerer have likewise contributed many valuable contributions to this periodical(*a*).

(*a*) Provincial Medical and Surgical Journal for May 6, 1846, p. 205.
(*b*) London Medical Gazette, Jan. 1, 1847.
(*c*) London Medical Gazette, October 30, p. 754.

The number for the 15th of September contains a lengthened article on nictalopia, to which we would particularly direct attention. The Provincial Medical Journal for April last contains a notice of two cases of hemeralopia, also of considerable interest; and the same periodical gave an account in August last of a family in which, for three generations, the males only were affected with congenital cataract.

The *Gazette Medicale* is likewise exceedingly rich in ophthalmic communications, of which we have already taken advantage.

In the Number for 14th of February, M. Munchmeyer de Verden calls attention to the value of calomel applied to the conjunctiva in inflammatory diseases of the eyes, as originally recommended by Fricke. He says, that not only in severe catarrhal ophthalmia, but even in inflammation following operations, he has found it most beneficial, and in scrofulous ophthalmia with photophobia, he looks upon it as a specific.

Paleotte recommends the use of hydriodate of potash and ammoniacal frictions to the forehead as a cure (?) for cataract. In the *Journal für Chirurgie und Augenheilkunde* will be found a very lucid essay upon conical cornea, by Professor Von Walther, of Munich.

Mr. Wharton Jones's work on ophthalmic medicine and surgery not having yet reached us, we are unable to make any extracts from it; we shall, however, notice it in our next Number, along with those recent Numbers of the Ophthalmic Annals which our space does not now permit of our applying to the purposes of this Report. These latter contain most valuable contributions from Sichel, Cunier, Hoering, Decondé, Stievenart, and others.

We should feel obliged for all Reports of Ophthalmic Institutions and Blind Asylums.

(*a*) *Gazette des Hopitaux* for May 23 and 28, June 13, July 14, July 25, and July 28.

REPORT

ON THE

PROGRESS OF OPHTHALMIC SURGERY

FOR THE YEAR 1847.

BY

W. R. WILDE, M.R.I.A.,

SURGEON TO ST. MARK'S OPHTHALMIC HOSPITAL.

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REPORT

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PROGRESS OF OPHTHALMIC SURGERY,

FOR 1847.

With Original Cases and Illustrations.

By WILLIAM R. WILDE, M.R.I.A.,

SURGEON TO ST. MARK'S OPHTHALMIC HOSPITAL.

THE only special works upon ophthalmic surgery which we have received since the publication of our last Report, are Mr. Jones's Ophthalmic Medicine and Surgery(*a*); the American edition of Mr. Lawrence's Treatise on the Eye(*b*), with the illustrations, notes, and additions of Dr. Hays, of Philadelphia, making it one of the most complete works of the kind in our language; and M. Desmarres' *Traite des Maladies des Yeux*(*c*). To these we shall refer in the course of this Report.

Of the *National Peculiarities* of the eye we have spoken at some length in our Report last year; and we have not much to add on the present occasion. In Colonel Hamilton's Smith's interesting work on the Natural History of the Human Species we find a plate illustrative of this subject, showing the form of the eye-lids in four different races, with this description:—"Those from Canton northward and westward have the gland of the eye covered by the lid and eye-lash turning over it, which increases to its maximum among the black Kalmucks, whose eyes are turned obliquely downwards more than any other race, and whose skin is not yellow, but

(*a*) A Manual of the Principles and Practice of Ophthalmic Medicine and Surgery. By T. Wharton Jones, Lecturer on Anatomy, Physiology, and Pathology, at the Charing Cross Hospital, &c., &c. London, Churchill. 1847. Small 8vo., plates, pp. 570.

(*b*) A Treatise on Diseases of the Eye, by W. Lawrence, F. R. S., Surgeon Extraordinary to the Queen. A new edition, Edited, with numerous Additions and 167 Illustrations, by Isaac Hays, M. D., Surgeon to Wills' Hospital, Philadelphia. Philadelphia, Lea and Blanchard. 1847. pp. 859.

(*c*) *Traite Theorique et Pratique des Maladies des Yeux.* Paris, 1847. pp. 900.

ashy."(*a*) By the gland of the eye we suppose the author means the caruncle. We think the drawings, however, greatly exaggerated, particularly that of the Kirguise, where the internal angle of the upper lid is made to overlap the lower. The obliquity spoken of arises in part from the peculiarity of the orbits, but is chiefly owing to obliquity of the lids, and not to any irregularity of the globes.

CONGENITAL MALFORMATIONS.

In our articles upon this subject in the twenty-seventh and twenty-eighth volumes of the former series of this Journal, we enumerated among the defects of the lids and ocular appendages, the disease denominated *congenital ptosis:* and also *phymosis*, or congenital narrowing of the rima palpebrarum. During the past year we have had under our care two very remarkable instances of a peculiar modification of this very curious defect, of which the accompanying illustration affords some idea.

Both instances were adults, a male and female, with fair complexions, sandy hair, and blue eyes, and in neither was there any hereditary predisposition to peculiarity of this description. The globes were well formed, and their contents normal, and vision was perfect, though not very strong; but the eyes seemed sunken within deep cavities, and were scarcely touched by the lids. The idea presented to us at first sight was that of a piece of integument, with apertures cut for the eyes, stretched tightly over an osseous preparation, as the globes made little or no prominence externally. The brows were natural, but deeply-arched and elevated, from the action of the frontal muscles, by which alone the palpebræ were elevated. The upper lids were remarkably small, smooth, and totally devoid of folds or furrows, and they appeared nearly flat from side to side, owing to the very slight projection of the globes. They usually covered the upper two-thirds of the corneæ, and consequently a considerable portion of each pupil, which, from the eyes being so much shaded from the light, was generally dilated. By the action of the occipito-frontalis muscle, the lid can be raised so as to uncover about one-third of the cornea. It is manifest that in these cases there is either total deficiency or complete atrophy of the levator palpebræ. The split of the lid is about half the natural size in the full-grown adult; the ciliæ are

(*a*) Explanation of the plates, p. 458.

natural, but light in colour, and the puncta normal. Without any eversion, both these cases suffered from redness and irritability of the inner edge of the lower lids, for about the depth of the Meibomian glands, owing to the action of the atmosphere upon the mucous surface, which stands out about a line from the surface of the globe. A slight lachrymal effusion generally fills this space. The orbicularis palpebrarum is tolerably well developed, enabling these persons to approximate the lids and close the eyes. From some flattening of the nasal bones and the small palpebral apertures, the eyes at first sight appear to be set too widely apart. Dr. Mackenzie says he has met with "a degree of depression of the upper lid so considerable as to materially impede the function of vision, and which had existed from birth; in some of these cases the lid was the reverse of being swollen; it rather appeared atrophic, as if the levator muscle had either been originally deficient, or had wasted from disease."(*a*)

Coloboma Palpebræ.—The accompanying illustration affords the best idea of a well-marked case of cleft eyelid which we have yet seen. It is taken from the right eye of a girl aged 14, with dark hair and eyes, none of whose family have had any congenital malformation. The split occurs at the junction of the middle and inner thirds of the lid. In this case we find that there is a complete deficiency in the cartilage, for about a line in breadth, throughout its whole extent; in fact, there are two distinct superior tarsal cartilages, held together by the conjunctiva internally, and the muscles and integuments without. The ciliæ are continuous, but somewhat shorter within the cleft. Upon everting the lid, the split is very manifest, and externally the finger sinks into the deficiency. She experiences no inconvenience from this peculiarity.

A gentleman of our acquaintance has precisely the same peculiar malformation, also in the right eyelid, and in exactly the same place, —the junction between the middle and internal third of the cartilage.

Megalophthalmus, or preternatural enlargement of the globe.—We are indebted to Mr. Fleming for a case of this description which fell under his notice in one of the temporary fever hospitals. The boy, now seventeen years of age, has brown hair, and dark hazel eyes. The right eye is natural in every respect; the left is nearly twice the size of the right, and very defective in vision, but perfectly natural, and to all appearance healthy in its coats and hu-

(*a*) Mackenzie on the Eye, third edition, p. 181.

mours. From all its parts being in proportion to one another, it presents one of the best instances of pure buphthalmia, or congenitally enlarged eye, which we have yet seen or read of. The pupil is perfectly sensible to light, and the lachrymal appendages normal.

A case of the *Congenital Absence of the four Puncta*, in a barrister in Paris, aged 25, has been related by M. Blanchet, who has succeeded in establishing a punctum in communication with the lachrymal duct upon the right side(*a*).

Scarcely a year passes that we do not read of cases of opacity of the cornea presenting at birth, and arising either from an arrest of development of this membrane during an early period of fœtal life, or the supervention of inflammatory action in it *in utero*, as we have already explained in our second essay upon the malformations and congenital diseases of the organs of sight(*b*). A case of *Corneal Opacity*, apparently the result of the former cause, and accompanied by deficiency of the iris, has been lately recorded by M. Tavignot, in a child eighteen months old. The globes were natural in size, but somewhat too spherical in form. There was convergent strabismus, with nystagmus, in both eyes. The corneæ were natural in size, but the left presented an uniform opacity, except around its sclerotic attachment, where there was a small transparent zone. In the right cornea the opacity occupied about one-third of its extent, and was confined to the centre. There was in this case some approach to that peculiar condition of opacity sometimes seen in middle and advanced life, and to which has been given the name of arcus senilis. The iris was almost totally deficient in both eyes. There was some vision, but considerable photophobia(*c*).

M. Desmarres, in his recently published work upon the eye, has devoted considerable space to the congenital deformities; but his knowledge upon this subject is chiefly derived from the celebrated work of Von Ammon, of Dresden(*d*), and he does not appear to be at all acquainted with the writings of Englishmen who have alluded to these vices of conformation.

Dr. Texon relates three cases of *Irederimia, or congenital absence of the iris.* In all there was partial ptosis, or a peculiar drooping of the upper lid, so as to cover a portion of the cornea, and thus act as a shade, like the lids of the chameleon. The bottom of the eye appeared dark brown or black, and in one case, in a strong light, there was seen deep in the eye a brilliant reflection, giving it a luminous red appearance, like a ruby(*e*).

Hereditary Absence of the Iris.—Dr. Stoeber, of Strasbourg, whose researches upon the congenital malformations of the eye we

(*a*) *Gazette Medicale* for 1st May, 1847.
(*b*) The Dublin Journal of Medical Science, vol. xxviii. for 1845, p. 89.
(*c*) *Gazette Medicale* for July 27, 1847.
(*d*) *Klinische Darstellung der Angebornen Krankheiten.*
(*e*) *Annales d'Oculistique*, January, 1848.

have heretofore had occasion to notice, has lately recorded an instance of iriderima in both the father and son. The child was two months old; the deficiency existed in both eyes. The same deficiency existed in the father, who from this cause was never able to read(*a*).

Mr. France has made a second notice of the case of *Iriderimia* recorded by Mr. Willesford in the fifteenth volume of the London Medical Gazette. The girl, now aged 17, has, it appears, lost vision since her case was originally published; owing, it would seem, to the sensibility of the retina having, by long exposure to too much light, become blunted. Mr. France gives the following statement of her appearance in June last(*b*):

"The girl's complexion, as before mentioned, is dark, and the hair, eye-brows, and eye-lashes, which are plentiful, are black. The globes are altogether ill-developed, perhaps two-thirds of the average size for an individual of this patient's age; they are affected with continual oscillatory motion; the openings of the palpebræ are short, but not disproportionate to the bulk of the eye-balls.

"The cornea of the right eye is much smaller than usual, its centre hazy, and the surface of the hazy part scabrous; the sclerotic, of much less capacity than ordinary, appears otherwise healthy, and possesses a due degree of tension. The iris is totally deficient, except towards the temporal side, where a narrow rudiment of the membrane exists, presenting a diameter of about a line at the broadest part, and extenuating itself to a point at either extremity; it thus constitutes a narrow crescent of light brown colour, the only septum between the chambers of the eye; for, with this exception, the entire space behind the cornea appears uniformly black.

"The cornea of the left eye is very small, with a nebulous centre, where the surface is irregularly flattened. The sclerotic is of corresponding size, but otherwise healthy. In this organ, likewise, the sole vestige of iris consists of a narrow, light brown crescent, confined to the temporal side; and the observer looks uninterruptedly through the remaining space to the dull, black fundus of the eye. In neither globe is there any appearance of cataract; yet in neither are the deeper reflected images of a candle discernible upon catoptrical examination; a circumstance owing, probably, to the irregularity and central haziness of the surface of the cornea. Intolerance of light is by no means considerable in the ordinary uninflamed condition of the eyes; but the patient continues subject to slight attacks of ophthalmia, productive of troublesome photophobia. Vision, which is most imperfect with the left eye, is sufficient to enable the patient to find her way about accustomed places, and to execute a little coarse work; but she cannot thread a needle, or pick up a pin from a light-coloured surface; and at dusk her visual powers are still more deficient. No other member of the family, parent or child, is similarly affected."

(*a*) *Gazette Medicale de Strasbourg.*
(*b*) Ophthalmic Cases in Guy's Hospital Reports, vol. v., for 1847, p. 30.

Congenital Amblyopia.—The peculiar optical defect which exists in Professor Airy's eye, and which he described in the Cambridge Philosophical Transactions some years ago, under the name of *Astigmatism*, has also occurred in the person of Dr. H. Goode, who has lately written an article on the subject. To remedy this defect it is proposed to use a lens plane on one side, and a section of a cylinder on the other. Glasses of this description are said to be best made by M. Chamblant of Paris, who also constructs lenses suited to Dr. Goode's eye, viz., with cylindrical surfaces, the axes of the two surfaces crossing at right angles(*a*).

Korestenoma.—Von Ammon has applied this term to that peculiar vice of conformation in which there is a preternatural projection of the iris within the circle of the pupil at any one part. It is one of the rarest forms of congenital malformation of the eye. In the fourth volume of that valuable periodical, the Quarterly Journal of Medical Science of Prague, we find an interesting account of a case of this description, by Dr. Victor Szokalski, accompanied by a well-executed illustration, from which the wood-cut here represented is copied. The subject of this malformation was a girl of a scrofulous constitution, born with hare lip, and said to be affected with syphilis. The irides were light blue, and in each iris was observed a light yellow stroke of a conical shape; it arose broad from the border of the pupil, and extended obliquely downwards and inwards to the ciliary margin. In the right eye, however, its upper edge formed a rounded, wart-like protuberance, which projected into the pupil, and occupied about half the size of that aperture in its moderately dilated state, and also extended into the anterior chamber. It was covered with minute hairs. The other parts of the eye were normal. While the ordinary discolouration of the iris, which this resembles, has been accounted for on the belief that it is an early cicatrix of this membrane, no plausible hypothesis has yet been advanced which will explain this peculiar fault in the formation of the ocular diaphragm(*b*).

A case similar to this is reported to have occurred in the practice of the venerable Walther of Munich. The fact of the case related by Dr. Szokalski having been mistaken and treated for syphilitic iritis with lymph effused on the surface and border of the iris is in itself a sufficient proof of the necessity of the profession being made acquainted with all these vices of conformation.

Mr. Allen has lately recorded the case of a cyclops monster, but he has omitted all notice of the dissection of the eye(*c*).

(*a*) Monthly Journal and Retrospect of Medical Science for April, 1848.
(*b*) *Vierteljahrschrift für die praktische Heilkunde* III., *Jahrgang*, 1846. *Vierter Band.* Prag.
(*c*) Lancet for February 26, 1848.

DISEASES OF THE EYE-LIDS AND LACHRYMAL APPENDAGES.

Ectropion.—We have very little to record on this subject. The following case, which we treated in the year 1844, by a new method of operating, possesses sufficient interest for its insertion here. The subject of the deformity represented in the accompanying illustration, a girl aged fourteen years, had a scrofulous abscess over the malar bone, near the edge of the orbit, when about five years of age. A small portion of bone had exfoliated; the integuments became inverted during the subsequent healing process, so that the skin and periosteum were intimately united. By this means the lower lid was drawn down from the globe, and its outer portion greatly everted. The conjunctiva presented the usual red villous appearance which it assumes when thus exposed for any length of time. When first examined we found the integuments so intimately attached to the bone, that it did not seem possible to insert anything between them. For upwards of a fortnight the patient, by our directions, rendered the parts more moveable by drawing the adjoining skin in different directions, so that some cellular membrane seemed thus to have been felted, as it were, between the bone and the thin layer of skin by which it was covered. A small narrow-bladed and double-edged knife, such as that used for the subcutaneous section of tendons, was then introduced at the distance of nearly an inch on the outer side of the cicatrix, passed obliquely down to the bone, then pushed forward to the outer angle of the attachment, at which period of the operation the parts both above and below the cicatrix were made as tense as possible, and stretched forwards, while the point of the knife, its flat surface being laid upon the bone, was moved in a semicircular manner from above downwards, and at the same time pushed forward, until the entire adhesion, and for nearly half an inch on each side of it, was fully detached from the bone. As soon as it was found perfectly free, and that the lid could be restored to its normal position, the knife was withdrawn, and the small wound closed with adhesive plaster. The effusion of blood which immediately took place beneath the cicatrix caused a tumour where the depression had existed, and care was taken that none of this blood should escape through the external aperture. A ligature was then passed through the lower lid, about a quarter of an inch from its ciliary margin, and the ends of it drawn up and attached to the forehead during the next three days. Cold applications were applied, and we had the satisfaction to find that, within a fortnight afterwards, the deformity was completely removed, the depression of the cheek filled up, and the lid

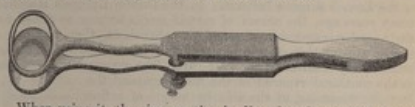
restored to its natural position. The thickened conjunctiva, however, required the application of the sulphate of copper for some time afterwards. At present it is scarcely possible to trace where the deformity existed. This case is not only interesting in itself, but the means by which it was removed afford us a valuable hint in the treatment of similar deformities elsewhere.

Follicular Tumour of the Caruncle.—The accompanying illustration affords a tolerably correct idea of this rare form of disease, which closely resembles benign encanthus. It occurred in a girl aged eighteen years when this drawing was taken, about two years ago. An oblong, fleshy mass occupied the internal angle of the right eye, projected over the commissure, and lay between it and the nose. Upon close examination it was found to be minutely lobulated on its surface; it was not very sensitive to the touch; and on raising it up and drawing it forward, it was found to be attached both to the lower edge of the caruncle and the conjunctival lining of the inferior lid; but that it was not a mere enlargement of the caruncle itself was manifest, from a portion of that body being distinguishable behind and above it: the second root was situated between the punctum and the extremity of the inner angle of the lids. The tumour was polished on its surface, and totally devoid of hair. The patient stated that the disease had existed for many years, but, except the deformity, gave her very little inconvenience till latterly. It used occasionally to bleed when rubbed, and she says it generally increased in size and depth of colour during the menstrual period. A fine ligature was passed over the tumour, and tightened as far down towards its root as possible, when the tumour assumed a purple colour instead of the bright, florid red which it previously exhibited. After a few hours the tumour was removed with a pair of scissors, at the line of strangulation, and scarcely any hæmorrhage ensued. Upon examination the tumour was found to be chiefly composed of conical eminences, formed of capillary blood-vessels, held together by loose cellular tissue, and covered by an unusually thick layer of epithelium. The resemblance which it presented to the microscopic appearance of condyloma was very remarkable. In the course of a twelvemonth it grew again, and was lately removed.

Anchyloblepharon.—In cases of adhesion of the lid to the globe, M. Dijon passes a lancet-shaped needle across the base of the cicatrix, as deep as possible, but parallel with the margin of the eyelid. Through this aperture he passes a piece of fine silver wire, the extremities of which he joins, and leaves this ring in for fifteen or twenty days, at the end of which time the trajet is free and its sides

cicatrized: he then cuts out the wire. It is found, he says, to answer the purpose perfectly.(*a*)

Tarsal Tumours.—In our Report for last year we mentioned that Dr. Desmarres had invented an ingenious description of forceps for the removal of tumours from the eye-lids, and we described the mode of using it. We stated, however, our objection to its use,—that it was only applicable to the removal of those little bodies by an external incision, a plan few operators will, we think, now agree to. We have, however, taken the hint from our Parisian contemporary; and had an instrument constructed on precisely the same principle, but modified so as to answer the purpose to which we apply it. It is here represented of the actual size.



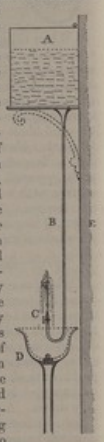
When using it, the ring portion is slipped under the lid, upper or lower, so as to encircle the tumour; the blades are then screwed together with the necessary degree of tightness, and the lid everted. By this means we have the lid fixed,—a perfect tourniquet applied, by which all hæmorrhage is prevented, and, in all probability, pain is lessened, the globe defended, and a point of resistance obtained in the solid blade of the instrument, by which also the tumour is pressed forward. Having opened the sac freely, we turn out its contents into a fine silver spatula, or a Davielle's scoop; then apply a fine probe, pointed with nitrate of silver, over the interior, smear the surface with a little oil, restore the position of the lid, and loosen the forceps. The instrument differs from Desmarres' in the position of the screw, the size and curvature of the blades, and in the mode of its application.

AFFECTIONS OF THE CONJUNCTIVA, CORNEA, AND SCLEROTIC.

Ophthalmia Neonatorum.—In this disease it is said that a new membrane is generated upon the surface of the conjunctiva, in the same manner that adventitious membranes are thrown out on the lining of the larynx, and upon that of the pharynx and isthmus faucium in diphtherite; and this, it is said, is what causes the rapid destruction of the cornea in these cases. The existence of this membrane is yet problematical. The conjunctiva is not prone to effuse lymph upon its external surface, but probably, under certain circumstances, it may do so. A case has lately been recorded by M. Bouyson, in which, during an attack of very severe purulent ophthalmia, a series of pseudo-membranes were formed upon the chymosed conjunctiva, which protruded between the lids; but in this instance the conjunctiva had been previously incised to relieve the distention, and we are not quite sure that the effused membrane was not poured out

(*a*) *Gazette des Hopitaux* for Dec. 2, 1847.

from the cut surface of the mucous membrane. The lining of the mouth occasionally pours out lymph in large quantities, so does the external surface of the membrana tympani and the distal extremity of the external auditory passage, and it is possible that the mucous membrane of the eye may do so likewise; but the matter requires further investigation. M. Chassaignac, the discoverer of this pseudo-membrane (so called) in purulent ophthalmia, recommends the continual irrigation of the eye, by what he terms *Ocular Douches*, in order to wash away the membrane as often as it is produced. To effect this the child is laid upon a table, while a small stream of water(*a*) is made to play on the eyes, for several minutes together, frequently during the day. This mode of treatment is not so novel as the French surgeon believes. In the Dublin Lying-in Hospital, many years ago, the nurses of certain wards became so famed for their good management of purulent ophthalmia, that whenever a severe case of this description occurred in the institution it was immediately transferred to their care. The management consisted in the continual removal of the discharge, and the frequent cleansing of the lids by means of a fine sponge and lukewarm water. The plan pursued was to lay the child across the knees, and to let the water pour out from the sponge over the eyes, the lids of which were held gently apart(*b*). M. Chassaignac likewise informs us that these douches have been found highly efficacious in the removal of corneal opacities which had resisted the ordinary methods of treatment. The projection of a stream of water of different temperatures against the eye, both as a means of cleansing it from impure discharges, and as a most grateful method of relieving pain and irritation, has been employed in the Ophthalmic Clinique in Vienna since the days of Beer. We have lately established douches of this description in St. Mark's Hospital, and as we think they will be found highly efficacious in similar establishments elsewhere, and should be employed in every hospital where diseases of the eye are treated, we give the accompanying illustration. Moreover, by this means the possibility of conveying infectious matter from one patient to another, by means of sponges, &c., will be in a great measure avoided. In this section, A represents a zinc or tin cistern capable of holding from three to four gallons of water, and which is fastened to the wall of the ward or waiting-room. It is open at the top to allow of its being filled, but closed by a well-adapted lid, in order to exclude all impurities. A funnel-shaped zinc tube, furnished with



(*a*) *Revue Medico-Chirurgicale*, September, 1847.

(*b*) See Dr. Evory Kennedy's paper upon the Purulent Ophthalmia of Infants, read at the meeting of the British Association in Dublin, in 1835.

a fine strainer, is attached to its bottom. This ends in a pipe B of quarter inch bore, which is also fastened against the wall, and bent into the curve here represented. This is furnished with a stop-cock at C, and its extremity is so constructed as to permit of several descriptions of tubes and roses being attached to it. This curve is about three feet and a half from the ground, so that a person of middle stature may be within reach of the jet of water when stooping his head over it. D is a zinc basin furnished with an ordinary plug and waste-pipe, into which the water falls, and which may be also used as the usual washing basin of a ward. The cistern can be filled with either hot or cold water as the occasion requires, and in large establishments it may be connected with the ordinary forcing apparatus. The strength of the stream or jet can be regulated by the stop-cock.

Scrofulous Ophthalmia.—The irritability of the Schneiderian membrane in this disease, and the sneezing and other phenomena which it so frequently presents, are well known to every practical surgeon, yet, until lately, the actual condition of the mucous membrane lining the nose has not received much attention. M. Morand has lately directed particular notice to this circumstance. He says: "In scrofulous ophthalmia the olfactory membrane participates with the conjunctiva in the inflammation that is set up; that it is especially about the turbinate bones, and in the anfractuosities of the nasal fossæ, that the inflammatory action resides; and that this shows itself in the form of an œdematous engorgement, precisely similar to what is observed in the eye-lids. The more I study this disease, the more convinced am I that this is the case. A little attention suffices to show that the redness and tumefactions of the pituitary membrane almost always precede or accompany that of the conjunctiva. This can be more positively determined by means of the speculum auris. On examining attentively the interior of the nasal fossæ, one cannot fail to observe that the redness and swelling of the nostrils, and even of the upper part of the lip, that are so commonly observed in persons of a scrofulous habit, are merely an evidence of the inflammatory action going on in that membrane. It is by proceeding in this way that we can best appreciate the degree and extent of this inflammatory action, the extension of which to the palpebral and ocular mucous surfaces is often very rapid; sometimes, however, it remains for a long time stationary, without showing any disposition to extend." For the relief of this disease M. Morand applies the nitrate of silver, either in substance, solution, or ointment, extensively over the surface of the pituitary membrane. The value of this remedy has been extensively attested by Dr. Edwards of Bath, and, according to his experience, with the most decided benefit, even in cases of long standing, and where other remedies had failed(*a*).

Granular Conjunctiva.—Except in Egypt, we have never seen so

(*a*) Lancet for April, 1847.

many instances of what are termed granular lids as in Ireland. The cause of this it is as difficult to explain as it is why syphilitic diseases, with a breach of surface, are so prone to spread and run into phagedenic sores, in one part of Europe, and to throw out condylomatous excrescenses in another, for instance, in Southern Germany. The fact as to the peculiar disposition which the conjunctiva, particularly of the upper lid, has to become granular, either during the progress of, or as the sequel to the ordinary ophthalmiæ, among the lower orders in this country, is well known to practitioners. In certain subacute forms of ophthalmia, particularly among the ill fed, badly housed, and poorly clad artisans and labouring population of this city, this granular condition can often be observable at a very early stage of the disease, when the villi upon the palpebræ become developed, like a kind of nap, upon the surface of the cartilage. The conjunctiva may be intensely red, but still shining and polished, and presenting distinct vessels. As soon, however, as the villi become developed in its first stage towards granulation, these vessels are no longer distinguishable, and the surface presents a dull red hue, and, when it is examined with the lens, presents a roughened velvety appearance. From this to the stage where the surface of the upper lid, in particular, resembles a ripe raspberry, with distinct nail-headed granulations of several sizes, the appearances have been already described in books. It is to such cases, which are often met with in discharged soldiers, that we would now draw attention. Having frequently remarked that in cases which had recovered from granular lids, the surface of the conjunctiva covering the cartilage presented a number of white furrows or cicatrices, crossing one another in different directions, it occurred to us that if those could be produced artificially, it would hasten and facilitate the removal of the disease. When, therefore, upon the lid being everted, a few of these granulations, with narrow pedicles, present above the rest, we remove them rapidly with a curved scissors, and also as many as stand out at the line of reflection of the everted cartilage, where they are usually very abundant. And then, or in cases where such peculiarities may not present, we make a number of incisions through the granular surfaces, down to the cartilage, with a small round-pointed knife, like an old-fashioned dinner-knife. These incisions should commence below, in order that the blood may not obscure the operator's vision, and run the whole length of the cartilage. Four, at least, of these should be made, and they should be crossed by a number of cuts, drawn from above downwards, nearly perpendicular. By this operation a description of "firing," like that which is performed upon horses, is put in practice. The lid should be kept everted as long as the patient can bear it, in order to promote the hæmorrhage, which is often considerable. The next day, upon examining the part, it will be found very much paler, and the granulations sunken and flabby, particularly along the line of the incisions. We then rub the surface of the lid, and particularly the incisions, with a smooth, heart-shaped crystal of

sulphate of copper, taking care to insert it likewise under that portion of the lid behind the angle of reflection, which cannot be well exposed to view, for there the granulations are generally most abundant, and often remain and keep up irritation long after those lower down upon the lid have been cured. The surface of the lid should then be well oiled, as this lessens the subsequent pain very much. By these means, firing the lids every fourth or fifth day, and applying the bluestone on the alternate days, we have succeeded in curing cases of the most inveterate granulations. At the same time, constitutional treatment should not, by any means, be neglected; and among the strengthening medicines which we possess, cod-liver oil seems here particularly efficacious. In some cases the application of a single leech to the internal surface of the upper or lower lid every second day will be found very effectual; and, thus applied, leeches do not usually produce that œdema and erysipelas to which some persons are so liable, but great care must be taken that the leeches are not allowed to adhere too near the edge of the lid, where the wound which they make is often very annoying.

The following *Method of Applying Sulphate of Copper* in the granular state of the upper eye-lid we have employed for some years; it will be found much more efficacious, less painful to the patient, and much more easily applied than the ordinary mode of proceeding. The piece of bluestone should be shaped somewhat like a spade in cards, with a blade about three quarters of an inch long, and filed down to the eighth of an inch in thickness. It should be fastened by its shank in a large quill, and occasionally rubbed smooth with a little water, to keep its edge and surface even. When about to be used, the lid need not be everted, but slightly lifted off the globe, by drawing the integument upward against the brow in the usual manner, and then the piece of bluestone may be inserted underneath the lid, towards the internal side, as high up as possible, and held a little out from the eye, so that it does not touch the surface of the globe. It is then drawn downwards and outwards towards the external angle. It is astonishing with what facility this manœuvre, after a little practice, can be accomplished, and what little uneasiness it causes the patient. Moreover, by this means we at once reach those large flabby granulations which are seated high up towards the reflection of the conjunctiva from the globe, and where, owing to there being less pressure exercised upon them, they grow much larger than anywhere else.

Dr. Clay Wallace, of New York, recommends a solution of six or eight grains of chloride of gold to an ounce of water, for the removal of granulations on the mucous membrane of the lids. "In recent cases," he says, "the chloride of gold is inferior to the nitrate of silver in curative effects, and it occasions far more irritation: in chronic thickened lids, on the other hand, it is vastly superior."(*a*)

Dr. Hays, in his commentaries on Mr. Lawrence's work, says

(*a*) The Boston Medical and Surgical Journal, November 3, 1847.

that "a very large proportion of the applicants for admission into Wills' Hospital labour under this disease; and the treatment which they have undergone, as well as the statement of several patients, lead us to infer that physicians, generally, are not as well acquainted with the complaint as it is desirable they should be. Two years ago we were led by the favourable reports of the efficacy of iodide of zinc, in reducing enlargement of the tonsils, to try this application in cases of greatly thickened conjunctiva of long standing, which had proved rebellious to various remedies. The result was so satisfactory that we have since employed it in a few similar cases, and our experience thus far authorizes us to recommend this remedy to the attention of the profession." In using this remedy, it is necessary to evert the lids, and wash off the caustic with some tepid water and a fine sponge, immediately after its application. When the eye is irritable, and there is much lachrymation, the author recommends a cold salt-water bath to the eyes. The douche, described at page 476, will prove a useful mode of applying this.

Mr. Wharton Jones's work contains several useful though brief remarks on the subject. He says: "The ocular conjunctiva does not become granular, as the palpebral conjunctiva does, seeing that it does not possess a papillary structure, similar to that which, in the palpebral conjunctiva, forms the peculiar seat of granular prominences. Any granular appearance which may be presented by the sclerotic, or corneal conjunctiva, is owing to real granulations." He very properly lays stress on the necessity of examining the state of the internal surface of the upper lid in all cases of chronic ophthalmia. It is astonishing with what rapidity granulations will form, in some cases, and in some constitutions, even in the acute stage. In the epidemic of post-febrile ophthalmia, which we had lately in this country, when the disease was seated in the external tunics of the eye, a granular condition of the entire palpebral conjunctiva often formed in a few days, the granulations being of a dusky red colour, large, and flabby. The patients in these cases generally had had one or more relapses of fever, and one of the most remarkable and constant symptoms in the disease, both when it presented as an external ophthalmia, chiefly affecting the conjunctiva and sclerotic, and also when it seized upon the internal structures, and was accompanied by defective vision, was a feeling of pressure upon the upper surface of the globe, as if the finger was buried deeply beneath the edge of the orbit. "In the treatment of granular conjunctiva," continues Mr. Jones, "care and perseverance are required, carefully conducted diet and regimen; tonics, good air, and protection from changes of weather, are important general points of treatment. The local treatment should consist of, first, the application of a leech or two to the eye-lids, occasionally, to relieve congestion; second, counter-irritation kept up by repeated blisters to the nape of the neck; third, scarifications of the affected conjunctiva, every second or third day, and immediately thereafter, the application of some strong salve, such as red precipitate. If the

granulations are large and prominent, instead of simply scarifying them, they may be shaven off with a lancet-shaped knife, or if pedunculated, they may be stripped off, one by one, with curved scissors."(*a*) In another place the same author says: "A mode of scarification which I have employed with advantage, consists in making a small crucial incision through each granulation, or, when they are small and closely compacted, by making a number of cross hatches."(*b*) The latter mode of practice strongly coincides with our own operation described above.

M. Desmarres uses caustic pencils of graduated strength, prepared by mixing nitrate of potash with nitrate of silver, in the proportions of one-half, a quarter, and the eighth of the caustic ingredient.

Gonorrhœal Ophthalmia.—In his lecture upon syphilitic diseases, lately published in the Lancet(*c*), M. Ricord recommends the application of the solid nitrate of silver to the affected surface, so as to produce a white film, but not to destroy the tissues; after which he advises the thorough irrigation of the part, in order to wash off any portion of the salt which may adhere. By this means, he says, the secretion is momentarily suspended, but when the crust formed by the caustic falls off, the pus reappears, though it is then lighter in colour and turns sero-sanguineous. "So long," he says, "as little white streaks, the result of the cauterization, remain visible, and so long as the secretion is not again purulent, you may judge that the influence of the nitrate is continuing; but when the streaks have disappeared, and the secretion re-assumes its primary character, you may infer that the effects of your cauterization are over, and you may then repeat it; indeed it can safely be used three times a day." He thinks that mercurial friction in the early stage of the disease rather tends to increase than diminish it. When chemosis ensues, he advises its immediate incision; at the same time he thinks that the cauterization should precede the incision. It is in the early stage of this symptom, and when it is merely the result of œdema, that he thinks most benefit can be derived from it, but "when the chemosis has reached the phlegmonous state, it can no longer be excised, you must then have recourse to scarifications, but their effects are very inferior to those of excision. In the interval between the cauterization with the solid nitrate of silver, I inject into the eye, three or four times a day, a weak solution of the same salt." M. Ricord also depletes largely, both generally and locally. While we agree in the general rules laid down for the treatment of this disease by the distinguished author whom we have just quoted, we confess our dread of rubbing the coats of the eye three or four times a day with the solid nitrate of silver. Upon the subject of the treatment of the urethral discharge, during the continuance of the

(*a*) Ophthalmic Medicine and Surgery, p. 177-8.
(*b*) Ibid. page 38, s. 149.
(*c*) The Lancet, February 12, 1848.

ocular affection, M. Ricord's observations are worthy of attention. The urethral discharge, he says, no doubt diminishes, but never altogether ceases, when the eye is engaged. He objects to taking pus from another individual in order to reproduce the urethral discharge, because, as he justly says, there may be latent chancres in the urethra which yields the pus, and then an additional misery might be entailed. When the ocular disease has been communicated from the urethral discharge of the same person, he uses copaibia "in order to control the urethritis, as in so doing I remove the chance of relapse as regards the eye."

Intermittent Quotidian Ophthalmia.—Dr. Lohman, during the intermittent fever which prevailed last year, observed the following case. A man thirty-eight years of age was attacked for five consecutive days, at the same hour, by violent pain in the left eye, accompanied with increased flow of tears, redness of the conjunctiva, and some intolerance of light. An hour afterwards the pain extended to the orbital region, and towards evening, about seven o'clock, the symptoms gradually diminished, perspiration ensuing. The next morning no sign of the disease remained. The right eye was not in the least affected. Before the occurrence of the attack each day the patient experienced some uneasiness, not, however, amounting to rigor. Leeches, blisters, and various applications, were tried in vain. The administration, however, of twelve grains of quinine cut short the disease on the sixth day(*a*).

Fatal Tetanus from Injury of the Cornea.—Mr. Pollock has related a case of a man, aged 33, who had received a lacerated wound of the cornea, from the lash of a gig whip. The cornea was completely divided, but there was no prolapsis of the iris. Violent inflammation ensued, and on the evening of the sixth day tetanic symptoms set in; on the ninth trismus was fully established, general tetanus ensuing; he died upon the tenth morning, the globe having previously suppurated(*b*). The case is one of extreme interest.

Rupture of the Cornea.—A case of this description has been lately mentioned as occurring from the extraction of a molar tooth, in performing which the maxillary bone was fractured. It is said that at the moment both sight and hearing were lost, so that we must suppose the shock was very great. The cornea of the eye immediately presented a peculiar livid appearance, and the hernia of the iris suddenly took place through the rent. Violent inflammation appears to have ensued, and a large staphyloma followed. Dr. Duval removed this latter, as well as the protruding chemosis upon the eighth day after the accident, by which means the pain and inflammation were greatly lessened. Both the senses of hearing and tasting were greatly impaired by the accident, and have not since been recovered. These defects are attributed to some lesion of the fifth pair of nerves.

(*a*) *Gazetta Medica di Milano*, February 27, 1847.
(*b*) Medical Gazette, June 4, 1847.

Opacities of the Cornea, Collyria, &c.—In our Report of last year we expressed our opinion pretty strongly on the subject of the various remedies proposed for the removal of specks and opacities on the cornea. The Journals teem annually with the praises of various therapeutical agents, the efficacies of which in such cases are said to be infallible. So long as those notices are confined to isolated cases, recorded by practitioners, who do not treat diseases of the eye on a large scale, and who simply relate that the patient had an opacity of the cornea, without stating exactly what the pathological condition of the parts were, we have no desire to do more than merely enumerate the various panaceas, from brandy and salt to prussic acid. But when we find a surgeon to an ophthalmic institution now extolling the virtues of the latter remedy for the removal of albugo leucoma and nebulæ, we are inclined to examine the cases which he has recorded with some care. The Turnbull delusion of curing cataracts, corneal opacities, staphylomas, and even amauroses, by the vapour of prussic acid, has passed away in this country. Not so, however, in British America. Dr. Howard, of Montreal, has carried thither the hydrocyanic treatment of corneal opacities. It is said that "of eighteen with albugo, twelve were cured and six relieved; of seven with leucoma, six were relieved and one abandoned as incurable." Before we make any further remarks upon these broad assertions, we must here again, as we did last year, distinctly protest against the loose descriptions of corneal opacities under the heads of specks, feathers, nebulæ, clouds, opacities, pearls, leucomas, albugos, cicatrices, and even staphylomas of the cornea, which are daily reported in the periodicals to have been cured. In order to enable us to judge whether the case was one susceptible of cure by time, improvement of the constitution, the ordinary efforts of nature, or the use of local stimulants, we must have it distinctly specified what was the cause of the opacity, through what portion of the substance of the cornea it had proceeded, and whether there was adhesion of the iris to the cornea or not. Until those things are fairly stated by the ophthalmic surgeon, the profession must receive with caution the cures reputed to have been performed by any particular agent, even though the patient may have—as occurred with one of Dr. Howard's—"before returning to Wales, his native country, left a certificate (as a voluntary effusion of gratitude), stating the benefit he had received."(*a*)

M. Laundrau recommends the application of a collyrium composed of twelve drops of tincture of iodine in seventy grains of distilled water, in cases of suppurating and ulcerated cornea, with pus both in the anterior chamber and the laminæ of the cornea; and records one case in particular, in which the purulent matter filled one quarter of the anterior chamber, in which this treatment proved efficacious in causing absorption, after other treatment of an antiphlogistic

(*a*) The British Medical Journal of Physical and Medical Sciences, edited by Dr. Archibald Hall, Montreal.

nature had failed(*a*). The efficacy of the external application of the strong tincture of iodine, in dispersing swellings and causing the absorption of indolent tumours, particularly of a glandular and scrofulous character, is already well known, but we very much doubt its efficacy in the instances cited by M. Laundrau. Depots of matter in the anterior chamber of the eye are of frequent occurrence in this country; and during the past year the number of accidents arising from stone-breaking, to persons not generally in the habit of performing such labour, was greater than usual. When matter forms in the cornea it is either diffused or circumscribed; the latter is generally the result of the ordinary pustule, and when it is discharged an ulcer remains, which may open, as is usually the case, externally, and its contents, with the subsequent secretion, be washed off with the tears and the motion of the eye-lids; but sometimes it opens internally, and then the matter, falling into the anterior chamber, deposits in a crescentic shape between the cornea and the iris; level, as is the property of all fluids, above, and semicircular below, precisely resembling the white appearance seen at the root or posterior margin of the human finger nail,—and hence the ancients gave this appearance in the eye the name of *onyx* or *unguis*. Yet, strange as it may appear, with the exception of the late Mr. Tyrrell, no writer of modern times has properly understood or defined this term; even Mr. Lawrence, although he is quite conscious of the difficulty, and even expresses in words the exact appearance which we have been describing, still retains the old term, as may be seen from the following quotation: "It has been commonly represented that when the cornea suppurates, the effused matter insinuates itself between the laminæ, finds its way to the bottom, and, accumulating at the lower edge, produces there an appearance which has been called *onyx* or *unguis*, from its resemblance to the mark at the root of the nails. I believe that the cornea is too dense to admit of this mechanical sinking of the matter, and cannot say that I ever saw onyx in this sense. I believe that the matter remains in any part of the cornea in which it may have been deposited. The appearance similar to the white mark at the root of the nail takes place where matter is effused into the anterior chamber, that is, in hypopyon rather than in suppuration of the cornea or onyx."(*b*)

It is time that this very general error in ophthalmic writers should be corrected. Suppuration of the lens, or of the iris, or a general suppuration within the globe, or pus poured out from the membrane of aqueous humour, and where, as well as in ulcer upon the back of the cornea, a stream of purulent matter may often be perceived coursing down the back of that membrane, will all give rise to this appearance. In hypopyon, however, the matter is more or less diffused throughout the laminæ of the cornea, and not inaptly resembling purulent infiltration of a limb in certain forms of erysipelatous

(*a*) *L'Union Medicale* for 7th October, 1847.
(*b*) Lawrence on the Eye;—American edition, p. 337.

inflammation. This is very frequently the result of such mechanical injury as a piece of stone or brick striking the cornea smartly; slow but generally-diffused inflammation of all the tissues of the eye usually follows. The organ is more prone to degenerate into suppuration than pour out lymph or run into the adhesive process, as occurs in the more active forms of ophthalmia, or when the wound has been inflicted by some sharp, cutting instrument. The usual practice here is to deplete largely, apply stimulating collyria, and put the patient upon the use of mercury; and even in some instances, where the pus had accumulated to a great extent in the anterior chamber, the cornea has been opened with the hope of relieving pain and letting out the contained matter; all of which practices, the lowering of the system, the employment of mercury, the use of lotions or drops, such as solutions of nitrate of silver, &c., and the meddling with the cornea, are, according to our experience, highly injurious; and we have seen many cases during the past year in which the organ was totally lost while the patient was under the influence of mercury; while, on the other hand, we have successfully treated several cases by the method about to be described, in which the anterior chamber was more than two-thirds filled with pus. The cornea was in a sloughy state, and infiltrated with pus; there was considerable serous chemosis; generally diffused redness of all the tissues; violent pain, particularly in the brow, and greatest at night; mucopurulent discharge from the eye; redness and œdema of the lids, together with a weak state of the constitution; small pulse; cold, clammy skin; paleness and anxiety of the face, and all the powers generally below par. In such a case as this, no matter how produced, we believe that mercury will increase the mischief. Small cuppings of the temple, or the application of a few leeches every second or third day, blistering the brow, and dressing the surface with mercurial ointment and belladonna, regulation of the digestive functions, but, above all, the liberal use of bark, a nutritious diet, and pure air; and as the inflammation lessens, the preparations of potash and iodine will be found effectual. The same observations apply to purulent deposits in the eyes of children labouring under the ordinary scrofulous ulceration of the cornea. In these cases the syrup of iodide of iron is an exceedingly efficacious and easily taken medicine.

Abscess in the Iris.—We have lately had in St. Mark's Hospital two cases of injury of the cornea from splinters of stones, which presented, on admission, all the symptoms above described. Upon the pus clearing off so as to permit the lower segment of the iris to be examined, it was found to present the rare appearance of abscess in the substance of its tissue. An open ulcer from which pus was discharging was plainly visible upon

the iris; and one of these cases, that of a man aged 35, presents, now that all the inflammatory action has subsided, the peculiar puckered yellowish white cicatrix of the iris which is represented in the accompanying illustration. The injury inflicted upon the cornea in this case occurred toward the upper portion, where a small leucoma, with attachment of a portion of the pupillary margin of the iris, still remains. The general haziness of the cornea is clearing off daily; there is some vision remaining, and the form of the eye is perfectly natural. The iris could not possibly have received an injury at the place where this cicatrix is situated.

Acupuncture for the Removal of Corneal Opacities.—The foreign Journals have been occupied during the past year with the details of cures said to be effected by this agent, which has been particularly recommended by M. De la Flor, whose claims, however, to originality in its introduction have been disputed. The mode of treatment consists in introducing an ordinary acupuncture needle, previously dipped in a solution of prussic acid, into the cornea, within half a line of the sclerotic, at the superior and transverse diameters of the eye, consequently at four points; and allowing the needles to remain in for from two to five minutes. The needles are introduced sometimes nearly as far as the laminated cornea, sometimes as far as the aqueous humour, and in other cases to the lens, by which we suppose the reporter means completely into the anterior chamber. Upon withdrawing the needles reaction and inflammation is to be met by the ordinary means in such cases(*a*). We have not tested this novel mode of treatment, nor are we sanguine in our expectations of it. It is possible, however, that the new action thus set up may excite absorption, and thus assist the removal of opacity. We have seen cases of corneal opacity of long standing, which were very much diminished after a smart attack of inflammation.

Cure of Corneal Opacity by Abrasion.—M. Szokalski says he has succeeded in removing opacity of the cornea by scraping its central portion with a knife, as a piece of paper is scraped to remove an ink stain. He repeats the operation several times, removing very little each time, so as not to induce inflammatory action, and he never scrapes the membrane near its circumference, for he is of opinion, that the central portion bears mechanical lesion much better than the circumferential(*b*). Herr Gultz of Vienna, some years ago, recommended, and also practised the operation of shaving off the external laminæ of an opacity, so as to get down on the elastic cornea, which is seldom injured or opaque..

Anæsthesia in Ophthalmic Practice.—We have on more than one occasion, both with reference to *ether* and *chloroform*, stated our opinion upon the value of this practice in ophthalmic surgery, and we have given both agents a sufficient trial. In painful or prolonged operations, the removal of an eye-ball, the extirpation of tumours, plastic operations on the lids, ectropion and entropion, we have used them with the usual efficacy in such cases. We have not, however, employed chloroform (and ether is more objectionable) in operations on the globe, because it is unnecessary, might in some cases prove injurious, and in several it is inapplicable. In most operations on the globe a certain amount of volition is necessary on the part of the patient; for instance, in strabismus, after the muscle has been fairly divided, and to all appearance cleanly dissected off the sclerotic, it is possible that some small fibre, particularly at the upper edge of its insertion, may still remain (as indeed we often know it does) and prevent the ultimate perfect success of the operation. Now to assure himself upon this subject, the operator should, as soon as he thinks the muscle has been fairly divided, and all the immediate cause of squinting removed, direct the patient to turn the eye inwards, in order to judge of the result of the operation. If the ability of squinting remains, something further must be done, either by searching for some undivided fibre of the muscle, or applying a ligature, &c., as we directed some years ago. But how are we to judge of this if the patient is unconscious? We do not think the operations for extraction, artificial pupil, reclination, or breaking up of a lens, are at all so painful as to require the employment of an agent to render the subject of them insensible. In extraction we should certainly fear to use it; we generally make the upper section, and the cornea is usually turned upwards during the use of chloroform; moreover, in this case it is also necessary that the patient should retain such consciousness as will enable him to turn the eye in the different directions required. Suppose, however, we complete the operation with success during the state of insensibility, and that a slight convulsion, a spasm or a nervous excitability, seizes the patient upon awaking from the state of unconsciousness, prolapsus of the iris, loss of the vitreous humour, and perhaps complete collapse of the eye, may take place in an instant during this struggle, or the patient may, inadvertently, to use popular phrascology, rub his eye out. There may be, however, cases in which a state of insensibilily may be beneficial during the performance of such delicate operations.

Dr. Mackenzie recommends the employment of ether (and, we presume, of chloroform on the same principle), in the treatment of various forms of ophthalmia, particularly where there is much photophobia. In the cases where these means was employed, the immediate relief to the distressing intolerance of light was very manifest; but it does not appear to have produced any material alteration in the progress of the disease(*a*). Dr. Smith of Cheltenham has also written on the same subject(*b*); and says that he has employed this means largely to enable him to examine and manipulate on the eyes

(*a*) *Gazette Medicale* for 29th May, 1847.
(*b*) *L'Union Medicale*, March, 1841.

(*a*) Medical Gazette, June, 1847. (*b*) Idem, October 15, 1847.

of young children affected with strumous ulcerations, &c. Dr. Smith very justly remarks, that the state of insensibility is much more easily produced in young children than in adults. We have not, however, experienced such difficulty in the examination of ophthalmic cases, or the application of remedies, as to require the use of the means recommended by this writer.

Foreign Bodies in the Eye.—M. Petrequin, whose investigations we alluded to in our last Report, has lately enlightened the profession by an article on the best mode of removing foreign bodies from the eye, for which purpose he recommends camel-hair pencils, magnets, lancets, and probe-pointed bistouries, &c., as well as injections of rose-water, all which come under the same category as the various collyria recommended from month to month. When a foreign body, such as a bit of coal or metal, sticks in the cornea lining the upper lid, it is easily removed by everting the lid. When adhering to the cornea the only instrument which we ever find necessary for its removal is a sickle-shaped cataract needle, in shape somewhat resembling that which we described at page 98 of the last Number of this Journal. It is unnecessary to advert to the mode of using it, or to enter at any length on the subject here. Every ophthalmic surgeon, particularly in large towns and manufacturing districts, has ample experience in treating these accidents. Notwithstanding the armamentarium recommended by the Montpelier surgeon, those small portions of iron which fly from the over-tempered steel picks used by millers in dressing millstones, or which are projected against the eye in turning metal, &c., are constantly removed by the workmen themselves, with a small piece of quill cut like a pen, which is kept in the establishment for the purpose. Mr. Bowman, who has lately investigated the structure of the eye with great attention, and who has discovered an *anterior elastic lamina*, like the membrane of Decimet, which lies immediately under the conjunctiva(a), states that "the existence of this lamina will help, I think, to explain what must have often puzzled surgeons, viz., the tenacity with which small particles of steel, or other sharp angular fragments, stick in front of the cornea, or just within the surface. These will often remain for many days, or even weeks, and prove the cause of much inflammation, and yet be still found difficult of extraction, which could hardly be the case if the laminated tissue and the conjunctiva epithelium were the only textures in which such particles could be imbedded."

Corneitis.—We were somewhat surprised when we read an article a couple of years ago in the Edinburgh Medical and Surgical Journal, in which the inflammatory diseases of the cornea were described by the author as if they were unknown to the profession; and our attention is again directed to the subject by a lengthened

(a) See Todd and Bowman's Physiology, and Mr. Bowman's Lectures, published in the London Medical Gazette for October and November, 1847.

review of Desmarres' book, which has recently appeared in Dr. Ranking's Abstract, in which the writer states that the French oculist's description of punctiform corneitis is so novel that it has been given in a condensed form in the extracts published in that work. Desmarres enumerates a superficial and deep-seated form of this disease, but it is unnecessary to enter at any length into his descriptions. The disease consists in inflammation and consequent thickening and opacity of the membrane of aqueous humour lining the back of the cornea, and extending to the membrane of Descemet, in which the inner surface of the cornea presents a speckled or dotted opacity, as if sprinkled over with a fine bluish-white powder, and which is most easily recognised by examining the cornea in profile, by which means we assure ourselves that the laminated, external elastic, and conjunctival layers of the cornea are not affected. This disease more frequently spreads to the substance of the cornea than to the iris. It is a form of inflammation well known to those who treat diseases of the eye upon a large scale, and has been frequently described by English authors. Mr. Tyrrell has described it under the name of aquo-capsulitis; and to his description, as it happens to be that which is now nearest to our hand, we would refer the reader of the work to which we have just alluded.

Ulcers of the Cornea.—In penetrating ulcers of the centre of the cornea, with prolapsus of the iris, we are told by M. Desmarres that we should not despair of the reduction of the iris unless gangrene of that part has set in. Now what gangrene of a portion of protruded iris may be we confess we are ignorant. While the term hernia is not inaptly applied to this peculiar state of the parts, the surgeon must not suppose that all the changes which take place in a portion of strangulated intestine occur in the iris. When a portion of the iris has protruded through the cornea, either from a wound or ulceration, and become there adherent, the protruding portion of it is not got rid of by gangrene, and it frequently requires to be removed by excision after days and weeks of irritation. For prolapsed iris Desmarres recommends the patient to be kept in a recumbent position, with the head low, and iced infusion of belladonna and hyoscyamus to be applied with light compresses to the eye, and a drop of the same liquid distilled between the eye-lids every five minutes. We strongly object to this opening of the eye-lids every five minutes, as we can conceive nothing more likely to increase the protrusion than this very proceeding. We must here again refer to our observations upon the use of atropine, published in the fourth Number of this Journal for 1846, p. 555. We still believe that the best thing which can be done in penetrating ulcers of the centre of the cornea is to touch the rupture with a weak solution of nitrate of silver applied with a fine camel-hair pencil (but if the iris has protruded it is better to omit this); then to drop into the eye a strong aqueous solution of atropine; to close the lids carefully with a strip of isinglass plaster extending from the forehead to the cheek; to apply the extract of belladonna plentifully in the usual manner all round the external parts; to les-

sen congestion and inflammation by local depletion, such as cupping or leeching, &c., and to relieve whatever other urgent symptom may present; to confine the patient to bed or the recumbent posture; to enjoin extreme rest, and not to meddle with the eye for forty-eight hours at least. There is a gentleman of our acquaintance who suffered from violent ophthalmia many years ago. His left cornea is quite irregular upon its external surface, and is apparently thinned from previous ulceration. He has had several attacks of sclerotic inflammation, with slight superficial ulceration of the cornea, in both eyes. Upon each occasion the left cornea gave way during a fit of sneezing, coughing, or some similar sudden exertion. The aperture was not like that formed by a penetrating ulcer, but was a rent or tear upwards of a line in length, extending across the transverse diameter of the cornea. On two of the occasions the iris protruded, and once a portion of it had prolapsed for several hours before I saw it; yet, by the treatment above described, he recovered perfectly, with a slight brown mark left by the pigment of the iris upon the back of the cornea.

The transparent ulcer of the cornea has been long known and described; in some instances, however, we are unable to detect it when we examine the cornea in front, and only become aware of its existence by observing it in profile, or making the patient roll the eye about. There is, however, a symptom attending this form of ulcer with which we have been long acquainted, and which has not, that we are aware of, been heretofore described; it is the dark shadow thrown upon the surface of the iris by this ulcer, be it ever so transparent or so small, particularly when the patient stands opposite the light. At first view this shadow, which is generally a dark circular spot through which the natural colour and striæ of the iris can be seen, appears like an ordinary congenital mark, but from this it can be distinguished by turning the head or eye from side to side, when it will be seen to shift its place on the surface of the membrane.

Conical Cornea.—Mr. W. W. Cooper has lately paid particular attention to this peculiar disease, and communicated to us the result of his experience. The pathology of this affection, as explained by Mr. Middlemore, and Jäger, of Erlangen(*a*), is, that the alteration in the form of the cornea is caused by the interstitial absorption of its central portion while the circumference remains healthy, the pressure of the aqueous fluid causing this portion to yield, and that it is thus pressed forward. "The membrane being thus weakened," writes Mr. Cooper, "is not in a condition to recover itself, unless the pressure from behind is removed, or support afforded to enable it to counteract that pressure. I have, therefore, endeavoured to combine these measures by evacuating the aqueous humour, and making moderate pressure on the front of the

(*a*) See Dublin Journal of Medical Science, vol. xxviii. pp. 102, 103.

globe, by means of an air cushion, acted upon by a spring, after the manner of a truss. By employing fluid pressure, I hope to afford general support rather than pressure upon the apex of the cone, only such as would result from the pressure of a solid body, which would also be more likely to excite irritation and other evil consequences." This plan was adopted in five cases without producing pain or irritation, but in neither case could it be persisted in for longer than three weeks, "in consequence of the air cushion, which was made of fine membrane, permitting the air to escape after being worn for five or six days." "Decided benefit, however," continues our informant, "did arise in a case where the apparatus was worn for a month, the aqueous humour having been evacuated three times during that period; and should the difficulty of obtaining a perfect apparatus be overcome, my belief is that this plan of treatment, in combination with general measures, will be found advantageous." Although this method is ingenious, we confess that we are not very sanguine as to its results, nor do we think any description of pressure will produce a thickening in the cornea, while at the same time it preserves its transparency. The only case in which we have ever produced permanent benefit was one in which we performed an artificial pupil, as recommended by the late Mr. Tyrrell. In this instance the lady was scarcely able to find her way through the streets. She had consulted the principal oculists in these countries, and had undergone several courses of treatment. She had been for a long time under the care of the late Mr. Wardrop, who tapped the cornea several times. In the summer of 1842, assisted by Mr. Cusack, we performed an artificial pupil in her right eye, not, as recommended by Mr. Tyrrell, by cutting out a portion of the iris, but by drawing its pupillary margin through an incision in the cornea, made close to its insertion, with the sclerotic externally. By this means the pupil presented the appearance here figured. This lady now reads very well by holding the book towards the right side.

Under this head may also be classed the following interesting case. A lady, aged 35, lately consulted us for what she termed weak sight, a difficulty in reading or discerning objects clearly in a strong light; but when the light does not fall upon the eye she can read pretty well. Upon looking at the eyes in front, a small, greyish, shining spot presents in each cornea, a little within and beneath the centre. At first sight this has the appearance of a vesicle, and bears some resemblance to the ordinary air bubble which appears in badly made glass. Upon examining the eye in profile, the cornea generally does not present any unusual convexity; but we can perceive a small mammulary projection at the spot referred to, which in this view appears perfectly transparent. Upon applying a fine camel-hair pencil to this spot, or drawing it over the surface of the cornea,

it at once sinks into a depression at the projection. It is manifest that the cornea has become thinned at this particular spot. Each projection is not larger than a small pin's head, and it is remarkable that they are precisely similar both in shape, appearance, and situation, in both eyes.

In certain forms of long-continued ophthalmic disease, in hydrophthalmia, and other cases where there is considerable distention of the globe, vesicles frequently form upon the surface of the cornea. They are quite transparent, are sometimes as large as a third of a pea, and are evidently formed by a fluid collecting between the thickened conjunctival layer of the cornea and its anterior elastic lamina. They are generally indicative of the amount of distention. There is at present a gentleman under our care whose lens was broken up for cataract some years ago; violent inflammation immediately followed, succeeded by that of a slow, chronic, but disorganizing character; complete loss of vision, and an enlargement of the globe, ensued. When we first saw him about a year ago, he had been suffering for some months previously from violent pain and distention of the globe, arising, he said, from "blisters collecting on the eye." Upon examining the eye, we found it exceedingly tense and painful to the touch, with the conjunctiva of the cornea thickened, and raised into vesicles, which, according to the patient's account, always formed when the eye became painful. We tapped the eye at once, by introducing a broad, flat needle through the cornea, giving it a half-turn so as to enlarge the opening, and permit the fluid to escape. This gave immediate relief. Whenever this gentleman feels the eye painful, or the blisters forming, he comes to town, and has the fluid evacuated, when all pain and irritability ceases. The eye now is nearly of the natural size, and intervals of ease are lengthening.

Mr. Wardrop long since recommended the evacuation of the aqueous fluid in cases of corneitis and aquo-capsulitis; and M. Desmarres lately advised paracentesis of the eye as a means of assisting antiphlogistic treatment in the reduction of internal ophthalmia, whether idiopathic or the result of surgical operation(a).

AFFECTIONS OF THE INTERNAL TUNICS, DIOPTRIC MEDIA, AND SENSITIVE APPARATUS.

On the Structure of the Vitreous Humour.—Dr. Hannover, of Copenhagen, has lately investigated this structure with great care, and his researches have controverted the generally received opinion of its being entirely a cell structure. The opinion of Pappenheim (who, having hardened the vitreous humour of an ox and a man, by treating it with carbonate of potash), that this body was composed of concentric layers, like those of an onion, is not quite correct, at least as far as the human eye is concerned, for this appearance is evidently the result of the coagulation of the albumen. M. Brücke, from whose observations Müller took the description of the vitreous humour which he has published in his Physiology, used a concentrated solution of the acetate of lead; but this physiologist's description is true only in part, as it does not define in what manner the different layers terminate. Dr. Hannover, who made his observations on the vitreous humours of several mammiferous animals which had remained in a solution of chromic acid for at least six months, gives the following description of this substance. Its structure is clearest in the horse; if a transverse section of the eye be made horizontally, and passing through the optic nerve, a great number of concentric lamellæ, which divide themselves into smaller ones, are observed; the external ones follow the internal circumference of the eye; they are thicker next to the retina, and thinner behind the crystalline lens. The vitreous humour, he says, considered as a whole, consists of several bags or cells, of various degrees of thickness, completely shut, and contained one within another. The exterior ones are naturally the largest, and the internal ones are nearer the entrance of the optic nerve than the lens. A line passing from the centre of the optic nerve, where it pierces the sclerotic, to the middle of the posterior surface of the lens, will pass through the summit of all these cells, and through the middle of their convexity. The exterior cells are softer and more transparent; the interior ones, especially those immediately behind the crystalline, are compact and thin; all the cells are thicker towards the sides of the eye, and become thin toward the optic nerve. If the eye is divided vertically, the same onion-like structure of the laminæ, particularly in the cat, dog, ox, and sheep, is observed. In man the vitreous humour is found to be chiefly composed of slices, the arches turned outward, and the angles converging towards the axis of the eye, somewhat like the segments of an orange, and this peculiarity is better observed in infants than adults. In two eyes which were very carefully examined by this observer, 180 rays were counted, but he has not been able to determine whether each segment has its own particular membrane, or a single membrane is common to two. Viewed with a microscope, the walls of the slices appear as simple transparent membranes, without any peculiar structure, but covered with innumerable small nuclei, which the author believes to be the result of precipitation. The axis, towards which all the slices converge, is the axis of the optic nerve. Having hardened a human eye in chromic acid, he made both horizontal and perpendicular sections of it. A horizontal section through the centre of the vitreous body presented an uniform plain surface, such as would result from the section of an orange cut right through the centre from pole to pole; whereas a perpendicular section of the vitreous body corresponded with what would result from a section of an orange made at right angles with that last described, viz., a number of rays converging

(a) *Journal des Connaissances Medico-Chirurgicales*, 1st July, 1847.

towards the centre, which rays correspond with the different divisions of the orange-like slices of which it is composed(*a*).

Cataract Statistics.—M. Sichel has lately published, in one of the Parisian journals, the result of his experience in cataract operations, in the shape of a statistical account of 100 eyes in sixty-four people, which were operated upon by him. In thirty-seven cases both eyes were operated upon; in this country we are generally inclined to rest satisfied with a successful operation on one eye. Of the entire operated upon, seventy-nine are said to be successful; of these, forty-one were by extraction, and thirty-eight by depression or breaking up, but the report does not say how many by each method: this is the more to be regretted, as we know that depression is a favourite method with the Parisian oculists, and it is one but little practised in these kingdoms. Ten were partially successful,—five by depression or absorption, and five by extraction; complete failure only took place in eleven instances, of which three were by extraction, and eight by depression or breaking up: the report states, however, that, of the failures, five of the cases had been pronounced amaurotic previous to operation. Of the sixty-four people, sixty recovered vision, and four remain blind(*b*).

Cure by Suction.—Notwithstanding the established opinions with regard to the most approved methods for removing or displacing the lens, and the recorded experience of the most scientific and practical ophthalmic surgeons upon the subject, we yearly read of new methods of operating, as well as other means, in the shape of medicinal agents, extolled for the removal of cataracts. When we find practitioners subjecting patients with established cataracts to a course of treatment both local and general, we are greatly inclined—to use no harsher term—to question their experience, and when we find men proposing new methods of operating, such as cutting out a cataract through the sclerotic, and advising depression or breaking up indiscriminately, in preference to extraction through the cornea, we are very much inclined to doubt their capability of performing that dexterous operation. M. Blanchet has lately promulgated a new method of operating upon soft cataracts, which he denominates the operation of suction (*par suspiration*). The pupil having been dilated with belladonna, he punctures the cornea with a large cataract needle towards its circumference, in order that the opacity which follows may not occur in the field of vision. Through this opening he introduces a small tube with a flageolet-like mouth, attached to an Anell's syringe, with which he pierces the capsule of the lens, and if the cataract is soft, he pumps it out through this tube by working the piston of the syringe; but if, on the contrary, the lens is hard, or the capsule dense and opaque,

(*a*) *Annales d'Oculistique*, Feb. 1848.
(*b*) *Gazette des Hopitaux*, for 7th October, 1847.

he then has recourse to depression!(*a*) Such is the statement which has been vaunted in all the foreign journals as a discovery in ophthalmic surgery, but which must raise a smile on the face of every well educated or experienced practitioner. In the first place, any thickening or opacity of the capsule should be discovered before an operation is commenced; and although the actual amount of softening—whether the lens is absolutely fluid, or is of its natural consistence as in a young healthy person, or as soft as ordinary starch made for washing—cannot always be determined upon before the introduction of a needle, still it can in most cases be decided with tolerable accuracy beforehand. If the lens be fluid, to attempt this suction is a most unjustifiable, as well as most unnecessary procedure; for the simple introduction of a needle through the cornea, and the laceration of the capsule, will allow the fluid to become diffused with the aqueous humour, in which case it will sometimes be absorbed in the space of a few hours. Every operator of experience well knows, that, even in those cases of fluid cataract, it is necessary to lacerate both the anterior and posterior capsules freely. If this is not done they will, though not previously opaque, become so very shortly; and while the substance of the lens is absorbed, both capsules will adhere, and become remarkably opaque, often remaining in such cases like a piece of egg-shell, held behind the pupil by a very thin, semitransparent membrane. And as these will not absorb, and can with great difficulty be depressed, it is frequently necessary to remove them through an incision of the cornea. Now the very wound made by M. Blanchet's suction pump is just the thing to produce this opacity; moreover, there must be a greater violence and injury done to the eye by this complicated process, than even by the roughest attempts at breaking up, whether through the cornea or sclerotic. In a case of congenital cataract in a young woman aged 18, upon whom we operated last year, and of which an account will be shortly published, this peculiar phenomenon occurred. Upon drawing the cutting edge of the needle across the anterior capsule, its fluid contents immediately burst out, and mixed with the aqueous humour, rendering the latter the colour of skimmed milk, and completely obscuring the iris. Having placed a bandage upon the right eye, we then proceeded to operate upon the left, when the same phenomenon occurred. In the space of about four or five minutes we removed the bandage from the eye first operated upon, when lo! the entire opacity had disappeared, except a few specks which remained on the torn capsule, and nothing was to be seen in the anterior chamber but a few grains of a white powdery substance at the junction of the iris and cornea beneath; and then, upon looking at the other eye, the same clearness was found to have taken place there also, and imperfect vision (for the patient had never seen before) was found to be established. Now we can only account for

(*d*) *Revue Medicale*, for August, 1847; and *Journal des Connaissances Medico-Chirurgicales*, p. 109.

this rapid removal of the milky state of the aqueous humour, by supposing that the heavier particles which formed it subsided, and, falling through the dilated pupil (for the patient was in the recumbent position), had deposited behind the iris, as a mixture of flour and water will do, if allowed to remain undisturbed; or that some chemical action had occurred between the salts of the aqueous humour and the opaque particles of the cataract.

Removal of Opaque Capsules.—In connexion with the subject of portions of opaque capsule remaining behind the pupil in the manner we have described above, and which are generally the result of insufficiently lacerated capsules in the operation for congenital cataract, we may mention the following mode of proceeding, which we have adopted with great success latterly. A single case out of many will suffice to express our meaning. A boy, now aged 16, had been operated upon for congenital cataract when quite a child; we saw him first three years ago; he could find his way tolerably well in a modified light, but could not read, and was unfit for any occupation requiring accurate vision. An irregularly-shaped piece of capsule, about a line and a half in length in its longest diameter, of a dense white colour, and striated with well-marked wavy lines upon its surface, presented behind the pupil, and was held in its position by a thin, fine membrane, which was attached to it all round, and fixed it apparently to the ciliary circle. Through this fine membrane, when the pupil was dilated, the boy was able to see as described above. Upon endeavouring to drill this membrane with a fine needle, it was found impossible to make any impression upon it, and it receded towards the fundus of the eye every time it was touched, and appeared to drag with it the ciliary margin of the iris. By a series of small operations, however, performed at different periods over a space of nearly fourteen months (for the patient was of a most inflammatory nature), we succeeded in making a number of apertures in this thin but tough membrane which retained the opacity in its place, until the latter was held by a stalk or pedicle next the outer side of the cornea. We then, assisted by Mr. Smiley, made an opening about a line and a half in length in the cornea, opposite this point of attachment. During the escape of the aqueous fluid, the opaque body rushed towards the opening; it was seized with a fine forceps, drawn through the incision, and its attachment divided with a scissors, the bit of thin semi-transparent membrane returned within the eye; and the usual treatment after operation resorted to. In a short time the same course was pursued with the other eye, and the boy now reads perfectly well with cataract glasses. In detaching or cutting through a piece of opaque capsule, such as that we have described, or an adventitious membrane closing the pupil, in which several operations are required, the needle cannot be made to work with effect when introduced at the same side of the cornea or sclerotic each time. These membranes, but particularly the cornea, act as the fulcrum of the lever into which the needle is converted during part of these operations, and it must be introduced at different points, and even sometimes at the nasal side of the cornea, in order to cut, lacerate, or detach such an opacity existing or adhering at the external side of the pupil.

Salivation previous to Cataract Operations.—M. Tavignot recommends the employment of mercurial salivation previous to cataract operations. He is led to this from the favourable influence which it exercises over acute inflammation, iritis and keratitis, the most frequent causes of failure in operations, according to this author. He advises the operation to be undertaken as soon as the first symptoms of salivation appear, and he continues the mercurial action for two or three days afterwards, so that the ptyalism may be at its height by the time secondary inflammation would be likely to ensue(*a*). We have only to remark, that we think the practice in the operation for solution unnecessary, and in extraction most injurious. Mercury will not always prevent local inflammation, and we have known cases of violent syphilitic iritis occur, when the patient was actually salivated for another form of the disease. Mr. Tyrrell, whose practical observations on the subject we would recommend to the attention of our readers, very justly remarks, that mercury sometimes prevents the union of the section of the cornea, by checking the adhesive process. In some cases mercury is imperatively called for, but not as advised by M. Tavignot(*a*).

It is, however, possible that mercury may be necessary as a safeguard in the very violent operations for cataract by depression, reclination, and solution, which we occasionally hear of being performed in Paris. Dr. Hays of Philadelphia, in commenting on this extravagant proposal, says very justly: "M. Tavignot must be a very unfortunate operator if iritis or corneitis usually occur after his operations for cataract, or even hæmorrhage into both chambers of the eye. We would respectfully submit whether it would not be advisable to adopt a different method of operating from that which he employs, rather than, for the insufficient reason he assigns, to subject patients to the evils of salivation. The fact that mercury is often efficacious in arresting inflammation affords slender reason for introducing it into the system to prevent the occurrence of that accident. The mercurialization of a patient will not protect him from the sequence of a badly performed operation."(*b*)

Cholesterine Cataract.—About six years ago, a butcher, aged forty years, consulted us for loss of vision in his right eye, the result of a blow received some years previously. Upon examination we found a hard cataract, of a remarkable yellow colour, and to all appearance of a calcareous nature. Certain portions of its external surface presented the brilliant metallic appearance known as gold-leaf cataract. From its singularity we had an accurate drawing made of it at the time, and then lost sight of the patient for some years. Twelve

(*a*) *L'Union Medicale*, August 5, 1847.
(*b*) The American Journal of Medical Science, for January, 1848.

months ago he again applied at the hospital, in great pain, and with the eye deeply inflamed, the result of a blow which he received upon the temple a few days previously in a drunken squabble, when, to use his own expression, his eye was burst. Upon examination we found that to a certain degree his opinion was correct, concussion and dislocation of the lens having taken place. The central nucleus of the lens was lying at the bottom of the anterior chamber, and a quantity of brilliant matter, like broken-up gold leaf, floated through the aqueous fluid, and adhered to the back of the cornea. When the eye had been at rest for some time, the greater portion of these particles subsided to the bottom of the chamber, but upon moving the eye, or on the patient's making any exertion, they floated upward, producing the appearance which we sometimes see in the fundus of the eye, and which, under the name of "sparkling eye," has recently engaged the attention of oculists. We had an accurate drawing made of the eye in this condition. The usual antiphlogistic treatment having failed to afford relief, and the pain being most intolerable, we agreed to extract the lens, and remove as much of the offending body as possible. As this very remarkable case afforded a rare opportunity for analyzing this peculiar form of cataract, Professor Aldridge carefully examined the case, and assisted us at the operation. We made an inferior section of the lower third of the cornea with Scott's extraction knife, which is well adapted for such cases, from the curvature on the back, and the little space which it occupies. During the incision a small eye-cup was held beneath the globe, in order to receive the lens, and other means adopted to preserve as much as possible of the substance we wished to analyze. As soon as the incision was completed, the great mass of the broken-up lens and the central nucleus immediately escaped, and the remaining fragments were removed with Daviel's scoop. Immediate relief was experienced; the wound healed by the first intention, but with rather a broad cicatrix. There was no adhesion or distorsion of the pupil. The globe did not collapse, but the vision had been for many years extinct.

We give the following account of the analysis from a letter of Professor Aldridge's: "You may recollect that previous to operation distinct and beautiful crystals were visible, attached to the interior of the cornea, similar to scales of yellow mica. These, during the operation, you scraped off at my request, and handed them to me, together with the extracted lens. The crystals referred to, when examined by the microscope, appeared under the form of rhombic plates. They were soluble in ether and hot alcohol, from the latter of which they recrystallized in cooling, and were insoluble in a solution of potash, which, however, removed their colour. The lens was anteriorly sprinkled closely with similar crystals, but when these were removed, by digesting with ether, the lens itself remained white and opaque. It was insoluble in water, alcohol, ether, or dilute acid, but readily dissolved when gently heated in a solution of potash, and was again precipitable by acetic acid. I think there can

be no doubt but that the crystals were chiefly composed of *cholesterine*, and that the cataract was due to the deposition of some proteine compound, and a distinct phenomenon from the crystallization of the cholesterine discovered upon its surface, and which was afterwards so manifest in the anterior chamber." Beside the general interest of this very curious case, there are two topics connected with it on which we would remark: First,—the value of having accurate drawings made of every remarkable case which occurs, even though at the moment no ultimate benefit, except that of representing a peculiar form of disease, may appear to be gained; and secondly,—the advantage which ophthalmic surgery must derive from the analysis of morbid products such as that described.

Persistence of the Membrana Pupillaris.—A case of cataract (so called), formed by the persistence of the pupilary membrane of Wachendorf, has been lately recorded in the Milan Gazette by Dr. Paolo Bernard. It occurred in one eye of a boy aged at the time of examination six months. The globes were perfectly normal, and the greyish opacity which presented within was mistaken for opacity of the capsule of the crystalline. The real state of the eye, however, was subsequently discovered; and, indeed, we only mention the case here on account of its having been mistaken for true cataract. There was a small opening in the centre of the membrane, and around this could be seen, says the relater, a number of vascular globules, similar to those mentioned by Cloquet in the pupillary membrane. No operation was required. Frictions of belladonna were used to the temple and eyelid three times a day, and calomel in small doses administered. Three days afterwards the membrane was found to be detached from the iris for two-thirds of its extent, and it was diminishing daily when the report was made(*a*). Instances of the persistence of the membrana pupillaris for even a later period than that specified in the foregoing case have been recorded by Ammon and other writers upon congenital defects of the eye.

Sparkling Eye.—In synchesis and certain forms of ophthalmic disease we sometimes observe, upon looking steadily into the depth of the eye, that there is a peculiar scintillating appearance exhibited. At times this has the appearance of small sparks of light, not unlike the phosphorescence which sometimes appears upon the surface of the sea, particularly when the water is agitated. Those brilliant sparks generally appear to rise up from the inferior surface of the eye, and fall down again in a description of shower. In two cases which we have had under our care, this appearance could be induced by any motion or exertion, when it very much resembled the look which a bottle of *eau de vie* presents when the gold leaf in it is shaken up. There are other appearances in the eye of a luminous character, with which this must not be confounded. In certain forms of amaurosis we can, particularly when the pupil is dilated, perceive a brilliant yellow appearance, with a metallic lustre, and of a spherical shape, lining

(*a*) *Gazetta Medicale di Milano* for 26th December, 1846.

the fundus of the eye. At first view this might be taken for the early stage of malignant disease, but the history of the case, the age of the patient, and the attendant circumstances, will enable us to distinguish it from that affection, although at times the differential diagnosis is exceedingly difficult. The scintillations to which we have alluded may or may not be attendant upon this form of disease. The cause of these appearances has lately engaged the attention of several continental writers. M. Desmarres thinks that it is due to a peculiar morbid disposition of the hyaloid cells, which, being less distended than natural, on account of the fluidity of the vitreous humour, and floating one over the other, reflect separately, instead of refracting the light. M. Malgaigne considers that this phenomenon is owing to the presence of little foreign bodies floating in the vitreous humour, and put in motion during the movements of the eye. These he believes to be crystals of cholesterine, which reflect the light as they present themselves to it in several inclinations. M. Tavignot's opinion coincides with the latter. He says that he has collected some of these sparkling particles, and that they bore the greatest possible analogy to the corpustules of cholestria sometimes found in the liquid of hydrocele. He does not know, he says, whether their chemical composition be the same, but he considers it probable; and he thinks that the crystalline capsule, from its serous character, at least upon one aspect, may give rise to a product similar to that produced by the tunic vaginalis(*a*). We incline to the opinion, that in a great many cases the sparkling appearances are caused by the chemical substance just alluded to; and we are the more induced to believe this from the examination of the gold-leaf cholesterine cataract already detailed at page 497; but there are other cases where the brilliant appearances do not present a palpable character like those just described, but appear as brilliant, evanescent scintillations of light, even in the anterior chamber.

New Iris Forceps.—We know of no operation (except lithotomy) for which so many and such complicated instruments are devised, as that of artificial pupil. The armamentarium chirurgicorum abounds with knives, scissors, hooks, single and double forceps, and all manner of ingenious contrivances of a like nature. We are not, therefore, surprised to hear of any new instrument invented for this purpose. Professor Beaumont, of Toronto, has lately invented a pair of forceps for detaching the iris from its ciliary margin in the operation by separation, or iridodialisis, instead of the ordinary hook employed in Europe. His reason for this innovation is, that in operating upon the dead subject, he "found the hook sometimes tear its way out of the iris, instead of detaching it;" and he fears that "the hook may possibly, in transfixing the iris, wound the capsule of the lens." Now, in the first place, we never knew either of these accidents to occur in a properly performed operation on the dead or the living subject. There are two hooks in use at present

(*a*) *Revue Medico-Chirurgicale.* August, 1847.

for detaching the iris: the one most commonly employed in England is the blunt hook, bent at rather an acute angle with the shaft of the blade, and well described by Mr. Tyrrell. That employed by Jäger, and generally throughout the Continent, and which we invariably use, is sharp, with a more circular curve of the bend; it enters the iris with much greater facility than the blunt hook, but it requires considerable care and dexterity in its management, particularly in withdrawing it through the corneal incision. Whichever hook is used, as soon as it has partially detached the iris from the ciliary body, the handle should get a half turn, so that the flat of the hook may present against the inner surface of the cornea, to which it should be invariably applied upon withdrawing it. An operation so conducted cannot possibly be injurious to the lens or its capsule.

The instrument of Mr. Beaumont consists in a forceps slightly bent in the blades, and having the points furnished with a pair of fine curved teeth, with which he transfixes the iris while the blades are partially opened; the blades are then closed, and the iris, thus entangled in their points, is drawn through the wound in the usual manner. We think it answers anything but the intention required, and is very much inferior to any of the forms of hook(*a*). We have had some experience in a variety of forceps, and have latterly found the accompanying form, which was given us by Professor Rosas, and here represented the natural size,

more useful for performing artificial pupil, withdrawing a bit of the iris, or removing a portion of capsule, than any other. It is as fine at the points as that invented by Mr. Dalrymple, and with a light hand can be used with much greater accuracy and delicacy.

Prolapsus of the Iris.—The ordinary myocephalon, or hernia of the iris, the result of a wound of the cornea, or penetrating ulcer, is frequently a most distressing symptom, and, in young children, where there is great irritability, lachrymation, and intolerance of light present, as well as exceeding timidity on the part of the patient, one very difficult to manage. If the protrusion is recent, it may frequently be reduced by the application of belladonna and atropine, and lessening excessive action locally; at the same time carefully avoiding all mechanical attempts at reduction. We usually cover up the eye for forty-eight hours after the accident, applying the belladonna as frequently as possible. With the rule laid down in books, of not applying the belladonna if the rupture has occurred near the edge of the cornea, we cannot agree, for if the iris dilates generally, it must of necessity tend to draw the small protruded portion within the chamber. If the iris has become adherent, all such attempts are fruitless; we must then direct our efforts to the removal of the hernia. Unless the patient is very steady, and will allow

(*a*) Medical Gazette, March 19, 1847; and Braithwaite's Retrospect, vol. xv. p. 322.

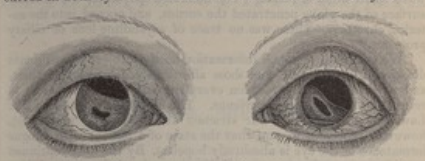
the operation to be performed quietly, and permit oil to be applied to the protrusion immediately afterwards, the use of the solid nitrate of silver is often injurious. Evacuating the fluid of the little sac with a fine needle can only be performed under like circumstances, as all rough handling, or forcible opening of the eyes, is injurious, and at times increases the mischief. When no progress has been made for more than the ordinary time, we have snipped off the protrusion with a curved, blunt-pointed scissors, and thus got rid of the cause of irritation. M. Desmarres has lately recommended *A New Method for reducing Iridial Hernia*, by cauterizing a spot upon the sclerotic conjunctiva, close to the corneal aperture, with solid nitrate of silver, the pupil having been previously placed under the influence of belladonna. By this means, he says, a very active inflammation of the vessels which feed the edges of the ulcer is induced, and by an increased secretion round the margin of the hernia it is set free, and drawn within the chamber. If one effort fails, he repeats the caustic several times. We have no experience of the practice, but intend to give it a fair trial(*a*).

Iritis.—One of the latest communications upon this subject is a series of lectures delivered at the London Ophthalmic Hospital by Mr. Dixon(*b*), and to these we would particularly refer our readers. There is, however, one opinion of Mr. Dixon's, with which we think few ophthalmic surgeons will agree, it is that, "invaluable,—indispensable as belladonna is in our examination of many morbid states of the eye, I confess I do not regard its local employment as of any service in iritis, for an inflamed iris loses its power of motion;" and at a later period, when the iris is beginning to recover its motory function, he thinks it may do harm by forcibly dilating the pupil, and thus leaving upon the surface of the anterior capsule of the lens those small brown pigment cells which adhere to it from the uvea. How many cases, however, do we see, where no belladonna was used, in which these brown specks subsequently present upon the lens; and how many cases of permanent adhesion have occurred from the disuse of this valuable remedy? It is true that the iris is not, during a high state of inflammation, as susceptible of the influence of belladonna as in its normal condition; but this want of susceptibility is exceedingly various; and in some cases the iris will dilate, though inflamed. In many instances we are able to break up slight adhesions by the influence of belladonna and atropine. Those very brown spots to which Mr. Dixon refers may, if belladonna is not used, become permanent adhesions between the iris and lens, with permanent contraction and opacity. How many cases do we see in which those fuscous specks or patches present upon the capsule of the lens, as the sequelæ of internal ophthalmia, when the vision is unimpaired? Upon the whole we are strongly inclined to the opinion that much greater mischief may be done by

(*a*) *Traite Pratique*, and Ranking's Abstract, vol. vi. p. 285.
(*b*) The Lancet for March 4 and 18, 1848.

the general omission than the indiscriminate use of belladonna in all cases of internal ophthalmia. In every other particular Mr. Dixon's lectures are characterized by sound sense and great practical experience.

Injuries of the Iris.—In the sixth Number of this Journal (for May, 1846), Mr. W. W. Cooper detailed and figured an interesting case, in which separation of the iris from its ciliary attachment occurred in both eyes of the same individual, the result of injuries at



different periods. The accompanying illustration explains better than words the nature of the accident and the appearance presented.

Mr. H. L. Smith has related a somewhat similar case of false pupil, which also occurred at the superior attachment of the iris. "This false pupil," he says, "varies much in size, being scarcely observable when the natural pupil is dilated, but enlarging when the natural pupil contracts. The false pupil is also, though not to a great extent, affected by the application of belladonna." This latter, however, must occur from its general effect upon the iris.

Malignant Diseases of the Eye-ball.—While we have nothing particularly new to record on this subject, we must refer our readers to a most admirable paper of Mr. Lawrence's, reported by Mr. Holmes Coote in the Medical Gazette for June 2, 1847. This paper is illustrated by wood-cuts, showing the microscopic appearances exhibited in the different forms of malignant diseases of the eye-ball, made from drawings by Mr. Coote. One of the forms of disease described in Mr. Lawrence's communication consisted in a change of structure in the choroid membrane, accompanied by absorption of the retina, hypertrophy of the sclerotic, and general enlargement of the eye-ball. The eye was extirpated, and the following is the examination of the parts; it does not, we think, exhibit a decided evidence of malignancy,—either melanosis, fungus hæmatodes, or true cancer:—"The globe was filled with a diseased growth, moderately firm, partly yellowish, partly reddish, of considerable vascularity, without any trace of the normal structures: it was very much like what is frequently observed in a scrofulous testicle. If it had been seen detached, no one would have supposed that it had formed part of an eye. Upon careful examination, it was found that this diseased mass was choroid and iris, both of them much thickened, entirely altered in structure, and in great part deprived of their normal coating of pigment cells. In the middle of the eye there was a small cavity,

with smooth and darkish surface, containing a little dark fluid. This cavity was occupied by a mass consisting of the reflected iris: it had pushed forwards against the posterior surface of the cornea, and had been from thence reflected towards the centre of the globe. The sclerotic was much thickened, in some parts to the extent of a quarter of an inch, its texture being softer than usual. The cornea was extended and thin. At the extremity of the optic nerve there was a small shred of retina. The ulcerated spot upon the anterior surface of the globe penetrated the cornea, and opened into the anterior chamber. There was no trace of crystalline lens or ciliary processes."

We still require much information on the subject of malignant diseases of the eye-ball, and those affections which resemble them, and we think it incumbent on every surgeon who treats such to record the result of his experience. The following opinion of Mr. Lawrence is worthy of our strictest attention:—"I would not, however, represent to you that the state of a patient with fungus hæmatodes of the eye is absolutely hopeless. By the long-continued use of mercury the progress of the disease has been arrested in a few instances, and the morbid deposition has been removed. I had under my care a case of this kind, in which I saw the morbid deposit in its early state, in which the globe afterwards enlarged, and the lens became opaque. The employment of mercury, persevered in for many weeks, completely arrested the malady; and the patient, after remaining well for years, died of affection of the head, excited by development of disease in the brain."

At one of the meetings of the Pathological Society of London, Mr. Dalrymple "showed a series of preparations, accompanied with drawings of the various forms of malignant disease of the eye, in order to prove the utility of operative interference in any stage of such affections. The result of extended experience has convinced him that where the globe had been extirpated at the earliest possible stage of the disease, the death of the patient was brought about sooner or later by the formation of secondary tumours in the brain, in the same manner as when the globe had been extirpated at a more remote period of the disease."(*a*) In our November Number Mr. Dalrymple published a valuable paper upon encephaloid disease, producing amaurosis, to which we would call the attention of our readers.

Mr. Hensley exhibited at the Bath Pathological Society a cast, and related a case of malignant disease of the eye-ball, the most remarkable circumstance attending which was, that after the destruction of one eye the other became affected(*b*). Upon examination after death the entire contents of the cranium, and even the bones of the head, were found diseased.

[If our space permits, we will continue this Report in a future Number during the present year.]

(*a*) Medical Gazette, March 26, 1848.
(*b*) Provincial Medical and Surgical Journal, Nov. 17, 1847.

OBSERVATIONS

ON THE

EPIDEMIC OPHTHALMIA,

WHICH HAS PREVAILED IN THE

WORKHOUSES, AND SCHOOLS,

OF THE

TIPPERARY AND ATHLONE UNIONS.

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[*Reprinted from the London Journal of Medicine, of January* 1851.]

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M.DCCC.LI.

ON THE EPIDEMIC OPHTHALMIA

WHICH HAS PREVAILED IN THE WORKHOUSES AND SCHOOLS OF THE TIPPERARY AND ATHLONE UNIONS.

Some notice of my reports to the Poor-Law Commissioners upon the Epidemic Ophthalmia which has prevailed for some time in a few of the Irish workhouses having already appeared in the newspapers, and a few detached fragments having been surreptitiously obtained and erroneously printed for the purpose of review, I am induced to write the following observations, and to give a corrected edition of my *Medical Report* to the profession. I have but few remarks to make with respect to the observations appended to the fragments which have been published elsewhere. They are these:—I was applied to, in the beginning of December 1849, to visit and report on the Ophthalmia which then raged in the Athlone Union. I did not do so, because I did not consider the sum offered a sufficient remuneration for my professional services. Upon inquiry, I have been informed that, in accordance with my desire, a copy of my letter to the Medical Officers of the Tipperary Union was forwarded by the Commissioners to the Medical Attendant of the Athlone Workhouse, which I visited a few days after I had been in Tipperary, and where the same form of disease prevailed; and that, in other instances, it was applied for by the medical attendants themselves.

With respect to any previous reports which may have been made to the Commissioners upon the Ophthalmia, I have nothing whatever to do. If the guardians of any particular union do not choose to adopt, or the Poor-Law officials to enforce the recommendations and suggestions contained in a report, no medical man should take offence thereat, any more than he would with a patient in private practice, who sought his advice, received his prescription, and paid the usual fee, but either from perverseness, indolence, or want of faith in the proposed remedies, or in the mode of recommending them, gave no further attention to the matter.

It was not my original desire or intention to write upon this Ophthalmia, but to leave to the Poor-Law authorities, to whom they belong, to publish my Reports or not, as they thought fit, in their own proceedings: but the use lately made of my letter to my medical brethren (not of the Athlone, but of the Tipperary Union, on which alone I was called on to report), has compelled me to adopt the present course. I cannot, however, but feel complimented by finding any one generous and philanthropic enough to print and publish at their expense any portion of my writings, no matter how obtained; and I only regret, that such publication was not through a medium where it might have had a more extensive circulation. How far that letter is in accordance with

the established rules of consultation communications, and professional etiquette, even where private patients are concerned: and how far the statements and recommendations contained in it are based on modern observation, and the scientific management of the disease under consideration by the most enlightened ophthalmic surgeons of the present day, the medical profession are the best and only judges. It is gratifying to me to be able to state, that the medical officers of the Tipperary Union not only willingly adopted all my suggestions, but have, in a written communication, expressed their satisfaction at the course which I pursued. The notes now appended to my Medical Report are the only additions made to it since it was sent to the Poor-Law office. Neither has it in anywise been altered or amended, except so far as the usual corrections of the press required.

The lamentable consequences of the Irish epidemic do not seem to be the result of any defect in the Poor-Law, any more than the ravages committed by the Egyptian Ophthalmia among the soldiers of the British Army in 1803 arose from the inadequate resources of the Minister of War, the defective regulations of the Horse-Guards, or the ignorance of and insufficient treatment adopted by the medical officers. In both Tipperary and Athlone, the local guardians were superseded, and vice-guardians appointed; but whichever they are, the guardians of the Irish poor, paid or unpaid, should learn that it is neither justice to those entrusted to their care, nor economy to the rate-payers, not to provide suitable accommodation and other necessaries for the miserable patients, affected with a disease like that on which I have been called on to report. If it were a fatal disease, the result, according to the doctrines of some, might justify the means,—at least the mortality would lessen the expenditure; but it is not so. By this disease, people are only rendered incapable of earning their livelihood, and, in some instances, of ever leaving the workhouse; and so they remain a permanent tax upon the union. It should also be generally known, that blind people are remarkably long-lived. It, therefore, behoves the guardians and local authorities of our Irish unions, calmly and gravely to calculate the probable expense of the support for life of blind persons under twelve years of age, before they allow them to be crammed by hundreds into an unhealthy store or a damp sunken malthouse. To some very philanthropic persons, the doctrine may appear revolting and uncharitable; but it does, nevertheless, appear to me inconsistent to decorate the dead body of a pauper in the paraphernalia of shroud and coffin, merely in compliance with popular usage, while the living pauper is unfurnished with the means of retaining that health and those senses, without which there can be no hope of his ever regaining independence.

Many a good soldier, not slain in battle, has been, and is still, carried to his "rest" with "his martial cloak around him", without exciting the indignation of his comrades! Some outcry may perhaps be made by well-meaning, but uninformed persons, on account of the number of people who have lately become blind in the Irish workhouses. Before, however, such persons come into the field, they should require from the Horse-Guards an accurate statistical return of the number of soldiers who, after a considerable sum of public money has been expended on their training, and, as frequently happens, their transport to the Colonies, are annually invalided, and sent home either totally blind and so

entitled to a pension for life, or partially deprived of vision and furnished with a pension for a limited period; and, be it remembered, the blindness under which they labour has arisen from the very same disease as that which has spread through the paupers in some of the Irish workhouses.

It must be borne in mind, that the observations contained in this paper are of a special, not a general nature; applicable to a peculiar affection appearing under circumstances, and among a class of people, such as neither this nor any other so-called civilized country ever presented before. Did not the late "famine fever," as it was termed, and the dysentery present such peculiarities as never had been observed in any of our previous epidemics? I was called on to report, not on Epidemic Ophthalmia merely, but on the exact condition and the best method of arresting the disease under which the paupers in certain districts laboured. To occupy any portion of this paper with pages of extracts from the writings of Vetch, Saunders, Mackenzie, Lawrence, and others, whose works are accessible to the profession, or to give a *réchauffé* of opinions and descriptions promulgated a quarter of a century ago, would partake more of system-making and book-learning than observation. I shall therefore confine myself as much as possible to facts of which I have been myself cognizant, or of which I have received accounts from credible authorities.

OPHTHALMIA IN THE TIPPERARY UNION.

In compliance with the request of the Poor-Law Commissioners, I visited the Union Schools, the Auxiliary Workhouse, and the Ophthalmic Hospital at Tipperary, upon the 12th of last August, and those at Athlone on the 23rd of the same month. From the evidence which I received, and from my own observations in the neighbourhood of the town of Tipperary, it would appear that an Epidemic Ophthalmia had for a considerable time prevailed among the lower orders in the adjoining country parts. The injurious effects of this disease, in the form of complete loss of one eye, staphylomata, leucomata, opacities of the cornea of various shades, and chronic Ophthalmia, etc., were manifest in a great number of the people I encountered; particularly in those emaciated and broken down in health, whom I saw in the town of Tipperary. Indeed I was strongly reminded during the day I spent in Tipperary, of scenes I witnessed many years ago in the bazaars of Egypt.

From the account given me by the physicians of the Union, it appears that the disease first commenced among the pauper children of the girls' school in the town of Tipperary, in the spring of 1849, and that it went on progressing until October in that year, when it assumed a more violent and decided character, so as to require their being removed for treatment to a separate house, the ordinary hospital of the parent workhouse being so much overcrowded as not to permit of their reception. What number of persons labouring under Ophthalmia were treated in the wards of the workhouse hospital between spring and autumn in the year 1849, I have had no means of ascertaining. A separate hospital becoming necessary for the reception of Ophthalmic patients, the guardians hired an unoccupied house with an adjoining store, in the town, for that purpose. At the time of my visit, it had been given up upon the recommendation of the medical men and the inspector, and the children had been removed to a much more healthy

locality; but I nevertheless inspected it and reported upon it to the Commissioners, in the hope that some means will hereafter be taken by the Poor-Law authorities to prevent the guardians and local officers, many of whom are quite unacquainted with the value of pure air, cleanliness, warmth, proper ventilation, sewerage, and other sanitary matters, in arresting the progress of disease, or contributing to the comfort of the diseased, from again falling into like errors. I am fully conscious of the difficulties which beset this subject, and of the ignorance as well as the apathy which prevail upon it among all classes of the community,—an ignorance and an indifference lamentably exhibited, even in the private dwellings of some of the middle and better orders of society,—as every medical man engaged in extensive practice is well aware. Who amongst us has not daily to enter houses where he is immediately assailed with a stench of sewers, kitchens, areas, and privies? I need not describe the scenes which meet him in his further progress to the dormitories, within the dark confined space of one of which may be found his patient, scarcely visible amidst the voluminous coverings of a feather bed. The bed itself, surrounded by thick close-drawn curtains, is generally one half the size of the room, and the air of the apartment is at times stifling in the extreme. If a Poor-Law guardian is willing to let his wife or child stew out a fever or a pneumonia under such unhealthy circumstances, we cannot expect him to provide wholesome accommodation for the pauper. But the authorities in a distant town or country village can scarcely be blamed for such matters, when we remember the condition in which the poor of Dublin were left at the fever-sheds in the beginning of the frightful epidemic of 1846, until attention was called to the subject by my lamented friend, Dr. Curran. Nor can we well exclaim against guardians and inspectors for defective ventilation in auxiliary workhouses and temporary schools, when, in some of the first-class houses of the metropolis, partial congestion is daily experienced by those who sit out a crowded dinner under the heat and glare of six or eight gas-burners placed in different parts of the room, without a single aperture in the ceiling or walls to permit any portion of the vitiated air to escape!

What is to be done, when an epidemic of an infectious character suddenly either springs up among the people, or spreads within the workhouse or its schools? Separate accommodation must be procured. Tents and sheds have been the usual means employed by Boards of Health and other authorities in such emergencies. For fever and dysentery, these may be applicable during the warm months of summer; but the localities for their erection should be properly chosen, in order to prevent such an accident as occurred at Navan during the last epidemic of fever, when, owing to their exposed situation, several of the fever-sheds were swept away one night, and some of the miserable patients left uncovered during the hours of storm and rain which followed. When an epidemic like Ophthalmia, affecting children and young persons, or when cholera, or any similar disease, which cannot be well treated in temporary sheds, breaks out, the only resource left for those who have to provide for the poor, is to hire a house, the first that can be had; and as few persons are willing, even at a high rent, to let their houses for hospitals, the consequence is, that *of necessity* old dilapidated dwellings long unoccupied, mills, corn stores, breweries, and such other buildings, with low, ill-ventilated lofts, and unprovided with sewers or privies, are really the only ones which can be procured. But still, some of the modern knowledge in sanitary matters, so much boasted of by the learned, and at present occupying both the public mind and the attention of the legislature, should be put in force, to render these buildings as wholesome as possible under the circumstances. I therefore, in my Reports, impressed upon the Commissioners the necessity of appointing some proper officer to see that such matters are strictly attended to, both in the choice of a locality, and in the best mode of turning a store or dwelling-house into a suitable hospital. The majority of guardians in Ireland at present know nothing of such things, and even if they did, might be unwilling to encounter the necessary cost. Inspectors are uneducated in sanitary concerns; and until a course of lectures upon hygiene, somewhat similar to that required in the army, is made a part of the curriculum of education by our schools and licensing bodies, we cannot expect the medical men of the civil service to be thoroughly acquainted with the best mode of applying all the modern improvements of science to the construction of hospitals, their heating, ventilation, lighting, etc., etc. Certain it is, that it would not only be just and merciful towards the poor, but in the end, economical to the rate-payers, to procure the services of a person educated in medicine and hygiene as well as in architecture, in order to fit up these temporary hospitals. I do not consider these observations a digression from the matter in hand, and I have been induced to make them, from the impression which I received on visiting the temporary hospitals provided for ophthalmic patients at Tipperary and Athlone. Upon inquiry at both these localities, why the hospitals which I visited were chosen, the answers were, that they were the only ones which could be procured at the moment;—good; but much more could have been made of them if such a system as I have suggested had been carried out. With respect to the influence of the medical officers of the Irish workhouses generally, it must be remembered that they can only suggest, that they cannot enforce, and they are frequently the family attendants upon the guardians and other officials, as well as the rate-payers, and moreover, that their income is more or less dependent upon these persons.

In answer to a series of questions which I addressed to Dr. W. T. Reardon, the assistant-physician who has had charge of the ophthalmic cases at Tipperary, he informs me, and his answers are confirmed by my own observations, that "the class of patients attacked were debilitated starved female children; generally those recently admitted, worn out by previous want and privation of every kind, many having refused to come into the house in consequence of its crowded state, until they were exhausted to the last degree. Several were admitted this year(1850) labouring under Ophthalmia; some had already lost one eye, and the other was in a state of violent inflammation. The general health of the workhouse was very bad indeed; we had cholera, dysentery, fever, and small-pox, as well as several cases of gangrene and dropsy. There was no proper sewerage, neither was there sufficient water to cleanse the entire house or purify the privies, except what a horse brought daily from town. The vice-guardians got some sewers made; but from these being frequently opened to admit others, the smell from them was very foul. The deaths in the workhouse, since spring, have

been very numerous, the mortality varying from thirty-six to fifty weekly. Few men had the Ophthalmia; I would say, not one healthy man contracted it, and very few healthy women, except the wardmaids."

From October 1849 to March 1850, there were 1525 cases, 848 males and 677 females, treated in the Jail Lane hospital of Tipperary. In consequence of the representations and remonstrances made to the Poor-Law Inspector by the physicians, to the effect that it was impossible to afford the necessary treatment to the unhappy inmates of this establishment, it was closed upon the 18th of July last, and the 302 patients whom it contained were removed to a large building in Meeting-house Lane, also in the town of Tipperary, and which was originally built for a corn store. Although the building used as an hospital in Jail Lane had been given up, and consequently did not contain patients, I conceived it to be my duty to visit the premises, in order to point out to the proper authorities how unsuited it was to the purpose intended, in the hope that, by so doing, the like occurrence might be prevented in future. I likewise entered into a minute description and admeasurement of the newly-formed Ophthalmic Hospital in Meeting-house Lane, shewing that it was improperly ventilated, heated, and lighted, that its wards were, from the very nature of the building, quite too low, and that it was most disadvantageously situated, having but a most imperfect sewerage, not possessing a proper privy, but in lieu thereof, a moveable one, by means of a soil-cart; and that the yard, the only place in which the children could take exercise, was quite too small, being but twenty-four yards long by twenty broad, surrounded by high walls, one of which was the side of the Dysentery Hospital. I pointed out such means as appeared to me absolutely necessary, to render this hospital habitable during the ensuing winter; but I also strongly urged upon the Commissioners the propriety of recommending the guardians to take a country place, the residences of some of the neighbouring gentry (so many of which are now unhappily vacant in Ireland), to which all the children should be removed as soon as possible. In an Essay such as this, it is unnecessary for me to enter into the same minutiæ with respect to those defects in the establishment, as I detailed in my Report to the Commissioners; but it is of great importance that those who are the legal guardians of the poor should understand, that where a vast number of persons, whose health and spirits have been previously broken down by want and privations of every description, are congregated together, attention to cleanliness, diet, clothing, lodging, warmth and ventilation, the means of taking exercise, and some provision for amusement or occupation, is of as much, if not of greater importance than any merely medical treatment that could be adopted. Such treatment, after all, must be based upon some general principle, and cannot, certainly, with the small staff of attendants allowed by the guardians, enter minutely into the circumstances of each individual case. The yard of the hospital, although clean and well gravelled, was totally insufficient for the children to take proper exercise in: I therefore recommended that such of the children as were convalescent should be sent out into the fields daily to play, and that gymnastics and other means of amusement should be provided, until proper accommodation were procured for them in the country.

There had been 241 new cases admitted since the hospital was opened, making in all 2068 cases of Ophthalmia in the Tipperary Union, between

the 29th October 1849, and the day of my inspection,—the 12th of August 1850. I found 340 patients, 170 boys and 156 girls, aged from five to fourteen years upon an average, and 14 adults, in hospital. My first business, after having inspected the premises, was to procure a registry, by means of one or two intelligent clerks, of the name, age, and sex, of every inmate, in order that I might attach such observations to each entry, as would enable me subsequently to draw up a statistical report upon the condition of the disease in the workhouse generally, and on the present effects as well as probable results of the Ophthalmia in each individual case. Without such documentary evidence, I believe it would be quite impossible to make anything approaching to an accurate statement, as to the result of an epidemic of this nature in three hundred and forty cases. Moreover, vague rumours spread with respect to the number of persons who become blind in such and such unions; and, as even medical men will differ on such subjects, and consequent discrepancies appear in reports, I would impress upon persons similarly engaged, the propriety of adopting the means which I have described for registering the cases. And as an unjust outcry of this nature might be raised against the permanent medical attendants, I thought it right that the commissioners and guardians should distinctly understand that the meaning to be attached to being "totally blind" was,—that both eyes had either become wasted and collapsed, or so much disorganized as to render all hope of vision irredeemable. But there are now many persons in the workhouses, with closed pupils, extensive leucomata of the corneæ, etc., the results of the Ophthalmia, at present depriving them of vision, who may hereafter, by treatment or the effects of nature, recover a fair amount of sight. Thus, in those whom one practitioner considers at the moment "blind," another may see a fair hope of recovery by operation or otherwise, and each will, consequently, place such persons in a different category. The admissions into the hospital from the 30th of March to the 20th of August, varied from 17 to 70 weekly, the disease appearing to increase with the warm weather. Statistical statements such as this, where I myself could not have been aware of the facts, were kindly furnished me by the assistant-physician who has had charge of the Ophthalmic Hospital.

In company with the medical attendants, Dr. Evans and Dr. W. T. Reardon, I then proceeded to examine the cases individually, and to consult with these gentlemen as to the treatment to be pursued, and the best mode of arresting the further progress of the epidemic; and with their *sanction* and *concurrence* I addressed to them the letter which will be found appended to this communication, and of which such unwarrantable use has already been made for private purposes. If the Poor-Law authorities, having been officially informed that Ophthalmia is spreading among the inmates of a certain workhouse or its schools, forward a copy of that letter to the medical attendant thereof, it remains for him to judge how far the disease, which I have described, is the same in those persons under his care, and to exercise his judgment with respect to his adopting the suggestions conveyed, at their desire, to my medical brethren in Tipperary.

Among the 340 patients, each of whom was individually inspected, were to be found cases of Ophthalmia or its results in all stages, from those recently affected either with simple conjunctivitis, muco-purulent Ophthalmia, or the more violent and purulent form of the disease, to

those presenting collapsed globes, or staphyloma, either of the cornea and iris, or of the entire eye; but the vast majority laboured under chronic Ophthalmia with granular lids, and a great many presented ulcers of the cornea, some of which had just penetrated, thus allowing a small portion of the iris to protrude. The granulations upon the conjunctival surface of the upper lid were the largest I ever witnessed, many of them exceeding in magnitude the size of a split pea, and some resembled the protuberance which forms upon the end of the divided muscle after the operation for strabismus; or were like the little fungus nail-headed excrescence, which grows from the conjunctiva of the lid in cases of neglected tarsal tumour, attached by a peduncle, and capable of being removed with facility by means of a curved scissars. In some cases, several of these existed along with the general villous or granular condition of the conjunctiva; they were principally congregated above the external canthus; and to such an extent had they grown, in some instances, as to produce a manifest protrusion of the lid, like that seen in ordinary tarsal tumour. Without their removal, it could not be expected that any permanent improvement could take place. A great number of such cases were treated at the time of my inspection, and such remedies were also employed as I have pointed out in my communication to the physicians, and which are therefore unnecessary to be specified here.

The disease which I witnessed in Tipperary, I believe to be a modified form of that denominated Egyptian Ophthalmia; which I have seen, upon a large scale, at Cairo, and in other parts of the Levant; and which committed such ravages in the British army at the time of, and subsequent to, its occupation of Egypt in 1803. It still exists among our troops; and a number of soldiers, both at home and in the colonies, annually lose their sight from it. It has also lingered in particular regiments for years, notwithstanding every effort made to eradicate it, and such regiments having frequently changed climates. In gonorrhœal Ophthalmia, we see it in its worst form in Europe. It used formerly to spread in public schools, particularly Charter-houses; and it has several times appeared in the country parts of Ireland, and extended among the people not then subject to any particular privation, and apparently in previous good health. So long ago as 1701, an epidemic of this nature broke out near Castletowndelvin, in the county Westmeath, by which vast numbers lost their eye-sight.[1]

This Ophthalmia is manifestly contagious, as much so as fever, dysen-

[1] I became aware of this fact in searching through the papers and manuscripts of Sir Thomas Molyneux, whose Memoirs I published in the *Dublin University Magazine* for 1841-2. "From the effect produced, and the numbers who were attacked together, with the time of year at which its attack was most violent, we have little doubt on our minds that it was some virulent inflammatory epidemic, some form of Ophthalmia, and not improbably that known under the name of Egyptian. The paper to which we refer is a list of 'Queries proposed by Dr. T. Molyneux, to John Hill, curate of Castletowndelvin, in the county of Westmeath, concerning the extraordinary distemper that took away the sight of many in that parish.' The answers to this set of questions form a most interesting statistical document, as the name of each person is given, their age, sex, and the exact effect on the sight, whether total loss of vision of one or both eyes, and the whole number who were affected, etc."—*Dublin University Magazine* for December 1841, vol. xviii, p. 753. I have introduced this extract, because I have not access to the original document at present; and, as it is among the family papers, some time might elapse before I could refer to it.

tery, cholera, or any other established contagious or infectious disease, arising from some peculiar state of the atmosphere acting on those who happen at the time to be good recipients for its seeds. Or it may be propagated by direct contact of the matter or discharge from one person to another; and in this mode it is supposed that the nurses and ward-maids of the Poor-Law establishments contracted it. An impaired state of the constitution; broken down health and spirits; sudden alteration in diet; crowding together, particularly at night-time, in large masses; and the want of pure air and proper exercise, have, I think, materially conduced to spread the epidemic in the Tipperary Union. At the same time it must be remarked, that very many apparently healthy children have contracted the disease, and that, in several instances, it was brought into the workhouse by persons from the neighbouring country parts, who at the moment laboured under the affection. When once this disease takes root in a school, barrack, jail, or workhouse, it is always difficult to eradicate it; and, therefore, it behoved me to make known to the guardians, and the Poor-Law authorities, that, under the most favourable circumstances, and among persons previously healthy, even in the better ranks of life, it requires a great length of time, and the most watchful care, to get rid of its effects. Relapses are always of frequent occurrence in Ophthalmia; and, perhaps, from some cause arising out of the peculiar circumstances of the recent calamitous condition of this country, relapses were one of the most marked characteristics of the late epidemic of fever. If the British soldier, well fed, well clothed, accustomed to cleanliness, under strict discipline, previously in rude health, and supplied, not only with prompt medical assistance, but all the comforts and appliances of a military hospital, suffers for months from protracted Ophthalmia, and occasionally loses his eye-sight, how little need we wonder at the ravages committed by it among the miserable Irish peasant children.

The effects of the Ophthalmia may be gleaned from my letter to the Tipperary physicians; but upon the peculiar condition of the conjunctiva, technically denominated "granular lid", I may remark, that it is one of the most frequent sources of blindness among the lower orders in this kingdom, and is one of the most intractable diseases we have to treat. Whether it arises from the humidity of the climate, or the dirty habits and impoverished condition of the poor, it is not easy to determine; but I think more instances of it are to be found in Ireland than in any other country in Europe. It is also one of the causes of entropion, an affection of which there are more cases in Ireland, in proportion to its population, than can, I think, be found elsewhere.[1]

Of the 340 cases which I examined in the Ophthalmic Hospital, at Tipperary, I find, by referring to my notes, made upon the 12th of August, that sixteen persons, ten males, and six females, had irrecoverably lost both eyes, and that in two more they were on the point of being lost; thirty-two persons, twenty-three males, and nine females, had each lost one eye. In thirty-three cases, sixteen males, and seventeen females, one eye had been blemished (generally from dense leucoma, or cicatrix of the cornea, with synechia anterior), so as to impair, but

[1] Out of 512 operations performed at St. Mark's Ophthalmic Hospital during the last three years, 62 were for entropion and trichiasis.

not altogether destroy, vision; and in six cases, three males, and three females, both eyes were in a similar condition;—eighty-seven in all of those submitted to my inspection, where one, or both eyes, had suffered to a greater or less extent. I saw, however, some other cases, in an advanced stage of the disease, where mischief must inevitably have ensued since. Whether these eighty-seven are the entire number of persons, out of the 2068 treated, in whom complete, or partial loss of vision has occurred, I have had no means of judging, as some children had been removed by their parents during the spring; but, if they are, I do not think the number at all remarkable. We all know, that in some instances of violent inflammation of the eyes, even under the most favourable circumstances, it is not possible by art to preserve the integrity of the organ; and twenty cases of total loss of both eyes, or 1 in every 103, is, I think, rather a favourable result. Will medical statistics afford a more favourable? Do 102 cases out of every 103 of inflammation of the lungs, pneumonia or bronchitis; or of peritonitis, etc., etc., recover? Of those persons, where both eyes are, for the present, deprived of sight, but not irrecoverably lost, or disorganized, several may, in process of time, have operations performed with a fair hope of obtaining a moderately useful vision; but this will much depend on the improvement of their general health, and their being removed to a more genial atmosphere.

In addition to the foregoing statistics, the materials for which were collected by myself, the assistant-physician informed me that one hundred and forty-three adults had suffered from Ophthalmia since October 1849; they were chiefly delicate females, and some of the ward-maids and attendants. I have also been informed that, previous to the 29th of October 1849, twelve people, eight males, and four females, were absolutely blind; but they did not come under my inspection.

There prevailed an opinion among the officials, both in Tipperary and at Athlone, that in several cases the Ophthalmia had been induced by malingering; the boys wishing to be freed from school, and to get a better class of food. But, upon strict inquiry, and cross-examining the persons who were said to have first propagated the report, I did not find it borne out by their answers. A few cases of it may have occurred; but it certainly did not prevail to any extent. The means by which the boys in the Athlone Union were accused of propagating the disease—washing the eyes with urine—is, I know, a popular "cure for sore eyes" among the lower order of Irish, particularly in Connaught.

The great bulk of the patients in the Ophthalmic Hospital having contracted the disease in the male and female schools of the union, I next inspected these establishments, and fully reported to the Commissioners thereon; pointing out what I considered defects, and suggesting such improvements as the nature of the buildings admitted. Both the boys' and girls' schools are situated in the uncleanly, ill-sewered, and unhealthy town of Tipperary, which in 1841 contained 7370 inhabitants, and the average proportionate mortality for ten years was, as far as the records of the last census afforded the means of approaching the truth, 1 in 30·8. These establishments had been private residences; the rooms and out-offices belonging to which, together with some additional

buildings recently erected, were converted into schools: but taken as a whole they were, in a sanitary point of view, inapplicable to the purpose. In the boys' school, in Nelson Street, there were 107 children at the time of my visit; but as many as 370 had been located in this establishment shortly before. There was a manifest deficiency of space for exercise-ground for the children. This is an error, not only in a moral but in an economical point of view; for the guardians may rest assured that if a single acre of green-field, properly supplied with a gymnasium, and other suitable means for taking active exercise, were provided in the immediate vicinity of the town (at a cost probably of two or three pounds per annum), wherein the boys and girls of the workhouse schools could play daily, the males at one time, and the females at another, it would save them a large amount of expenditure in hospitals, medicine, and medical attendance. If the children of the rich, in our upper-class schools, require this, how much more do those poor, dispirited, and emaciated creatures, congregated together in masses, and deprived, by their unhappy circumstances, of the sympathy of their natural guardians, demand some such means of healthful recreation. The school hours are from ten to three. Three times a week, when the weather permits, the children are taken out for a walk upon the roads. The food and clothing, supplied to this establishment, were both very good; but neither can supply the want of pure air and active exercise. The chief dormitories were long, thatched apartments, each sixty feet by fifteen, and the walls eight feet high; but the ridge poles of the roofs were sixteen feet from the floor. The ventilation, heretofore provided in these apartments, was, to my mind, totally inadequate; but, shortly before the date of my visit, it had been greatly improved, by means of apertures, made in the side walls, and in the roof. As many as eighty boys have usually slept in each of these apartments; but I was informed that as many as one hundred and twenty-five had slept in a single room of the dimensions I have described. Upon inquiry, the schoolmaster informed me, that "the Ophthalmia *almost invariably attacked the children during the night time, and chiefly those who slept in these very apartments*". In the front house in Nelson Street, which was originally a private dwelling, and in which the apartments were consequently smaller, and much better constructed, with respect to warmth and ventilation, than those I have just described, I was informed that, "there had been but few cases of Ophthalmia". From the 15th of May to the 15th of August, one hundred and ten boys were seized with the epidemic in this school, and removed to the Ophthalmic Hospital.

The means provided for the boys to wash themselves were, it appeared to me, quite inadequate, not merely for cleanliness, but for the maintenance of health; but, as far as I have had an opportunity of judging, the appliances for ablution in the Irish workhouses generally are defective. I need scarcely wonder at the guardians and inspectors permitting the peasant boys in the Irish Auxiliary Workhouses to wash at a pump or with a bucket in the open air in all weathers, when I remember what was the condition of things not many years ago, at one of the largest schools for the gentry in this country—one too on "Royal Foundation". There were no means for washing provided in the large dwelling-house wherein the boys slept; but half-dressed, they scampered every morn-

ing, winter and summer, across an open court or play ground, to an out office, which had recently been a stable, and the floor of which was still paved. There, from fifty to sixty young gentlemen rushed at a large trough, like a manger, in which there were eight or ten basins, and struggled for a wash, and afterwards for the first, or at least a moderately dry wipe with about as many towels. In the Athlone Auxiliary Workhouse, matters were in a still worse condition in this respect, 354 girls and 38 little boys being submitted to the process of ablution, or more properly speaking, of *wetting*, upon an exposed and elevated part of the yard, each morning, on their way from the breakfast-room to the school-room. Every medical practitioner, every mother, every old woman, knows full well what the effects of such sudden chills are in producing inflammations. The children in our workhouse schools are, I believe, very well taught the national system of education, and it is highly gratifying to witness the order, discipline, and regularity which prevails there; but if, besides the marching and counter-marching which they are drilled into (all most necessary I admit), habits of cleanliness and comfort in the matter of ablution were also instilled into these children, would it not forward the process of civilisation in Ireland?

The girls' schools at Bank Place, also in the town of Tipperary, and then the chief source of the epidemic, I inspected and reported on; but in the previous statement and observations, will be found the substance of my report, so far as concerns the objects of this communication, or as the medical profession need be acquainted with. At Grenane, about a mile from the town, there is another girls' school, containing, at the time of my visit, 331 girls, clean, healthy, and in good spirits. There was a plentiful supply of water, the night-soil cart was removed daily, the dormitories, school-rooms, and the entire establishment, were in the highest order. Originally, when the disease first appeared, many cases of Ophthalmia were sent to hospital from this school, but latterly, it had almost disappeared there. The mistress stated, that the disease chiefly attacked the recently admitted children, but that, in several instances, the new comers presented symptoms of the affection on their admission.

The following is the letter which I addressed to the medical attendants of the Tipperary Workhouse, upon the 16th of August.

"Gentlemen,—Pending the presentation of my Report to the Poor-Law Commissioners, respecting the cases of Ophthalmia which I examined upon Monday last, the 12th instant, in the Auxiliary Workhouses, of Tipperary, I beg leave to put you in possession of my views on the treatment which I think it would now be most advisable to adopt.

"Upon the first seizure, if the previous general health of the patient is such as might warrant it, I would strongly recommend slight local depletion, by means of a leech or two applied over the edge of the malar bone, immediately beneath the external angle of the eye, and repeated next day, if the strength of the patient permit it, or if the inflammatory action continue unabated. This refers to young children, the most frequent subjects of the disease. The number of leeches must be regulated by the age and strength of the patient. In adults, cupping the temple and drawing therefrom three or four ounces of blood, will, I think, be

found beneficial in mitigating the severity of the original symptoms. Where there is much swelling of the lids, cold applications are generally found most grateful. I highly approve of your judicious use of the nitrate of silver; but I would suggest the propriety of keeping a solution of that medicine in a separate vessel in each ward, and having it so managed as to exclude as much light as possible; for the dark precipitate thrown down by decomposition, gives, when applied to the eye, unnecessary pain, and it is far from beneficial. I see no objection to your employing a solution of this medicine as strong as six or eight grains to the ounce, in the very early stage, when the conjunctivæ of the lids becomes villous and pulpy, and pours out in great quantity a thin muco-purulent discharge, and when that covering the globe is raised up into a serous chemosis. But as soon as ever the symptoms of intense inflammation subside, I would lessen the strength to about three grains, or even one grain to the ounce. In cases, however, where you think it advisable to employ the weak solution, it ought, I conceive, to be used more frequently, say three times in the twenty-four hours. The nurses should be taught how to apply this remedy.[1]

"With the exception of some mild aperient, given at the commencement of the attack, in those cases where the tongue is white, or loaded, I do not think that much benefit is to be derived from purging the class of patients you have to deal with; neither do I see much good likely to accrue from lowering them by means of tartar emetic, the patients which will bear such being evidently the exceptions. If a warm bath can be easily obtained, I think good will ensue from its use; and, in the treatment of the subsequent chronic stage, I am sure you will find it very desirable; but it must be properly managed to be effectual.

"As soon as local depletion has been had recourse to, the bowels freed, the bath used, and the solution of nitrate of silver dropped into the eye, I should strongly advise you to administer cinchona bark, and give it liberally, particularly during the subacute stage.[2] The decoction, with a little of the syrup, will, I think, be the most easily obtained preparation, and the most applicable to a large institution.

"As far as the patients are willing to take it, I would recommend

[1] Wherever in this Report recommendations are made, or suggestions offered, upon subjects of apparently trivial import, it is because some good reason for my doing so presented itself at the moment. It must be remembered, that the nurses and ward-maids of an Auxiliary Workhouse Hospital are themselves pauper inmates, generally very ignorant, and totally unacquainted with those matters familiar to the usual nurses of general hospitals.

[2] It has been asserted, with what degree of propriety the profession are to judge; that as inflammation of the conjunctiva, commonly called purulent Ophthalmia, in its simple and uncomplicated form, proceeds through its different stages to perfect recovery, unaided by any medical interference, we should refrain resolutely from any officious meddling with the disease, etc. How far this line of practice is applicable to inflammations in other organs in their mild uncomplicated form,—simple inflammation of the mucous membrane of the lungs, throat, bowels, or the genito-urinary organs, for instance,—those who are extensively engaged in practice are alone capable of forming an opinion. Every one who visits the continental hospitals has an opportunity of judging of the positive results of the *expectant treatment* in inflammatory diseases. Not long since, the profession witnessed the decay of a periodical wherein such doctrines were broached; and their promulgation now only proves that some persons have outlived all faith either in medicine or themselves.

plenty of nutritious food, good wholesome bread and milk, or stirabout and milk, as well as some broth containing fresh vegetables, during the day. In the treatment of these cases now in hospital, as well as in the regulation of the dietery of the schools where the disease has been acquired, I would suggest to you the propriety of varying the description of food from time to time. Properly cooked potatoes, instead of the usual meal of brown bread, would, I am sure, be considered a luxury, and tend to keep the children in good health. Although the patients in the Ophthalmic Hospital may, from its sweetness, prefer tea to milk, I would not recommend you to accede to their wishes generally, but I think the use of cocoa, made of a proper strength, and given with an equal proportion of warm milk, and some sugar, would be both palateable and nutritious.

"From what I saw of the disease, and from the account which you have given me, it is manifest that it is, in the first instance, amenable to treatment; few cases having occurred in which the cornea sloughed, or the eye burst, through the violence of the primary attack. The great majority of cases in which permanent or irreparable mischief has occurred, seem to be those in which the cornea ulcerated, and the iris protruded, subsequently to the original attack, producing either staphyloma, or extensive leucoma, with adhesion of the iris to the cornea. The treatment of such ulceration will, no doubt, greatly depend on the appearances presented in each individual case; but, as such affections are nearly always induced by some constitutional derangement, such other means of strengthening the system as circumstances will permit, must also be employed. Where the patient is much broken down, and the disease is in a chronic stage, I beg to suggest the plentiful use of cod-liver oil, of which medicine a large supply should be at once procured, and a table-spoonful given to each child two or three times a day. I saw, I am sure, fifty cases, among those under your care, which would be greatly benefited by the use of this remedy. It is most applicable to those cases in which there is much emaciation, paleness, a cold clammy skin, and large flabby granulations, and sometimes transparent ulcers of the cornea.

"As the great tendency of this disease is to cause exuberant growth of the conjunctiva, presenting various kinds of granulations, which form the sequelæ of the affection, I would advise you in every instance, as soon as the swelling of the upper lid has subsided, and the more urgent symptoms have passed away, to evert the lid in order to examine the state of its conjunctival lining, and to apply the solution of nitrate of silver directly to that part, and then, by keeping the lid thus retained for a few seconds, until the caustic has acted upon the swollen villous surface of the membrane, granulations may be prevented from forming.[1]

[1] To evert the upper eyelids, in order carefully to examine the diseased conjunctiva, and to apply suitable remedies, in some hundred cases once a day, or even every second day, in addition to the ordinary attendance necessary upon a large workhouse, requires an amount of time which few medical men could give, or the Board of Guardians would be willing to pay for. Still it was my duty to point out what I conceived to be necessary; but, at the same time, I recommended the Poor-law Commissioners to advise the guardians to furnish additional medical attendance.

"With respect to the local treatment of the ulcers,—several of which were transparent, as if a piece had been chipped out of the cornea,—I would recommend you to touch them with a solution of nitrate of silver, of the strength of about four grains to the ounce, applied with a fine camel-hair pencil. These ulcers seem to me to penetrate the cornea from want of power, in the neighbouring parts and the constitution generally, to repair the mischief, few, if any of them, presenting the usual vascular connexion with the adjoining conjunctiva and sclerotic, which is commonly set up to restore the breach. I saw several instances in which the cornea had just been ruptured, and a small portion of the iris protruded. These cases, if allowed to proceed unchecked, will inevitably go on from bad to worse. The aperture in the cornea enlarges, and a considerable portion of the iris protrudes, and the final result is either partial or complete staphyloma, or an extensive leucoma, the whole or a large portion of the pupil becoming attached to the cicatrix. In such cases, I would recommend that, as soon as you perceive that the ulcer has penetrated, you should touch the knuckle of protruding iris with a very fine brush, wet with a weak solution of nitrate of silver, and immediately afterwards drop into the eye a solution of atropine, of the strength of two grains to one drachm of distilled water.[1] The eyelids should then be fastened down with narrow strips of adhesive plaster, and a piece of fine lint plentifully smeared with a moistened extract of belladonna should be applied over the eye, and retained in this position by a light bandage. From the crowds at present in your hospital, and the liability of cases so circumstanced meeting with any accident, I would recommend to have them confined to bed. The eye should not be opened for the next four days; but, as the lint becomes soiled and stiff with the discharge, it may be changed as often as necessary, and fresh belladonna applied round the orbit.

"In cases where ectropeon of the upper lid has taken place during the violence of the original inflammation, great care should be taken to restore the lid to its natural position, as it sometimes remains in a most distressing condition for weeks, and even months, of which, at present, you have some examples in the hospital.

"The foregoing observations refer to the more active forms of the

[1] The treatment recommended above I published in my Ophthalmic Report for 1848 (*see Dublin Quarterly Journal*, vol. v, p. 489). Since then, I have had many opportunities of testing its value; and the pupils in attendance at the Ophthalmic Hospital have frequently witnessed its efficiency during the last few months. To state that belladonna or its alkaloid will not cause a knuckle of iris protruding through a recently opened ulcer or rent in the cornea to retract, and the pupil to expand, exhibits a want of practical knowledge of ophthalmic surgery. It is to be regretted, I think, that atropine, one of the most powerful salts, and one of the most efficacious remedies with which we are now acquainted,—far more cleanly and much more certain than belladonna,—has been omitted in the recently published Dublin Pharmacopœia. Since I first brought the use of this remedy under the special notice of the profession in this country, I have found that, in some cases, a single drop of a solution of the strength of two grains to a drachm, consequently about the thirtieth part of a grain of atropine, will, if dropped upon the conjunctiva of the lower lid, be perceived, by its bitter taste in the mouth, in a quarter or half-an-hour after its application. Where it has been necessary to use this remedy for some length of time, as in cases of contracted pupil, or central cataract, etc., an unpleasant dryness of the fauces is experienced, in addition to the usual bitter taste. Isinglass plaster, made on firm sarcenet, is preferable to the common sticking-plaster for fastening down the eyelids.

disease. I have now to give you my opinion of the chronic cases, which form the great majority of those submitted to my inspection. In the observations which it is my duty to make, and the recommendations which I suggest for the removal of those errors which it appears to me have been committed, and still exist in the general management of your ophthalmic hospital, I beg to state that I am well aware that it is not within your power to rectify them. Their removal I will strongly impress on the Commissioners, but, at the same time, it is proper you should always bear them in your recollection. The wards of the hospital are much too low, and far too many patients are crowded into them. The ventilation is both irregular and inadequate. The clothing of a great number of the children is insufficient. During the approaching cold weather, some means for heating the wards must be procured, and the unglazed windows must, in inclement weather, be properly secured. Cleanliness is not sufficiently attended to; three sponges are not enough for a ward containing nearly one hundred patients; there should be at least a dozen sponges, and the elder children should be shown how to use them themselves, and compelled to do so several times a day.[1] For the recent cases, where the discharge is believed to be infectious, I would recommended the use of small portions of tow instead of sponges, as a fresh supply of the former could be had daily at a very small expense. I do not think three night buckets sufficient for the number of patients in each ward; there ought to be at least five or six. The removal of excrementitious matter, and the cleanliness of the privy, has not been sufficiently attended to; you should insist on having the ordure cart removed daily. At the time of my inspection, the bedding, particularly the sheets, were not so clean, and consequently not so healthy, as you are aware they ought to be.

"I will strongly urge upon the Commissioners the necessity of immediately procuring some country place to which the ophthalmic patients may be removed, and where they will have a constant supply of fresh air, and be able to take open air exercise (if possible, in a green field, instead of a confined yard); without which means, neither medicine nor any effort on your part will prove available in a great number of cases.

"I would suggest the advantage, both to yourselves and the patients under your care, of making some classification of them according to the severity of their symptoms, and thus prepare the way for lessening the number of children in the establishment. I saw several patients with slightly granular lids and some mucous discharge from the eyes, but without any active inflammation of the conjunctiva of the globe or any intolerance of light, who might at once be removed, if a proper place were provided for them. As the disease is not likely to be infectious in that state, they might be sent to the parent workhouse or back to school, provided they were not confined, nor employed in learning five or six hours a day, which I find is the time the children have been occupied in the schools where the disease was originally contracted. In treating those mild forms of chronic Ophthalmia, I think you will find it beneficial to use the wine of opium made without aromatics, and mixed with an equal quantity of laurel water, dropped into the eyes once a day.[1]

[1] I think we are in the habit of allowing patients with inflammatory affections of the eyes to *stop* too much, either by steeping, or keeping on a wet rag for hours together. I am convinced that much greater benefit will be derived by fomenting the eye properly, or applying a cold lotion by means of a fold or two of fine linen for a quarter of an hour at a time, and then carefully drying the part.

"Chronic Ophthalmia, kept up by a granular condition of the conjunctiva of the lids, chiefly the upper, is now what you have principally to treat. By making the following classification, and by getting a registry constructed in accordance with it, you will, I think, be able to get through your work more easily. If, moreover, each class could be kept in separate wards, it would, I think, hasten their cure. Until another house is provided, the present large wards might be divided by temporary partitions.

"Class I. All the recent cases, before they have passed into the chronic form. They should, if possible, be at the top of the house.[2]

"Class II. The totally and irrecoverably blind. These had better, I think, be separated from the rest of the patients.

"Class III. All those with ulcers of the cornea, protrusions of the iris, or staphyloma not producing blindness. In recent cases of staphyloma of the cornea projecting through the lids, and causing much irritation, I would recommend you to tap the protruding part with a flat needle every now and then, so as to lessen its bulk and remove the pressure made by the contained fluid. A light pad, made to exercise some degree of pressure on the eye, while this mode of treatment is being adopted, I have known to prove beneficial. In all cases of recent adhesion between the cornea and iris, I would recommend the continued dilatation of the pupil by means of atropine or belladonna. In cases where complete closure of the pupil exists, but in whom the operation of artificial pupil may hereafter be resorted to with some hope of success, equal care, both to improve the general health and to remove any disease existing in the eyelids, should be taken as in those already described.

"The first and third classes should be visited daily, the second but every third day.

"Class IV. With small hard granulations, generally distinct and separate. These I would recommend to be touched in the manner I pointed out to you every second day, with sulphate of copper; they need not be examined upon the intermediate days. The constitutional treatment, by means of bark or cod-liver oil, should be employed in several of these. Where there is much intolerance of light, irritation of the membrane of the external nares, and swelling of the upper lip, with other strumous manifestations, I would recommend you to use, in connexion with the bark, very minute doses of the oxymuriate of mercury, say the sixteenth to the eighth of a grain. Such cases will also be benefited by the application of a blister to the vertex; but blistering, in the generality of cases, such as those I witnessed in your ophthalmic hospital, will not, in my opinion, prove beneficial. I do not think the usual bitter infusions, or even hydriodate of potash, improve such cases, or indeed many cases of ophthalmia in young persons; but some benefit may be derived from the use of the syrup of iodide of iron, particularly in very young children.

[1] The removal of the hot spices from the wine of opium is, I find from long experience, a great improvement, when this tincture is used as a collyrium. This formula has, I am glad to find, been adopted by the compilers of our new National Pharmacopœia.

[2] The treatment of these recent cases has been described in the commencement of this letter.

"CLASS V. With large distinct granulations, such as those you saw me remove, and which principally congregate at the sulcus, formed by the reflection of the conjunctiva from the upper lid to the globe. These cases should be seen and their lids everted daily, and as many of the granulations as possible cut off with a curved scissars. The inner surface of the lids may occasionally be scarified slightly, and the bleeding, which will prove rather beneficial, should be encouraged by fomentation with warm water. Besides the removal of these large granulations, some local astringent should now and then be employed as the granulations disappear, such as the sulphate of copper, solution of nitrate of silver, or the acetate of lead, which latter I shall presently allude to. The constitutional treatment of such cases is even more necessary than in the foregoing class. From week to week, cases of this and the 4th and 6th classes may be removed into the 7th class, which will not require such constant attendance.

"CLASS VI. Are those in which the conjunctiva presents an uniform granular condition, the surface of the granulations, however, being tolerably smooth, although they may be separated by passing a probe between large packets of them. They are generally less florid than in the preceding class, and the patients are always run down in health. They will require an energetic constitutional treatment, with as much animal food as the dietary of the institution will permit. Ulceration of the cornea exists in a great number of these cases, presenting the appearance of an abrasion of its surface without any surrounding greyness. The local treatment which I think you will find most beneficial in these cases, is to unload the deeply congested purple granulations by very light scarifications, and, in a day or so afterwards, to apply finely levigated acetate of lead. For this purpose the lids should be everted, their internal surface gently dried, and the lead applied either with the top of the finger, or a camel's-hair pencil, so as to completely cover over the exposed surface. The lid should be still held firmly everted for at least a minute, during which time the lead will have dissolved, and the granulations will have changed colour very considerably, assuming the hue of an unripe mulberry. The parts should then be washed free of the application with a little clean water, either by means of a syringe, or a sponge. It will not be necessary to examine these lids again for three days. As there is an opinion that lead is deposited, and leaves a permanent stain, where there is any breach of surface in the cornea, perhaps it would be as well to confine this application to the cases where ulceration does not exist, using the solution of nitrate of silver, applied after the same manner in those where ulceration is present. After one or two applications, the lead will form a sort of enamel, of a whitish colour, and of great smoothness, over the surface of the lid. As long as this is present, it should not be interfered with, nor the remedy re-applied, except to such spots as it has not taken effect upon.[1]

[1] This mode of applying finely powdered acetate of lead to the hypertrophied villi of the palpebral mucous membrane has been highly recommended by Dr. Buys, a Belgian military surgeon and the results of his observations have been published at length in Dr. Cunier's excellent journal, the *Annales d'Oculistique*. A form of Ophthalmia, very similar to that now prevailing in the Irish workhouses, has recently spread among the troops in Belgium, and also extended through the public institutions, and among the lower orders in that country; on which several valuable reports have been published in the periodical alluded to. The action of powdered acetate of lead is not the same as that of the liquor plumbi, even in the undiluted state. Even though it were, the mode of applying it would produce a different result. Every one engaged in Ophthalmic practice knows full well that any fluid caustic, or astringent, simply dropped into the eye with the palpebræ, generally at the moment spasmodically contracted, exercises but little influence on the inner surface of the upper lid. To prove effectual, the substance, fluid or solid, must be applied to the membrane itself.

"CLASS VII. Are those with simple uncomplicated chronic Ophthalmia.

"I would, as soon as proper accommodation and other means are supplied by the Poor Law guardians, or the Commissioners, completely separate all those who are totally and irrecoverably blind from the rest of the patients. As soon, also, as possible, some description of amusement should be procured for the children, who should be kept upon fine days as much as possible in the open air, or in a large airy day-ward in wet weather. Fortunately, there being so little intolerance of light in the great majority of the cases your hospital presents, the children will always be able to do this. I have been very much struck with the circumstance of there being so little development of scrofula in the children affected with the present epidemic Ophthalmia in Tipperary; only two or three instances of enlargement of the glands of the neck presenting in 350 patients; a fact of some interest, as tending to show the purely epidemic nature of the disease, and to distinguish it, even in the chronic form, from that generally denominated Scrofulous Ophthalmia. It also appeared to me remarkable that only one or two instances of Pannus, or vascular cornea, such as that which so frequently occurs as the consequence of Ophthalmia in the army, were to be seen in the vast number of cases under your care, and in several of which sufficient time had elapsed to permit of the formation of such appearance. This circumstance, I think, tends to show the asthenic nature of the disease you have had to treat, and the broken-down class of subjects in which it has appeared. Extreme coldness of the end of the nose is a symptom which I have long observed to be attendant on chronic Ophthalmia with granular lids, in debilitated patients, and it was to be observed very frequently among the children in your Ophthalmic Hospital.[1] To such cases the cod-liver oil is peculiarly applicable. The total absence of all other ophthalmic diseases, except the purulent Ophthalmia, and its consequences, was most remarkable; and the circumstance is fortunate, as, had the internal structures of the eye partaken in the inflammatory action, the disease would have been less under control, and the usual remedies, mercury in particular, inapplicable to the class of patients you have had to deal with. Of pustular Ophthalmia, so common at present among children and young persons, I did not see a single instance either in the hospital, or among the numerous pupils, males and females, whom I saw in the schools.

[1] Coldness of the extremity of the nose is an attendant symptom of chronic Ophthalmia; just as much as congestion of it is characteristic of affections of the choroid or the internal structures of the eye; or swelling, redness, and an eczematous eruption, of the external nares, the septum, and the upper lip, is a constant attendant on certain forms of scrofulous Ophthalmia. To deny such, exhibits either defective vision, or undeveloped powers of observation.

In several cases at Tipperary, enlargement of the pre-auricular gland—*Bubon pre-Auriculaire*, first noticed by Dr. Hairion, of Louvain, as an attendant symptom in gonorrhœal Ophthalmia, was observed. But, as we already stated elsewhere, it is common to other forms of ophthalmic inflammation besides the specific.

"As the yard of the present establishment is so confined, I would strongly suggest the propriety of sending forty or fifty patients, under the superintendence of a proper care-taker, to a little distance into the country every day. Two hours of freedom in some of the neighbouring green-fields daily would be of great benefit to the poor children cooped up within the narrow limits of the hospital, and would be an eventual saving to the guardians and rate-payers in the items of medicine, medical attendance, hospitals, and the subsequent permanent support of a number of blind people. There are several patients in your hospital whose sight might be saved if they were completely removed from the establishment, and placed under the care of their friends in the country. But this is a matter on which I do not possess sufficient information to be able to suggest any decided step. If, upon the breaking up of your present establishment, and the removal of the patients to a more healthy locality, you could by any means get rid of the fleas which swarm in the beds, and literally cover the sheets with minute specks of blood, it would, I think, tend to improve the health, and minister to the comforts of the miserable patients you have to treat.

"As it will be necessary to examine each individual case of the 350 now under treatment, to evert the eyelids and apply the necessary remedies, as well as prescribe medicine, and regulate the dietary, once in three days at least, and in some cases daily, I will recommend the Commissioners to afford you additional medical assistance as soon as possible. Until, however, some more healthy locality, with sufficient ground for enabling the children to take exercise, is supplied, I do not think any general improvement will take place in those under your care."

Dublin, 16th August, 1850.

OPHTHALMIA IN THE ATHLONE UNION.

In accordance with the directions of the Poor-Law Commissioners, I proceeded to Athlone upon the 23rd of August, and, in company with the physician and the master of the workhouse, I visited the different localities where I was informed that patients labouring under Ophthalmia existed; and also carefully inspected the schools, where the disease is said to have originated. As the remarks, which I thought it my duty to make upon this disease, its apparent cause, and its treatment in the Tipperary Union, were equally applicable to the circumstances of the Athlone Workhouse, I did not consider it necessary to extend my report upon the latter to the same length as the former, but contented myself with pointing out what I considered the most striking defects in each section of the auxiliary workhouses; and I also "suggested to the Commissioners the expediency of furnishing copies to the officials at Athlone, both of my letter to the medical attendants of the Tipperary Union, and also of my general report" thereon. I pointed out, in as strong terms as language at the moment supplied me with, what I considered to be manifest defects in the warmth, ventilation, cleanliness, mode of washing, and the general accommodation of the several establishments through which I was conducted. It appears, from the public prints, that the Board of Guardians at Athlone have been put in possession of my opinions and suggestions; to what extent they have availed themselves of these I know not, and, except for the sake of humanity and the credit of my countrymen, it concerns me not to inquire.

At the time of my visit, the disease or its effects were to be observed

in the girls' school, in a temporary hospital, in the boys' school, and in the Infirmary, and the Fever Hospital, these latter being within the precincts of the parent workhouse. The first of these establishments, denominated No. 1 Auxiliary Workhouse, had formerly been a private residence; it contained 354 females under fifteen years of age, and 38 males under five, who were in an infant school attached thereto. Upon inspection, I found that numbers of the children here laboured under the Ophthalmia in a chronic stage; some, the very young children particularly, were just as severely affected as those in the hospital at Tipperary, the same peculiar effects exhibiting themselves, in exuberant growths of the lining membrane of the lids, etc.; but ulceration was not so common. Upon these effects and the best method of treating them, I consulted with the medical attendant, Dr. O'Connell, who accompanied me in my visit. The matron of the establishment had been supplied with a bottle containing a solution of lunar caustic, and she seemed to have been well instructed in the method of applying it; but I believe it will be conceded, that, in order to arrest the progress of this disease, and to counteract its effects in a chronic stage, it is absolutely necessary that a medical inspection of a great number of the children of this or any other school, when it prevails, should be made every five or six days at least, and their eyelids everted, in order carefully to examine the state of the conjunctiva, and to employ such remedies as may be deemed advisable at the time. Those labouring under severe chronic Ophthalmia with granular lids, I recommended to be separated from the others. Several of the cases here seemed to me to require active constitutional treatment, in order to correct the tendency to relapse, and to assist in eradicating the disease from the establishment.

Generally speaking, the girls in the Athlone School appeared to be much more healthy than those either in the school at Bank Place, or the Ophthalmic Hospital of Tipperary. Moreover, very many of them were of a somewhat different race, having dark eyes and complexions, and consequently presenting fewer instances of the deleterious effects of ocular disease.

All forms of external Ophthalmia seem to affect light-haired people with blue or grey eyes and delicate skin, and particularly those with what are termed sandy complexions, more than those with dark complexions and brown or hazel eyes; and such diseases likewise produce, in the former, more violent symptoms. Of 1659 cases of external inflammation, including conjunctivitis in different forms, pustular, catarrho-pustular, strumous, and purulent Ophthalmia, etc., registered at St. Mark's Hospital during the last three years, and in which the colours of the irides were accurately noted, 1155 were light-coloured, grey or blue; and 504 brown or hazel; being in the proportion of about 9 to 4. It must, however, be borne in mind, that light-coloured eyes, the blue-grey in particular, predominate in this country. The most marked difference occurred in the cases of pustular Ophthalmia, where there were 272 light, and 152 dark coloured; and in strumous Ophthalmia, generally marked by intolerance of light, etc., there were 267 light-coloured, and only 107 brown or hazel eyes.[1]

Forty-nine children in this school had, at the time I visited it,

[1] See Fourth Report of the St. Mark's Ophthalmic Hospital and Dispensary for Diseases of the Eye and Ear. Dublin: Alex. Thom. 1850.

suffered severely from the effects of the Ophthalmia, but in only two instances had both eyes been irrecoverably lost; two more had both eyes seriously injured, but in these latter, vision may in time be restored by operation; twenty had each lost one eye; twenty-three had each one eye seriously injured; and two had slight opacity of the cornea. In passing, however, through the school, I observed very many children with chronic Ophthalmia and a villous or granular state of the lids. It would appear that the disease had been, in the first instance, even more violent than in Tipperary; but, perhaps from the difference of race, the better state of the general constitution of the children, and the more healthful situation of the school, the subsequent consequences—chiefly intractable ulceration, kept up by an impoverished state of the constitution—were not to be observed in No. 1 Auxiliary Workhouse in Athlone: but then it must be observed, that some of the worst cases had been removed to the infirmary of the parent workhouse. The epidemic appeared to be on the decline, only two cases having occurred there during the three days previous to my visit. I understand that the disease broke out among the paupers in the Athlone Union, in April 1848, instances being at the same time observed in the surrounding country parts, and in the town of Athlone; and that 470 cases of it had been treated in the Workhouse during the twelve months previous to last August.

Having pointed out, in my Report to the Commissioners, the defects of the various establishments at Athlone in which the disease had sprung up, or then existed, both in the dormitories and dining-rooms, and remarked upon the general management of these institutions, it is unnecessary for the purpose intended, here to recapitulate them: but, as some notice of the following circumstance has already appeared in the newspapers, I here transcribe from my notes what occurred, in the hope that the like neglect may never again be permitted. Upon inquiry as to the mode of washing the children, I was informed that the process was then going forward. Furnished with an umbrella, for it was raining at the time, I proceeded to the spot, and found two of the adult female paupers, each with a bucket of water before her, standing upon one of the highest and most exposed portions of the yard, and which commanded an extensive view of the adjoining river Shannon, and the damp, swampy ground beyond and around it. The children, according as they breakfasted, crept along an adjoining wall for shelter on their way to the schoolroom, which was at a considerable distance; and as each child came up, one of the washerwomen laid hold of it, pulled down its dress in front and behind, and bending it over the bucket, threw some of the cold water with her hand upon the face, neck, breast, and shoulders of the little girl, and then gave her a scrub with the open hand. Sometimes the child escaped before the process was completed, and ran off with the water trickling from its hair and down its neck; in other instances, the children were dried with their own dresses. There were no towels there; and, upon inquiry, I found that but two had been supplied by the guardians for the entire establishment. The matron and the schoolmistress, who were present, and who were exceedingly intelligent, pains-taking persons, and apparently very humane, and anxious about the children, seemed quite unconscious of the deleterious effects likely to ensue from this mode of ablution and exposure of the body in the open air. I pointed out to the physician who accompanied me, the

great likelihood of such a chill producing Ophthalmia in weakly children already predisposed to it, and in an institution where it was manifestly an epidemic. The children should be washed and properly dried in some unexposed apartment, or their dormitories, immediately upon their rising in the morning, and not after breakfast.

No. 2 Auxiliary Workhouse, now used as an additional infirmary, was originally a malt-house, and is situated in a confined, damp situation, bordering the river, probably in order to facilitate the germination and fermenting process of the corn. From the construction of the building, its low vaults, narrow passages, and very scanty rooms, I conceived it to be totally incompatible with the maintenance of health in any persons confined within it. It was, moreover, in some parts exceedingly uncleanly. I suppose we must attribute to apathy and indifference,—consequent upon familiarization to scenes of misery and destitution—the circumstance that the guardians and the inhabitants of Athlone generally suffered such an establishment as this to exist. The patients in this hospital were chiefly cases of dysentery and Ophthalmia. Of the latter, there were fourteen; and of these, eleven boys, aged from 8 to 13, presenting the worst cases which I witnessed any where, miserable-looking creatures, squalid and ragged, slept on boards laid directly on a damp floor in a sort of cellar or dormitory 33 feet long, 10 broad, and 7 high, with unglazed windows facing a yard surrounded by high walls, and only 25 feet square. This inclosure was the exercise-ground for these and about twelve other boys located in the same establishment! These are defects in an institution intended for the improvement of health which, it seems to me, a medical man sent to inspect, is imperatively called on, both in justice to the inmates and to the authorities, fully to describe. Of the eleven boys in this apartment, three had lost both eyes, three had lost one eye each, and the remainder had one or both seriously injured. In such cases, medicine can be of no avail; I therefore strongly recommended that they should be removed to a more healthy locality, and that all the boys in this establishment—numbering about thirty-three—should at once be sent to some auxiliary house in the country, or as many as possible taken into the infirmary of the workhouse. In making a selection for this purpose, the curable cases alone should be removed, as it would be unfair to occupy a bed with an irrecoverably blind patient to the exclusion of one who had still an eye to lose.

I visited the boys' school at the Workhouse, and was informed that no fresh case of Ophthalmia had occurred among the children there for three weeks; several, however, had slight chronic Ophthalmia, and of seventeen whom I had subtracted from the rest as having suffered from the recent epidemic, two had lost both eyes, and seven, one each. The remainder had impaired vision in one or both; but it was stated that some of the children with blemished eyes, both here and at the girls' schools, had had Ophthalmia at their own homes, and had been received with blemished eyes. These boys did not look as healthy as the girls I have just described, and this school presented a much greater proportion of the fair complexioned. The clothing was insufficient; but the sleeping apartments of these children were clean, comfortable, airy, and in the highest order, which will, I think, account for the comparatively few cases of Ophthalmia which have occurred in this school.

In the Fever Hospital, there were several suffering from Ophthalmia in all its stages. Of twelve girls, two had irrecoverably impaired vision of the right eye; four boys had each lost one eye, and two others had extensive leucoma of one eye. Two adults had each lost both eyes. In the infirmary, there were twenty-one cases of Ophthalmia more or less severe; three of these had each lost one eye.

The epidemic seemed upon the decrease. There was but one recent case of severe purulent Ophthalmia at the time of my visit. Upon examination, the inside of the upper lid was found to be covered with an adventitious membrane of recently organized lymph, such as that which other mucous surfaces pour out in the early stage of excessive inflammation—in croup and diphtheritis particularly, and probably in dysentery also. In cases of suppuration of the eyeball, I have seen it formed over the entire surface of the chemosed conjunctiva in the space of twelve or fourteen hours, and so firm and extensive as to permit of its being taken off *en masse* with a forceps. The existence of this pseudo-membrane, particularly in the Ophthalmia of new-born infants, was pointed out some years ago by M. Chassaignac. A similar appearance has been observed in other epidemics of Ophthalmia in different parts of Europe and in Egypt, and it was very manifest in the severe Ophthalmia which recently prevailed in Belgium. I think it should be removed as soon as possible with a camel's hair pencil, and the surface then washed over with a strong solution of nitrate of silver, a practice which proves so beneficial in certain inflammations of the pharynx.

The physician agreed with me in the propriety of the treatment which I recommended, and which was nearly the same as that pointed out in my letter to the medical officers of Tipperary; viz., slight local depletion in such cases as would bear it, the use of astringents, attention to the state of the digestive organs, and then supporting the strength and improving the general health by nutritious diet, pure air, and the liberal use of tonics, particularly bark and cod-liver oil. According to my experience, a couple of leeches, applied in the neighbourhood of the affected eye in a child, is not only much more effectual in arresting the progress of the inflammation, but also much less exhausting to the patient's general strength, than a large blister placed upon the nape of the neck or between the shoulders. When blisters are applied behind the ears, or in the immediate vicinity of the affected organ, as on the side of the cheek or the temple, they cause, in young children particularly, great irritation and restlessness, and often give rise to eruptions on the face, difficult to cure. It must, however, be remarked, that where leeching is to be used in many cases, it will require a larger staff of attendants than is generally allowed for Poor-Law Hospitals. The system of purgation is too liberal in many of our public institutions. In catarrhal or muco-purulent Ophthalmia in children in this country, the tongue is, upon the first accession of the disease, generally coated with a thick, putty-coloured exudation, through which the bright red papillæ stand up prominently; and the better state of health the child has been in previously, the more marked is this symptom. Hence, the well-fed children of the middle classes more frequently present it than those of the poor. In such cases, the digestive organs demand special attention. But we frequently meet cases among the lower orders where the tongue is quite clean from the very first, nay, is

often unusually florid, and these will not be benefited by purgation. In relapses, even among the most robust children, the tongue is seldom so foul as in the original attack. Where the Ophthalmia has suddenly —as in the course of a few hours—seized a person, the tongue is seldom much loaded. In Tipperary and at Athlone, the prevailing character of the tongue in those sub-acute and chronic cases which I inspected was either pale red, or like the surface of a piece of macerated liver.

Before I conclude this report upon the Ophthalmia in Athlone, I beg leave to append the following account of a similar epidemic which prevailed in the 31st Regiment, while stationed in that garrison, for which I am indebted to my friend Dr. Massy, the Assistant-surgeon of that corps. "The regiment suffered slightly from Ophthalmia at Manchester, and also after its arrival in Dublin, where we left all our cases of Ophthalmia. We reached Athlone in July 1848, but we had also several men in the ranks with tender eyes, and these I always thought it would have been well to have separated from the rest. At head quarters we had 730 men; and two detachments, one of 90, at Roscommon, and the other, of 50, at Lanesborough. Soon after reaching Athlone, Ophthalmia became very prevalent among the troops, and we had generally forty cases in hospital at a time. All through the winter its spread was very gradual; and as an idea was entertained that its existence was attributable to the men themselves, it is possible that sufficiently energetic means were not employed to arrest its progress. At least, so I believed. The men were constantly kept at their duty, and no precautions taken for separating those slightly affected and convalescent from the others. In the following spring, about May 1849, the disease had regularly got hold of the regiment, and then I suggested the propriety of inspecting the troops daily, when all cases shewing the slightest symptoms of the disease were at once taken into hospital, and all the convalescents were placed in a detached barrack, apart from any communication, even indirectly, with the other men; and as these latter got well they were drafted to their respective companies. All the men in the regiment were ordered to wash in separate vessels, and to use their own towels only, each man having two; and the sergeants and subaltern officers were held responsible for these regulations being complied with. Even with these precautions, the disease made such progress, that it was with great difficulty we could check it, and that was not fully accomplished until we were about to leave the locality, in the spring of 1850.

"We had many formidable exciting causes to contend with, besides the extent of the existing disease. Athlone is well known as a locality where Ophthalmia constantly prevails. Nearly every regiment quartered there, for many years past, appears to have been affected with the disease. I believe the main cause of its prevalence there depends upon the great exposure of soldiers at night-time, mounting guard on those cold, bleak, unprotected positions upon the batteries and lines adjoining the bank of the River Shannon. The atmosphere is the dampest that I ever experienced, except, perhaps, in India, during the rains. The cold damp wind, coming down off the lake and the bogs at night, used to give the men Ophthalmia as if *struck* by the disease.[1] I have seen

[1] One of the men invalided from the 31st regiment told me to-day, that he went on guard perfectly well at twelve o'clock at night, and was unable to remain on his two hours, his eyes had become so much swollen and so gravelly.

four and sometimes six men come off guard into hospital, with severe conjunctivitis, who had mounted guard perfectly well. I know not if you are aware that soldiers' guard-rooms are about as small as they well can be; and that, when a sentry is relieved, he goes into the guard room, where he and his comrades lie down, in their great coats, altogether, huddled as close as possible. They shut the doors and windows, and light a large fire; and are, consequently, almost stewed. Then, when it comes again to their turn to go on sentry, they change *at once* from this great heat to a two hours' watch on the lines, exposed to the cold damp wind I have described. I am satisfied that it is this atmospheric influence, and this sudden transition, that produces Ophthalmia at Athlone, for many reasons. One will suffice. The Scotch Greys were quartered there with us, as also a battery of Artillery. These were both replaced by the 4th Light Dragoons and another battery of Artillery. Now, the men of these corps are similar to ours in every respect; they were quartered in the same barrack, and had the same rations, etc.; but they had not a single case of Ophthalmia among them; I believe because they never mounted guard as our men did. I do not believe that the disease was produced by the men themselves. Some of the best soldiers we had were attacked with it, and many of the bad ones escaped. From July 1848 to March 1850, 430 cases were admitted into hospital. Only one man went blind with both eyes. He had violent purulent Ophthalmia; and, in spite of the most active means, lost his sight in twenty-four hours. Four lost one eye each. Two of these were invalided, and two are still in the regiment; and twelve others were sent to Dublin, with chronic Ophthalmia, granular lids, opacities of cornea, etc., and were invalided in consequence. During the two years that we were quartered at Athlone, only two men upon the out-stations were attacked by the disease. They each lost an eye. I think you will allow that, out of 430 cases, for only one man to go quite blind, and four to lose one eye each, was fortunate. We were in the habit of making the men march three or four miles into the country every day, as soon as the acute symptoms had subsided, and we found no means more effectual in improving their health. We never confined them to bed, except in the inflammatory stage, and we gave them a generous diet, wine, and porter."

From this valuable communication we learn many useful facts, with respect to the exciting causes of the prevailing epidemic at Athlone, which will, I trust, be properly applied by those whom it may concern, civil and military. We likewise learn the fact, that in persons as healthy as soldiers, for whom every appliance and comfort is provided and the most judicious treatment employed, out of 432 cases, including those upon the out-stations, permanent mischief may result in seven, and twelve more be invalided; making nineteen in all, or one in every twenty-three, on the most moderate calculation.

It is no small satisfaction to me to find that the means which I recommended in Tipperary were immediately put in force, the guardians having, in a few days after my visit, procured suitable accommodation, and having had all the children labouring under Ophthalmia and its effects in the Meeting-house Lane Hospital removed to a country seat, some miles off. And in Athlone, the patients so miserably located in the Malthouse were forthwith removed to the parent Workhouse. In both localities the spread of the disease has, I understand, nearly ceased.

How far the disease has prevailed throughout the Irish Unions generally, I have no means of stating with any degree of accuracy; but I know that it has spread extensively throughout the south and west. At Limerick, in particular, I am informed by Dr. Kavanagh, it has spread extensively in the Poorhouse, and has also prevailed among the lower classes in the town, and in the neighbouring country. Upwards of 2000 cases occurred in the Workhouse and Auxiliary Workhouses of the Union since June last. It has likewise broken out in Kerry, at Tralee, and Dingle, and also at Kenmare. It has recently appeared in the Kilmallock Union, and in the Workhouse at Loughrea, as I have been informed by Dr. Lynch. Ballinasloe Union has also suffered from the epidemic. In Galway Poorhouse, Dr. Brown informs me, it broke out in June, so as to create alarm for its spread; and at the same time it appeared in the Auxiliary Workhouses of that Union, both of them situated in the country. It appeared chiefly among the boys and girls under fifteen years of age; and it was remarked that it never affected those who were labouring under dysentery. The disease was at its height in September, when 102 cases occurred. It has also prevailed slightly at Loughlinstone, near Bray.

What the exact number of persons may be, who have been totally or in part deprived of sight by this epidemic in our Irish Workhouses, I have no means of ascertaining; but I have addressed a letter to the Commissioners, enclosing a form for obtaining the desired information, which has been adopted. The returns which this circular will produce, together with the results of the Census about to be taken, will afford the true statement; and upon a subject of such importance, it is of great consequence that accurate statistical information should replace the loose assertions so frequently made, not only as regards this, but with respect to everything relating to this country.

It is quite manifest that, if the disease continues to spread, a great number of persons must, even with the greatest care and under the most judicious treatment, become blind. It cannot be expected that, in the impoverished state of this country, the friends and relations of such can receive them back into their homes; and it would scarcely be just to leave them in the hospitals and poorhouses. Some suitable asylum, where they will be properly taken care of, and educated according to their capacity, must, in process of time, be erected for their reception and maintenance. The last Poor-Law Act provides for such. At section XIV we read: "And be it enacted, that the Guardians of any Union may send any destitute poor deaf and dumb or blind child under the age of eighteen, to any Institution for the Maintenance of the Deaf and Dumb or Blind which may be approved of by the Commissioners, with the consent of the parents or guardians of such child, and may pay the expense of its maintenance there out of the Rates raised under the authority of the said first-recited Act." This, I believe, is the only country in Europe in which there is no general asylum for the destitute blind.

Dublin, December 1850.

POSTCRIPT.

"I have just received a communication from Dr. Reardon, in which he informs me that the School in Bank Place—a very much more healthy locality than the Corn-store in Meeting-house Lane—has been converted into an Ophthalmic Hospital. 'There are there', he says, in his letter of December 15, 'very good airy wards, two large yards, and a garden to walk and play in. There is also an abundant supply of fresh water, and the dwelling-house is very comfortable. We have now 250 cases in town, most in the convalescent state, and 130 in the country. We have now very few bad cases, and the disease has, with rare exceptions, lost that intensity and destructive character, which in some constitutions, paupers in particular, does not yield to any treatment. I saw such vast benefit from removing the patients to the country residence at Castle Lloyd, as you recommended, and such a marked alteration in the nature and character of this disease, and the health and appearance of the patients generally, but especially the young female children, that I am fully persuaded it alone would remove the epidemic, and that little treatment, besides strict attention to ventilation, cleanliness, warmth, and diet, would be required. Knowing this, we have lately succeeded in getting another Auxiliary Workhouse, four miles from town, to which place we have just sent 130 convalescents. The bad cases, and those requiring constant treatment, are kept at Bank Place. Many of the cases supposed to be blind four months ago are now brightening up.'"

FIRST

ANNUAL REPORT

OF

ST. MARK'S

OPHTHALMIC HOSPITAL AND DISPENSARY,

FOR

DISEASES OF THE EYE AND EAR.

DUBLIN:
PRINTED FOR THE INSTITUTION,
BY ALEX. THOM, PRINTER AND PUBLISHER, 87, ABBEY-STREET
1845.

FIRST ANNUAL REPORT.

THE Committee of St. Mark's Ophthalmic Hospital, in drawing the attention of the public to the peculiar claims of this Institution, beg leave to lay before them in this their first Annual Report, the following statement of its present prospects and condition, and the circumstances under which it was established.

Although most of the large hospitals in this city, and the several infirmaries, poor-houses, and other institutions in Ireland which afford in-door medical relief, admit patients labouring under affections of the organs of sight and hearing, there has not up to the present period existed in this country any special hospital for treating the diseases of the Eye and Ear.

The want of such an establishment, upon a scale so extensive as to afford any general relief, has long been felt by the poor, and is generally acknowledged by the upper ranks of society. That such an Institution is necessary in every well organised community, we may learn from the fact of there being now an Ophthalmic or an Aural Hospital, or both combined, in most of the large towns of England, and in almost every continental city. The advantages afforded by such an Institution can only be measured by the blessings arising from the perfection of sight and hearing.

In the year 1841, a Dispensary for treating the diseases of these organs was established in South Frederick-lane, and supported by its founder, Mr. Wilde, for twelve months; at the end of which time, finding the number of applicants, and the consequent expenditure, far exceeding what was originally contemplated, or what could be supported by individual exer-

tion, and not wishing to apply for public aid for the sum required to defray its expenses, he determined to try the experiment of making it support itself, by a monthly subscription from each of the patients. This plan succeeded fully, and since September, 1842, the patients have each paid a small monthly sum during the period of their attendance, which has defrayed the expenses of the medicine. In this way 1,056 persons were treated during the year ending September, 1843; and the total number of patients relieved with medicine, medical advice, or by operation, from the commencement of that Institution to the 1st March, 1844, was 2,075.

A large majority of patients affected with diseases of the eye, and nearly all of those labouring under the affections of the ear, only require out-door relief; yet as several of the most inveterate forms of blindness can be remedied by operation only, and as many of the patients affected with such diseases, have either come from distant parts of the country, or live in some of the most wretched and neglected parts of the city, where, from their poverty or the unhealthy condition of their dwellings, they could not possibly obtain those comforts which an hospital affords, it was proposed to establish a special hospital for the reception of such cases, or those in which daily attendance was necessary, or the dangerous nature of the disease rendered in-door treatment indispensable. And for this purpose the hospital in Mark-street has been fitted up, and the Eye and Ear Dispensary removed to it, from South Frederick-lane.

This Hospital, which is one of the oldest in the City of Dublin, and has an especial claim on our fellow citizens, was established about the year 1745, by means of a lottery fund, amounting at the present day to £845 17*s.* 3*d.*, and now placed in the 3¼ per cent. government stock, and also a Kinnegad Road Debenture, for £50, bequeathed to it by Dr. John Smith, in the year 1759, together producing the yearly income of £30 10*s.* 7*d.*, the residue of a much larger sum. It was originally situated in Cole-alley, off Meath-street, and was capable of accomodating 40 intern patients affected with surgical diseases. It was then called "St. Nicholas' Hospital, or the New Charitable Infirmary," and was the first Institution of its kind established in that populous part of the city. In 1753 it was removed to Francis-street, and in 1787 its name was changed to that of "The United Hospital of St. Nicholas' and St. Catherine."

On the erection of the present Meath Hospital and County of Dublin Infirmary, this Institution which had flourished for many years, under the superintendence of our distinguished countryman, Mr. Dease, and other celebrated physicians and surgeons of this city, was not considered further necessary in its original locality, and was therefore, in 1808, removed to St. Mark's parish, where it was re-established in connexion with an Alms House, during several years of scarcity, under the name of "The United Hospital of St. Mark and St. Anne." It is now situated in Mark-street, adjoining the Widow's House of that parish.

For a long period this Hospital had been in a decaying condition, and had got into such debt that a portion of its funds had to be disposed of, to defray its encumbrances. It was closed for several years prior to January, 1843, when its original fund, which is now under the control of the Commissioners of Charitable Bequests, was again allocated to the purposes for which it was originally intended, and the Institution was re-opened.

At the end of February, 1844, it was opened as an Ophthalmic Hospital and Dispensary for the diseases of the Eye and Ear, put into thorough repair, and supplied with so much additional furniture and other necessaries as the immediate wants of the Institution required, or its available funds could supply. Since then, a period of twelve months, 2,160 persons

have received advice and medicine at the Dispensary, which is open on the mornings of Mondays, Wednesdays, and Fridays, from nine to eleven o'clock, and 57 persons (39 males and 18 females) have been received into the wards of the Institution; each patient remaining about twenty-four days on an average. Of the out-door Dispensary patients 1,635 were original admissions, and 525 were repetitions from month to month, making a total of 2,217 patients.

The Hospital, which is located in a central situation, contains two lofty well ventilated wards, and is provided with twelve beds, six for males, and six for females, now fully furnished, besides a large waiting-room, a surgery, kitchen, and nurses' apartments, &c. The in-door patients are visited twice a day, and the attending surgeon delivers a course of Clinical Instruction in the Hospital during the winter session; thus, while relief is afforded to the poor, labouring under those maladies which are so prevalent in this country, and which, in large cities like this, so frequently terminate in the loss of one or even two of the most necessary senses—senses in so many instances furnishing the only means of livelihood to a large portion of our fellow creatures, provision is also made for instruction in two most important, yet neglected branches of medical science.

Each patient attending this Institution, with the exception of a few paupers, pays sixpence per month, for medicine and attendance at the Dispensary; and those who are admitted into Hospital, and can afford it, pay one shilling per week, which assists in defraying a portion of the expenses of the establishment.

This system of partial payments has been found to work exceedingly well. It produces care, regularity, and attention; and induces a spirit of independence amongst the lower classes of society, worthy of countenance and support; while the sum of £50 thus obtained during this, the first year of the

Institution, is in itself a sufficient guarantee to the public and its supporters, that its benefits are appreciated by the poor, numbers of whom seek its advantages from most distant parts of the country.

An accurate registry of each patient has been preserved, in which the sex, age, disease, treatment, and result, as far as such could be obtained, together with other minor details, such as date, season, duration of the affection, both previous and subsequent to admission, &c., are specified. A tabulated arrangement of such essential portions of this as could possibly be compressed within the limits of a report, like the present, is here annexed, and the Committee feel that in presenting such a document, (which will be carefully continued from year to year,) to the faculty, and to the officers of similar Institutions elsewhere, they are furnishing their mite to the valuable and now generally cultivated science of medical statistics.

The accompanying yearly account, together with a list of the donors and subscribers, to which the Committee respectfully call your attention, exhibits the present condition of the Institution, and they earnestly solicit your co-operation and support.

The Hospital is at all times open for the inspection of those who may take an interest in its welfare.

Donations and Subscriptions will be thankfully received at the Banks of Messrs. La Touche & Co., and Messrs. Boyle, Low, Pim, & Co.; by the Secretary, William Longfield, Esq., 19, Harcourt-street; by the Medical Attendant, W. R. Wilde, Esq., 15, Westland-row; or by any of the Committee.

WILLIAM LONGFIELD, *Secretary.*

8*th April*, 1845.

ST. MARK'S OPHTHALMIC HOSPITAL IN ACCOUNT,

From the 21st February, 1844, to the 1st March, 1845.

Cr. **Dr.**

	£	s.	d.		£	s.	d.
To Cash for Medicines,	35	3	10	By Cash received, Donations,	47	17	0
" Instruments,	4	0	10	" Subscriptions,	72	12	6
" Leeches,	3	0	1½	" Patients,	30	0	0
" Coals,	3	19	2	" Special Hospital Fund,	23	19	2
" Nurses' Wages,	16	2	6				
" Printing and Stationary,	13	4	9				
" Furniture and Repairs,	31	0	2½				
" Straw,	0	12	1				
" Soap and Candles,	0	18	6				
" Sundries,	1	7	11				
" Bread and Milk,	25	19	6				
" Meat,	1	7	0				
" Rent (one year's), to 1st February, 1845,	10	0	0				
" Drs. Hamilton and Brady, five week's Hospital Fund, advanced by them,	2	3	3				
	£149	19	8				
Balance in Treasurer's hands,	44	9	0				
	£194	8	8		£194	8	8

Audited 8th April, 1845,
ROBERT CALLWELL.

SUBSCRIPTIONS AND DONATIONS.

	Donations. £	s.	d.	Subscriptions. £	s.	d.
His Grace the Archbishop of Dublin,	10	0	0	–	–	–
The Countess of St. Germans,	2	0	0	–	–	–
The Right Honorable the Earl of Roden,	5	0	0	–	–	–
" the Earl of Leitrim,	–	–	–	1	0	0
Lord Mountsandford,	5	0	0	–	–	–
The Lord Mayor of Dublin,	–	–	–	1	0	0
The Honorable the Dean of St. Patrick's,	–	–	–	1	0	0
The Right Honorable the Chief Justice,	–	–	–	2	0	0
The Honorable Justice Crampton,	5	0	0	–	–	–
The Honorable Baron Pennefather,	–	–	–	1	0	0
Sir Philip Crampton, Bart.,	–	–	–	2	0	0
Sir Edward Borough, Bart.,	–	–	–	1	0	0
The Vice-Provost, T.C.D.,	–	–	–	2	0	0
The Rev. Dr. Wall, F.T.C.D.,	–	–	–	1	0	0
Mrs. Sandford,	10	0	0	1	0	0
The Rev. Dr. Lloyd, F.T.C.D.,	–	–	–	1	0	0
Rev. Charles Strong,	–	–	–	1	0	0
Edward Litton, Esq., Master in Chancery,	1	0	0	–	–	–
John Radcliff, Esq.,	–	–	–	1	0	0
Thomas Wilson, Esq.,	2	2	0	1	0	0
James Ferrier, Esq.,	–	–	–	1	1	0
Thomas Hutton, Esq.,	1	0	0	1	0	0
John Hutton and Sons,	–	–	–	5	0	0
Alexander Ferrier, Esq.,	–	–	–	1	1	0
Robert Callwell, Esq.,	–	–	–	1	0	0
B. M. Tabuteau, Esq.,	–	–	–	1	0	0
John O. Bonsall, Esq.,	–	–	–	1	0	0
Captain Bourne, R.N.,	–	–	–	2	0	0
J. R. Stewart, Esq.,	–	–	–	1	0	0
Henry Courtney, Esq.,	–	–	–	5	0	0
Daniel Nugent, Esq.,	–	–	–	1	0	0
Mrs. Vincent,	–	–	–	1	0	0
Mrs. Leek,	1	5	0	–	–	–
Mrs. Longfield,	–	–	–	1	0	0
Mrs. Digges La Touche,	1	0	0	–	–	–
Mrs. Magee,	–	–	–	1	0	0
Mrs. A. Hunt,	1	0	0	–	–	–
Miss Pike, (collected by,)	–	–	–	1	0	0
Hugh Barton, Esq.,	–	–	–	1	0	0
Robert J. Graves, Esq., M.D.,	–	–	–	1	0	0
J. W. Cusack, Esq., M.D.,	–	–	–	1	1	0
William Stokes, Esq., M.D.,	–	–	–	1	0	0
Charles Farran, Esq., M.D.,	1	0	0	–	–	–
Doctor Dawson,						
Forward,	£45	7	0	46	3	0

SUBSCRIPTIONS AND DONATIONS, CONTINUED.

	Donations. £ s. d.	Subscriptions. £ s. d.
Forward, - -	45 7 0	46 3 0
Daniel Pakenham, Esq., - - - - - -	- - -	1 0 0
John Fynn, Esq., - - - - - - -	1 0 0	1 0 0
Gilbert Burns, Esq., - - - - - -	- - -	1 0 0
Robert Gray, Esq., - - - - - - -	- - -	1 0 0
William Hyde, Esq., - - - - - -	0 10 0	1 0 0
Laurence Mooney, Esq., - - - - - -	- - -	1 0 0
Francis Codd, Esq., - - - - - - -	- - -	1 0 0
James Haughton, Esq., - - - - - -	- - -	0 10 0
Charles Webber, Esq., - - - - - -	- - -	1 0 0
Henry A. Cowper, Esq., - - - - - -	- - -	1 0 0
James M'Glashan, Esq., - - - - - -	- - -	1 0 0
T. J. Quinton, Esq., - - - - - - -	- - -	1 0 0
Messrs. Robert Smyth and Sons, - - - - -	- - -	1 0 0
John Jason Rigby, Esq., - - - - - -	- - -	0 10 0
John Cumming, Esq., - - - - - -	1 0 0	- - -
Pilots' Fund Society, Kingstown, - - - - -	- - -	1 10 0
William Hutchinson, Esq., - - - - - -	- - -	0 10 6
E. C. Smith, Esq., - - - - - - -	- - -	0 5 0
Charles Kennedy, Esq., - - - - - -	- - -	1 0 0
H. Bewley, Esq., - - - - - - -	- - -	1 0 0
William Allen and Sons, - - - - - -	- - -	1 0 0
William Tedhunter, Esq., - - - - - -	- - -	1 1 0
W. H. Pim, Esq., - - - - - - -	- - -	1 0 0
Thomas Pim, Junr., Esq., - - - - - -	- - -	1 1 0
William Reynolds, Esq., - - - - - -	- - -	1 0 0
Wrigley Grimshaw, Esq., F.R.C.S., - - - -	- - -	1 1 0
William Longfield, Esq., Secretary and Treasurer, - - - -	- - -	1 0 0
Mr. Melville, - - - - - - -	- - -	0 10 0
Mr. James Kerr, - - - - - - -	- - -	0 5 0
Mr. Waddle, - - - - - - -	- - -	0 5 0
W. R. Wilde, Esq., F.R.C.S., - - - - -	- - -	1 1 0
	£47 17 0	72 12 6
Total Donations and Subscriptions, - - -		£120 9 6

CLASSIFICATION OF DISEASES, &c.

CLASSIFICATION of Patients affected with Diseases of the EYE, relieved at ST. MARK'S HOSPITAL, during the year ending 28th February, 1845, according to their Diseases, Sexes, and Ages.

	DISEASES.	AGES.																								Totals.		Gen. Total.
		un. 1		1 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 40		40 to 50		50 to 60		60 & up							
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Diseases of the Eyelids, &c.	Inflam. of Palpebræ,	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2
	Pseuophthalmia,	.	.	.	10	10	19	12	7	3	1	2	1	1	1	3	2	1	4	.	2	.	1	46	39	85
	Tinea and Lippitudo,	.	.	.	2	3	3	4	2	0	1	2	.	.	1	2	.	2	.	1	.	2	.	19	21	40
	Trichiasis,	.	.	.	.	1	1	1	1	2	1	1	2	.	4	.	2	.	3	2	4	.	.	3	5	13	18
	Entropium,	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	1	.	1	4	1	5
	Ectropium,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Tarsal Tumours,	.	.	.	.	.	1	.	.	1	.	.	.	.	1	.	.	1	.	.	.	.	.	.	2	.	2
	Warty Do.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	1	1
	Encanthis,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Malignant Diseases of Caruncle and Cancer of Lid,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	1	.	.	.	3	1	4	5
	Epiphora,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Inflam. of Lachrymal Sac,	.	.	.	.	.	.	2	.	.	.	1	3	.	2	1	.	1	.	.	.	.	.	4	2	6	8
	Obstructed Duct,	.	.	.	.	.	.	.	.	.	.	1	0	.	2	.	1	.	1	.	.	.	.	1	3	4	5
	Fistula Lachrymalis,	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	0	2	2	2
	Injuries of Lids,	.	.	.	.	.	2	.	.	.	.	.	2	1	.	1	.	.	.	.	1	.	.	4	3	7	7
	Ankyloblepharon,	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	1	1
Injuries of the Globe.	From Fragments of Iron,	.	.	1	1	.	.	.	.	1	1	.	.	1	6	.	.	1	.	.	.	.	.	8	4	12	12
	From Lime, Acids, &c.	.	.	1	.	1	.	1	.	.	.	.	.	1	1	.	1	.	.	2	.	1	.	7	.	7	7
	Ophthalmitis,	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	1	4	5	5
Ophthalmia.	Simple Catarrhal,	.	.	4	12	3	10	9	4	3	9	3	1	3	.	3	1	.	1	1	2	.	.	23	40	63	63
	Pustular,	1	1	10	19	16	8	9	9	1	1	.	.	3	.	1	1	.	.	.	.	1	.	43	40	83	83
	Purulent, Adult, Gonorrhœal,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	2	1	3	3
	Purulent, Infantile,	7	7	3	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	11	21	21
	Strumous,	.	.	13	15	13	17	8	7	1	3	1	.	1	2	.	2	.	.	.	.	.	.	39	46	85	85
	Rheumatic,	.	.	.	.	.	.	1	.	1	1	2	2	2	2	2	2	1	.	.	.	.	.	9	7	16	16
	Chronic,	.	.	.	.	.	.	.	.	1	1	2	1	2	2	2	2	2	2	1	4	.	.	23	27	50	50
	Do. with Granular Lids,	.	.	.	.	6	2	2	1	1	1	2	1	1	2	.	1	1	3	3	.	2	2	13	16	29	29
		.	.	.	.	3	2	2	7	2	4	0	0	5	1	1	4	2	0	1	2	5	1	41	37	78	78
	Pterygium,	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	2	2
	Do. Cuticular Change, Xerosis,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diseases of Cornea.	Cornetitis, Acute,	.	.	.	.	.	.	1	.	.	4	.	2	1	1	.	.	1	.	1	.	.	1	10	6	16	16
	Cornetitis, Chronic,	.	.	.	.	.	.	.	1	.	.	.	2	.	2	.	3	2	1	.	.	.	.	3	8	11	11
	Opacities, Nebulæ, &c.	.	.	4	7	7	6	3	10	2	3	1	3	1	1	1	0	2	3	.	.	1	.	26	45	71	71
	Ulcer of Cornea,	.	.	2	4	2	2	1	3	2	1	.	1	.	.	3	2	.	.	.	.	.	.	10	13	23	23
	Leucoma,	.	.	1	1	.	1	3	1	.	2	.	.	.	.	2	1	4	.	.	.	.	.	6	10	16	16
	Vascular Cornea,	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	2	1	3	3
	Pannus,	.	.	.	.	1	.	5	1	2	2	.	.	1	2	.	1	.	.	.	.	.	.	12	8	20	20
	Staphyloma Corneæ,	.	.	5	4	.	3	1	1	.	.	.	.	.	2	3	2	.	.	.	.	.	.	5	12	21	21
	Conical Cornea,	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	2	.	2	2
Iritis.	Aquo Capsulitis,	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1
	Aquo Capsulitis with Ulcer and Hypopion,	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	3	.	3	3
	Staphyloma of Choroid,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Choroiditis,	.	.	.	.	.	2	.	.	1	3	.	2	.	.	.	.	.	.	.	.	.	.	4	.	4	4
	Rheumatic,	.	.	.	.	.	.	.	.	.	.	1	1	2	1	2	.	1	1	.	1	.	.	1	11	12	12
	Syphilitic,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Strumous,	.	.	1	4	.	.	.	.	.	.	2	1	4	.	2	.	1	1	1	.	.	.	2	1	3	3
		.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	7	2	9	9
	Prolapsus Iridis,	.	.	.	.	1	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	1	5	6	6
	Closed Pupil,	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	.	2	2
	Tremulous Iris,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1	2	2
		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2	2
Cataract.	Lenticular,	.	.	.	.	.	.	1	.	.	2	.	.	1	.	1	2	1	1	2	1	1	.	7	6	13	13
	Capsular,	.	.	2	.	.	.	.	3	.	2	.	.	2	1	3	1	1	4	4	1	6	15	15	30	30
	Traumatic,	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1
	Dislocation of Lens,	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	2	1	3	3
	Atrophy of Eye,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	2	1	3	3
	Fungus Hæmatodes,	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1
Amaurosis.	Impaired Vision, Asthenopia,	.	.	.	.	.	.	.	.	1	5	.	4	.	1	4	4	4	3	2	1	.	.	11	18	29	29
	Nyctalopia,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1
	Partial Amaurosis,	.	.	.	.	.	.	1	1	1	3	2	1	3	1	2	4	2	.	.	.	.	.	11	10	21	21
	Complete Do.,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	2	.	.	1	.	.	5	1	6	6
	Strabismus,	.	.	.	.	2	1	.	3	3	2	1	.	1	1	2	1	1	2	1	1	.	.	11	11	22	22
	Abscess of Orbit,	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	1	1
	Congenital Defect of Punctum,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1
	Total,	8	8	59	96	77	76	60	64	30	63	28	36	34	34	61	69	41	43	23	26	8	17	451	525	976	980

DISEASES OF THE EAR.

DISEASES.	AGES.																						Totals.		Gen. Total.
	un. 1		1 to 5		5 to 10		10 to 15		15 to 20		20 to 25		25 to 30		30 to 40		40 to 50		50 to 60		60 & up				
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Otitis,	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	2	.	.	.	1	.	.	.	5	.	5
Otorrhœa,	.	.	.	1	1	10	7	14	10	7	8	3	4	2	2	4	4	1	3	1	.	.	43	39	82
Do. with Polypus,	.	.	.	.	.	.	.	.	1	.	2	.	.	1	1	.	.	.	.	.	.	.	4	1	5
Deafness from Cerumen,	.	.	.	.	.	.	1	1	.	.	.	4	.	.	1	10	3	6	4	5	2	5	1	31	14	45
Abscess in Membrana Tympani,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	1	1
Chronic Inflamation of Do.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	2	3	.	.	.	.	.	2	4	6	6
Cuticular Do.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	1	1
Collapse of Do.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	1	1	2	2
Nervous Deafness,	.	.	.	.	.	.	.	.	1	.	1	.	2	3	1	7	4	3	2	3	3	1	19	13	32	32
Eczema Auriam,	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	.	.	1	.	.	.	4	4	4
Deafness from Disease of Throat,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	1	1
Total Diseases of Ear,	.	.	1	1	10	8	17	11	10	9	8	6	8	5	5	27	18	11	10	10	6	6	2	108	76	184	184
Total Diseases of Eye,	8	8	59	96	77	76	60	64	30	63	28	36	34	34	61	69	41	43	23	26	8	17	451	529	980	980
Unregistered Diseases,	.	.	.	12	29	20	15	20	15	18	19	9	10	16	16	27	26	8	7	7	4	2	4	138	136	274	274
Ages and Diseases not Specified,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	92	105	197	197
Total Patients,	8	8	72	126	107	99	97	90	78	91	44	52	58	55	115	113	69	60	40	36	16	23	789	846	1635	

DUBLIN:—PRINTED BY ALEXANDER THOM, 87, ABBEY-STREET.

SECOND

ANNUAL REPORT

OF

ST. MARK'S

OPHTHALMIC HOSPITAL AND DISPENSARY,

FOR

DISEASES OF THE EYE AND EAR.

1845.

DUBLIN:
PRINTED FOR THE INSTITUTION,
BY ALEX. THOM, PRINTER AND PUBLISHER, 87, ABBEY-STREET
1846.

5

ST. MARK'S

OPHTHALMIC HOSPITAL AND DISPENSARY,

FOR

DISEASES OF THE EYE AND EAR,

MARK-STREET.

1845.

Managing Committee:

SIR EDWARD BOROUGH, Bart.,	J. R. STEWART, Esq.,
REV. DR. WRAY, Vice-Provost,	ROBERT CALLWELL, Esq.,
REV. GEORGE Mac NEILL,	JOHN O. BONSALL, Esq.,
ALEXANDER FERRIER, Esq.,	WILLIAM LONGFIELD, Esq., Secretary and Treasurer.
THOMAS HUTTON, Esq.,	

Medical Attendants:

Surgeon, . .	W. R. WILDE, F.R.C.S.,
Consulting Physician, . . .	ROBERT J. GRAVES, M.D.,
Consulting Surgeon, . . .	SIR PHILIP CRAMPTON, Bart.,
Surgeon Dentist, . .	W. GRIMSHAW, F.R.C.S.,
Cupper, . .	Mr. MAPLESON.

ANNUAL REPORT.

The Committee of St. Mark's Ophthalmic Hospital and Dispensary, for Diseases of the Eye and Ear, in submitting their Annual Report, congratulate the supporters of this Institution upon its present flourishing condition, and its extended usefulness during the past year.

Since the publication of the last Report, 110 patients, 64 males and 46 females, have been received into the Wards of the Hospital, being nearly double the number admitted last year, each patient remaining on an average 24 days; and, independent of their medical treatment, they have been provided with every necessary, at a rate much lower than that of any similar Institution in Great Britain; and thus while the most rigid economy has been observed, every comfort has been afforded to those who have sought relief within its walls. All these were cases of urgent necessity, either from sudden accidents, or violent inflammations, &c., endangering loss of sight or hearing, or cases requiring operation for the removal of blindness. Nearly one third of these patients were admitted from remote country districts, a circumstance which the Committee beg to impress upon the Nobility and landed Gentry of Ireland, in the hope that it may induce them to aid this valuable Institution.

In the Dispensary Department, advice and medicine have been afforded to 2,407 out-door patients, of which number, 1,738 were original admissions, and 669 repetitions from month to month, making a total of 6,809 patients relieved at the Institution since its commencement, in 1841, and 167 who have derived in-door relief from the Hospital.

During the past year, the Hospital has undergone thorough repair, and two additional beds have been provided, increasing the number now occupied to 14.

From the increase in the number of applicants for relief, and the confined nature of the present Hospital, as well as its crowded locality, the Committee entertain the hope of being enabled, at no remote period, to procure a more suitable building, and thus, by increasing the accommodation, not only extend its usefulness, but add to the health and comforts of its inmates.

The Committee have the pleasure of remarking, that the system of partial payments has continued to work exceedingly well, of which the sum of £64 19*s.* 3*d.* thus raised, (being above £14 increase during the last year,) is no inconsiderable proof. Of this amount, but £5 17*s.* 6*d.* was derived from patients in Hospital, such persons being, for the most part, absolute paupers. The Committee wish it to be generally known, that while the sum of 6*d.* per month is paid by most of the patients requiring relief at the Dispensary, in order to produce care, regularity, and attention, as well as to induce a spirit of independence amongst the working classes, no one really in need of it is refused gratuitous relief.

The expense of supporting the establishment during the last year has been £187 14*s.* 5*d.*, and the income received £251 13*s.* 10*d.*, leaving a balance of £63 18*s.* 10*d.* in the Treasurer's hands, to carry on the Institution during the next year; and as the annual subscribers are necessarily fluctuating, the Committee earnestly entreat the liberality of the benevolent public in behalf of this Charitable Institution.

In furnishing a continuation of the Registry commenced in last Report, and which, for the present year, includes the age, sex, and disease of 1,796 cases, the Committee are convinced that they are not only extending the benefits of the Institution to the alleviation of disease, but also advancing medical science.

The following Account, together with the List of Contributors, shows the present condition of the Institution, which is at all times open to the inspection of those who may please to visit it.

The Hospital is visited daily, and the Dispensary is open on Mondays, Wednesdays, and Fridays, from 9 till 11 o'clock. Accidents are attended to at all times.

Donations and Subscriptions will be thankfully received at the Banks of Messrs. La Touche & Co., and Messrs. Boyle, Low, Pim, & Co.; by the Secretary, William Longfield, Esq., 19, Harcourt-street; by the Medical Attendant, W. R. Wilde, Esq., 15, Westland-row; or by any of the Committee.

WILLIAM LONGFIELD,
Secretary.

2*nd April*, 1846.

OPERATIONS PERFORMED AT ST. MARK'S OPHTHALMIC HOSPITAL, BETWEEN THE 1st MARCH, 1845, AND 1st MARCH, 1846.

		Male.	Female	Total.
Cataract — Absorption — Keratonyxis		21	15	36
Cataract — Absorption — Scleroticonyxis		3	–	3
Cataract — Extraction		6	2	8
Artificial Pupil		7	2	9
Staphyloma		4	8	12
Extirpation of Globe		–	1	1
Pterygium		1	2	3
Strabismus, right Eye		9	5	14
„ left Eye		1	5	6
„ both Eyes		–	2	2
Entropium and Trichiasis		8	26	34
Ectropium		1	3	4
Tarsal Tumors		6	7	13
Epicanthus		1	–	1
Symblepharon		1	–	1
On Lachrymal Sac		1	–	1
Blepharo-plastic		–	3	3
Stomato-plastic		1	–	1
Rhino-plastic		1	–	1
Aneurism of Palpebræ		–	4	4
Polypus Auri		20	2	22
		90	87	177

Dr. THE TREASURER IN ACCOUNT WITH ST. MARK'S OPHTHALMIC HOSPITAL, **Cr.**

From 1st March, 1845, to 1st March, 1846.

	£	s.	d.		£	s.	d.
To Balance in hands on 1st March, 1845,	44	9	0	By Cash for Medicine,	36	17	8
„ Cash received, special Hospital Fund,	29	19	6	„ Instruments,	4	9	9
„ Subscriptions,	66	5	6	„ Leeches,	19	1	7
„ City Grand Jury Grant, Easter Term, 1845,	46	0	0	„ Coals,	6	17	6
„ Dispensary and Hospital Patients,	64	19	3	„ Salaries and Nurse's Wages,	27	16	6
				„ Printing and Stationery,	6	8	4
				„ Furniture and Repairs,	17	18	9
				„ Straw,	1	4	9
				„ Soap and Candles,	2	1	9
				„ Sundries,	3	1	8
				„ Bread, Meat, and Milk,	56	16	2
				„ Rent,	5	0	0
				Total Expenditure,	£187	14	5
				Balance in hands,	63	18	10
Total,	£251	13	3	Total,	£251	13	3

I have examined this Account, and compared the Vouchers, and find that £63 18*s.* 10*d.* is the balance in Treasurer's hands.

2*nd April*, 1846. ROBERT CALLWELL.

CONTRIBUTIONS

FOR THE YEAR ENDING 1st MARCH, 1846.

	£	s.	d.
His Grace the Duke of Leinster,	5	0	0
The Right Honorable the Earl of Leitrim,	5	0	0
The Lord Mountmaresford,	10	0	0
The Lady Fitzgerald,	5	0	0
The Hon. and Very Rev. the Dean of St. Patrick's,	1	0	0
The Very Rev. the Dean of Leighlin,	1	0	0
Sir Edward Denny, Bart.,	1	0	0
Sir Philip Crampton, Bart.,	10	0	0
Sir Edward Borough, Bart.,	1	1	0
Alexander Ferrier, Esq.,	1	1	0
Medicus,	1	0	0
J. M. O'Ferrall, M.D.,	1	0	0
Miss M. Kennedy,	1	0	0
Hugh Barton, Esq., Straffan,	1	0	0
William Edington, Esq.,	1	0	0
George Smith, Esq.,	1	0	0
The Rev. Dr. Wall, F.T.C.D.,	1	0	0
Henry Fakenham, Esq.,	0	10	0
Henry Sampey, Esq., Canberra,	1	0	0
Dr. Kenny,	1	0	0
Mrs. Robbins,	1	0	0
William Longfield, Esq.,	1	0	0
Mrs. Neville,	1	0	0
Miss Holt, Ballyclare,	1	0	0
Mr. Merton, Borris,	1	0	0
Gilbert Burns, Esq.,	1	0	0
J. O. Bonnell, Esq.,	1	0	0
Robert Smyth & Sons,	1	0	0
Miss Aldridge,	0	7	6
John A. Green, Esq.,	1	0	0
Robert Alexander, Esq., Loughbrickland,	2	0	0
James Downman, Esq., Cork,	1	0	0
Daniel Fakenham, Esq.,	1	0	0
The Rev. Charles Strong,	1	0	0
John Litton, Esq.,	1	0	0
Mrs. Edgeworth, Edgeworthstown,	1	0	0
W. H. Cowper, Esq.,	1	0	0
Carried forward,	£48	1	6

CONTRIBUTIONS, CONTINUED.

	£	s.	d.
Brought forward, . .	48	1	6
Henry Bewley, Esq., ...	1	0	0
John Hutton & Sons, ...	5	0	0
John Radcliffe, Esq., ...	1	0	0
J. P. Bell, Esq., Fermoy, ...	1	1	0
W. R. Wilde, F.R.C.S., ...	1	0	0
Lawrence Mooney, Esq., ...	1	0	0
W. Bond, Esq., The Argory, Armagh, ...	1	0	0
W. Stokes, M.D., ...	1	1	0
J. W. Cusack, M.D., ...	1	0	0
J. R. Stewart, Esq., ...	1	0	0
Daniel Nugent, Esq., ...	1	0	0
Robert Callwell, Esq., ...	1	1	0
W. Allen & Sons, ...	1	0	0
James Ferrier, Esq., ...	1	1	0
	£66	5	6

RECEIVED SINCE AUDITING THE ACCOUNT.

Thomas Wilson, Esq., ...	1	0	0
T. J. Quinton, Esq., ...	1	0	0
H. Courtney, Esq., ...	1	0	0
George Smith, Esq., ...	1	0	0
B. M. Tabuteau, Esq., ...	1	0	0
C. Webber, Esq., ...	0	10	0
Mrs. Vincent, ...	1	0	0
The Right Hon. Chief Justice Pennefather, . . .	1	0	0
Alexander Thom, Esq., ...	1	0	0
Miss Pike, (Collected by)	0	15	0
George Roe, Esq., ...	1	0	0
The Hon. Baron Pennefather, ...	1	0	0
Rev. Dr. Wray, Vice-Provost, ...	2	0	0
Francis Codd, Esq., ...	1	0	0
Captain Stretch, ...	1	0	0
Rev. H. Lloyd, P.R.I.A., ...	1	0	0

CONTRIBUTORS TO ST. MARK'S OPHTHALMIC HOSPITAL SINCE ITS COMMENCEMENT.

	£	s.	d.
His Grace the Archbishop of Dublin, - - -	10	0	0
His Grace the Duke of Leinster,	2	0	0
The Countess of St. Germains,	2	0	0
The Rt. Hon. the Earl of Roden,	5	0	0
The Rt. Hon. the Earl of Leitrim,	6	0	0
The Lord Mountsandford, -	7	0	0
The Lady Fitzgerald, -	5	0	0
The Hon. and Very Rev. the Dean of St. Patrick's, - -	2	0	0
The Rt. Hon. the Chief Justice,	3	0	0
The Hon. Baron Pennefather,	2	0	0
The Hon. Justice Crampton,	5	0	0
The Very Rev. the Dean of Leighlin,	1	0	0
Sir Edward Denny, Bart., -	1	1	0
Sir Philip Crampton, Bart., -	4	0	0
Sir Edward Borough, Bart., -	2	1	0
The Vice-Provost, T.C.D., -	4	0	0
Mrs. Sandford, - - -	11	0	0
Robert Alexander, Esq., -	2	0	0
Miss Aldridge, - - -	0	7	6
William Allen and Sons, -	2	1	0
Hugh Barton, Esq., Straffan,	2	0	0
Miss Bell, Ballyclare, - -	1	0	0
J. P. Bell, Esq., Fermoy, -	1	1	0
Henry Bewley, Esq., - -	2	0	0
William Bond, Esq., The Argory,	1	0	0
John O. Bonsall, Esq., -	2	0	0
Captain Bourne, R.N., -	2	0	0
Gilbert Burns, Esq., - -	2	0	0
Robert Callwell, Esq., - -	2	0	0
Francis Codd, Esq., - -	2	0	0
Henry Courtney, Esq., -	6	0	0
Henry A. Cowper, Esq., -	2	0	0
John Cumming, Esq., - -	1	0	0
J. W. Cusack, M.D., - -	2	0	0
W. Dawson, M.D., Dungannon,	1	0	0
James Dowman, Esq., Cork,	1	0	0
Mrs. Edgeworth, Edgeworthstown,	1	0	0
William Edington, Esq., -	1	0	0
Alexander Ferrier, Esq., -	2	2	0
James Ferrier, Esq., - -	2	2	0
John Fynn, Esq., Ballynagibbon,	2	0	0
R. J. Graves, M.D., - -	1	0	0
Robert Gray, Esq., -	1	0	0
Wrigley Grimshaw, F.R.C.S.,	1	1	0
John A. Green, Esq., - -	1	0	0
James Haughton, Esq., -	0	10	0
Mrs. A. Hunt, - - -	1	0	0
William Hutchinson, Esq., -	0	10	6
William Hyde, Esq., - -	1	10	0

	£	s.	d.
Thomas Hutton, Esq., - -	2	0	0
John Hutton and Sons, -	10	0	0
Miss M. Kennedy, - -	1	0	0
Charles Kennedy, Esq., -	1	0	0
Dr. Kenny, - - -	1	0	0
Mr. James Kerr, - -	0	5	0
Mrs Digges La Touche, -	1	0	0
Mrs. Leek, - - -	1	0	0
E. Litton, Esq., Master in Chan.,	1	0	0
John Litton, Esq., - -	1	0	0
The Rev. Dr. Lloyd, F.T.C.D.,	1	0	0
Mrs. Longfield, - - -	1	0	0
William Longfield, Esq., -	2	0	0
James M'Glashan, Esq., -	1	0	0
Mrs. Magee, - - -	1	0	0
Medicus, - - -	1	0	0
Mr. Melville, - - -	0	10	0
Lawrence Mooney, Esq., -	2	0	0
— Morten, Esq., Borris, -	1	0	0
Mrs. Neville, - - -	1	0	0
Daniel Nugent, Esq., - -	2	0	0
J. M. O'Ferrall, M.D., -	1	0	0
Daniel Pakenham, Esq., -	2	0	0
Henry Pakenham, Esq., -	1	0	0
Miss Pike, (Collected by) -	1	15	0
Pilots' Fund Society, Kingstown,	1	10	0
Thomas Pim, Esq., - -	1	1	0
W. H. Pim, Esq., - -	1	0	0
T. J. Quinton, Esq., - -	2	0	0
John Radcliffe, Esq., -	2	0	0
William Reynolds, Esq., -	1	0	0
John Jasen Rigby, Esq., -	0	10	0
George Roe, Esq., - -	1	0	0
Mrs. Robbins, - - -	1	0	0
Henry Sampey, Esq., - -	0	10	0
E. C. Smith, Esq., - -	0	5	0
George Smith, Esq., - -	2	0	0
Robert Smyth and Sons, -	2	0	0
J. R. Stewart, Esq., - -	2	0	0
W. Stokes, M.D., - -	2	2	0
Rev. Charles Strong, - -	2	0	0
Captain Stretch, - - -	1	0	0
B. M. Tabuteau, Esq., -	2	0	0
Alexander Thom, Esq., -	1	0	0
William Todhunter, Esq., -	1	1	0
Mrs. Vincent, - - -	2	0	0
Mr. Waddle, - - -	0	5	0
The Rev. Dr. Wall, F.T.C.D.,	2	0	0
Charles Webber, Esq., -	1	10	0
Thomas Wilson, Esq., -	4	2	0
W. R. Wilde, F.R.C.S.I., -	4	1	0

CLASSIFICATION according to their Diseases, Sexes, and Ages, of Patients affected with Diseases of the EYE, registered at ST. MARK'S HOSPITAL, during the Year ending 28th February, 1846.

	DISEASES.	AGES.																						Totals.		Gen. Total.
		un. 1		1 to 5		5 to 10		11 to 15		15 to 20		21 to 30		30 to 40		41 to 50		51 to 60		60 and up						
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Diseases of the Eyelids, &c.	Inflam. of Palpebræ,	.	.	.	2	1	.	.	.	2	.	1	.	.	1	.	.	.	.	.	.	.	.	4	3	7
	Psorophthalmia,	.	.	25	17	13	15	5	6	7	3	5	3	2	3	3	2	3	1	2	.	.	.	61	50	111
	Tinea and Lippitudo,	.	.	1	2	.	.	2	1	2	.	.	.	1	1	1	1	2	1	.	.	2	.	7	10	17
	Trichiasis,	.	.	.	.	1	1	.	3	.	3	1	3	.	4	1	7	.	5	.	2	1	.	4	26	30
	Entropium,	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	2	1	3
	Ectropium,	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	1	.	2	.	2
	Sebaceous Tumors,	.	.	1	1	1	.	.	.	1	4	1	1	2	1	1	1	.	.	.	.	.	.	7	8	15
	Malignant Diseases of Caruncle & Cancer of Lid,	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Epiphora,	.	.	.	.	.	.	.	.	2	.	2	1	1	.	.	.	.	.	.	.	.	.	5	1	6
	Inflam. of Lachrymal Sac,	.	.	.	.	.	.	.	.	2	2	1	.	.	.	.	.	.	.	.	.	.	.	3	3	6
	Obstructed Lach. Duct,	.	.	1	.	.	.	.	.	.	.	.	.	.	2	.	1	.	.	1	.	.	.	1	3	4
	Fistula Lachrymalis,	.	.	.	.	1	.	2	1	1	.	2	1	.	1	.	.	.	.	.	.	.	.	4	2	6
	Injuries of the Lids,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	1
	Ankyloblepharon,	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	1
	Aneurisma Palpebrarum,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Injuries of the Eye.	From Fragments of Iron, &c.	.	.	2	2	4	.	.	1	1	3	.	1	.	4	2	2	.	1	.	1	.	.	18	8	26
	From Lime, Acids, &c.,	.	.	2	2	7	1	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	10	1	11
	Ophthalmitis,	.	.	2	3	1	.	4	1	1	.	1	2	.	3	3	.	2	.	1	.	.	.	7	15	22
Ophthalmia.	Simple Catarrhal,	1	3	15	13	10	9	2	2	5	1	4	2	4	1	.	2	.	2	.	.	.	1	45	39	84
	Pustular,	1	1	31	35	37	26	13	5	7	6	3	5	2	3	2	4	1	.	1	1	.	.	96	88	184
	Irritable,	2	.	23	15	.	1	7	1	12	.	.	.	.	1	.	.	.	2	1	.	.	.	45	19	64
	Purulent, Adult, (Gonorrhœal,)	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	1	1	2
	Purulent, Infantile,	7	5	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	5	13
	Strumous,	.	1	14	28	13	13	9	9	1	3	2	.	2	.	.	.	.	.	.	.	.	.	39	67	106
	Rheumatic, (Sclerotitis,)	.	.	1	.	.	1	1	3	2	5	1	5	5	12	4	11	5	11	4	2	2	.	55	26	81
	Chronic,	.	.	2	2	.	.	2	1	1	1	5	.	4	4	5	11	9	8	6	1	1	1	55	36	91
	Do. with Granular Lids,	.	.	.	.	.	.	.	3	3	4	4	1	3	5	6	4	5	1	4	1	1	.	37	29	66
	Pterygium,	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	3	1	4
Diseases of Cornea.	Xerosis,	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Strumous degeneration,	.	.	.	.	.	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	3
	Cornesis, Acute,	.	.	.	.	.	.	1	1	1	2	1	2	.	2	2	3	2	1	.	.	.	.	7	11	18
	Cornesis, Chronic,	.	.	.	4	.	.	.	1	2	1	2	2	3	4	1	.	1	.	1	1	.	.	9	13	22
	Opacities, Nebulæ, &c.,	1	1	9	16	.	10	3	9	3	9	.	4	3	3	2	.	1	2	2	1	.	.	18	62	80
	Leucoma,	.	.	.	1	2	.	1	.	1	2	3	1	1	1	.	3	2	.	1	1	.	.	9	11	20
	Vascular Cornea,	.	.	.	1	1	1	.	2	2	1	1	.	.	.	.	.	.	.	.	.	.	.	5	4	9
	Pannus,	.	.	.	.	.	1	.	8	2	4	3	4	4	3	1	4	.	1	.	.	1	1	27	11	38
	Staphyloma Corneæ,	.	.	3	3	2	4	1	.	.	.	1	1	.	.	.	.	2	.	.	.	.	.	7	8	15
	Conical Cornea,	.	.	.	.	.	.	1	2	.	.	2	.	.	.	.	.	.	.	.	.	.	.	4	2	6
	Ulcer Cornea,	.	.	5	9	8	12	1	4	2	2	.	1	.	2	1	.	.	.	.	.	1	1	23	26	49
	Aqua-Capsulitis and Iritis,	.	.	.	.	1	.	1	.	.	.	.	7	1	.	.	.	2	.	.	.	.	.	8	1	9
	Aqua-Capsulitis with Hypopion and Ulcer,	.	.	4	.	1	1	.	.	1	.	1	.	1	.	1	1	1	1	.	.	.	.	9	4	13
Iritis.	Staphyloma of Choroid,	.	1	.	2	.	1	.	.	1	2	.	.	.	2	.	.	.	.	.	.	.	.	3	6	9
	Choroiditis,	.	.	1	.	.	.	.	.	1	.	1	1	2	.	.	.	.	.	.	.	.	.	3	2	5
	Rheumatic,	.	.	.	.	.	.	.	.	1	1	1	3	3	2	2	2	1	3	.	.	.	.	10	11	21
	Syphilitic,	.	.	.	.	.	.	.	.	2	.	2	2	2	1	.	.	.	.	.	.	.	.	7	5	12
	Strumous,	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2
	Prolapsus Iridis,	.	.	.	.	.	.	1	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	4	4	8
	Closed Pupil,	.	.	.	.	2	.	.	.	.	.	.	.	.	.	1	.	.	.	1	1	1	.	4	1	5
	Mydriasis and Tremulous Iris,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cataract.	Lenticular,	.	.	.	.	.	.	1	1	1	.	3	1	1	2	2	2	6	5	4	5	6	4	37	31	68
	Capsular,	.	.	.	.	.	.	1	.	2	1	.	1	.	1	.	1	1	4	1	3	2	.	7	16	23
	Traumatic,	.	.	.	1	.	1	.	1	.	1	.	1	.	1	.	1	.	1	.	.	.	.	1	6	7
Amaurosis.	Dislocation of Lens,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	1
	Atrophy of Eye,	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	1
	Pathi-is Oculi,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Hydrophthalmia,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Synechia Anterior,	.	.	.	.	.	.	1	.	1	.	1	.	.	.	1	1	.	.	1	.	.	.	3	3	6
	Fungus Hæmatodes,	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3
	Impaired Vision, (Asthenopia,)	.	.	.	.	.	.	2	3	10	5	7	5	4	6	8	5	7	5	1	.	.	.	39	29	68
	Nyctalopia,	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	1
	Partial Amaurosis,	.	.	.	.	.	.	1	.	3	2	5	1	3	4	13	7	6	3	4	1	.	.	33	18	51
	Complete Do.,	.	.	.	.	.	.	.	.	1	.	2	2	2	.	3	.	5	.	2	1	2	.	13	6	19
	Strabismus,	.	.	3	2	.	.	5	3	.	2	3	1	1	.	.	1	.	.	.	.	.	.	13	11	24
	Ptosis,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Abscess of Orbit,	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
Congenital defect of Eye.	Iris,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Globe,	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2
	Lids,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	TOTAL,	12	16	158	161	106	121	72	79	74	83	67	89	72	66	98	74	59	67	31	26	16	11	764	793	1557

CLASSIFICATION according to their Diseases, Sexes, and Ages, of Patients affected with Diseases of the EYE, relieved at ST. MARK'S HOSPITAL, during the year ending 28th February, 1845.

	DISEASES.	AGES.																						Totals.		Gen. Total.
		un. 1		1 to 5		5 to 10		11 to 15		15 to 20		21 to 30		30 to 40		41 to 50		51 to 60		60 & up						
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Diseases of the Eyelids, &c.	Inflam. of Palpebræ,	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	2	.	2
	Psorophthalmia,	.	.	.	.	10	10	19	12	7	5	3	1	2	1	1	1	3	2	1	4	2	1	46	29	87
	Tinea and Lippitudo,	.	.	.	.	2	3	2	4	2	5	1	3	.	.	1	2	.	2	.	1	2	.	10	22	32
	Trichiasis,	.	.	.	.	.	1	1	1	1	2	1	3	.	4	.	2	.	3	2	4	.	3	5	23	28
	Entropium,	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	1	.	.	4	.	4
	Ectropium,	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	3	.	3
	Tarsal Tumors, (Sebaceous,)	.	.	.	.	1	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	2	1	3	
	Do., (Warty,)	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	
	Facanthis,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	1
	Malignant Diseases of Caruncle and Cancer of Lid,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	.	.	.	.	3	1	4
	Epiphora,	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	2	1	.	.	.	.	4	2	6
	Inflam. of Lachrymal Sac,	.	.	.	.	.	.	2	.	.	.	1	3	.	2	.	1	.	1	.	.	.	.	1	8	9
	Obstructed Lach. Duct,	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	1	2	3
	Fistula Lachrymalis,	.	.	.	.	.	.	2	.	.	.	2	1	.	1	.	.	.	1	.	.	.	.	4	1	5
	Injuries of Lids,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Ankyloblepharon,	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	1
Injuries of the Eye.	From Fragments of Iron,	.	.	1	1	.	.	.	.	1	1	.	.	1	6	.	.	.	.	.	1	.	.	8	4	12
	From Lime, Acids, &c.,	.	.	1	.	1	1	1	.	.	.	1	.	.	.	.	.	.	2	.	.	.	.	7	1	8
	Ophthalmitis,	.	.	.	.	.	.	.	.	1	.	.	.	1	.	2	.	1	1	.	.	.	.	1	4	5
Ophthalmia.	Simple Catarrhal,	.	.	4	12	3	10	1	4	5	9	3	1	3	.	3	1	.	1	1	2	.	.	23	46	69
	Pustular,	1	1	10	19	18	8	9	9	1	1	.	.	5	.	1	1	.	.	.	.	1	.	48	40	88
	Purulent, Adult, (Gonorrhœal,)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	3	.	3
	Purulent, Infantile,	7	7	3	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	11	21
	Strumous,	.	.	18	15	13	17	8	7	1	3	1	1	2	.	2	.	.	.	.	.	1	.	38	46	84
	Rheumatic,	.	.	.	.	.	.	1	.	.	1	1	2	3	2	2	8	5	9	7	1	4	.	23	27	50
	Chronic,	.	.	.	4	2	2	1	1	1	2	1	1	2	1	1	1	3	3	2	2	2	1	13	16	29
	Do. with Granular Lids,	.	.	.	2	2	2	2	7	2	14	9	5	5	1	1	4	5	3	1	2	5	1	41	37	78
	Pterygium,	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	1
	Cuticular Change, (Xerosis,)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
Diseases of Cornea.	Cornesis, Acute,	.	.	.	.	.	.	1	.	1	4	.	2	1	1	.	.	1	2	.	1	.	1	10	4	14
	Cornesis, Chronic,	.	.	.	.	.	.	.	1	1	.	.	.	2	.	2	.	.	2	.	.	.	.	5	6	11
	Opacities, Nebulæ, &c.,	.	.	.	4	7	7	6	5	10	3	5	1	3	1	1	1	5	3	3	.	1	.	26	43	71
	Ulcer of Cornea,	.	.	.	2	4	2	2	1	2	2	1	.	1	.	.	3	2	.	.	.	.	.	10	13	23
	Leucoma,	.	.	.	1	1	.	1	2	1	.	.	.	.	.	.	2	.	2	.	.	.	.	4	10	14
	Vascular Cornea,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	2	1	3
	Pannus,	.	.	.	.	.	1	.	5	1	2	2	.	.	1	.	2	.	1	.	.	.	.	12	3	15
	Staphyloma Corneæ,	.	.	.	5	4	.	3	1	1	.	.	.	2	3	2	.	.	.	.	.	.	.	9	12	21
	Conical Cornea,	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	2	.	2
	Aqua-Capsulitis,	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1
	Aqua-Capsulitis with Ulcer and Hypopion,	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	3	.	3
Iritis.	Staphyloma of Choroid,	.	.	.	.	3	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	5	1	6
	Choroiditis,	.	.	.	.	.	.	.	1	.	3	.	1	3	1	2	.	1	.	.	.	.	.	1	11	12
	Rheumatic,	.	.	.	.	.	.	.	.	.	.	2	1	4	.	2	.	.	1	1	.	1	.	2	1	3
	Syphilitic,	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	4	.	2	.	1	1	.	1	7	8
	Strumous,	.	.	.	.	1	4	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	5	6
	Prolapsus Iridis,	.	.	.	.	.	.	1	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	2	2	4
	Closed Pupil,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	2	1	3
	Tremulous Iris,	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	1	1	2
Cataract.	Lenticular,	.	.	.	.	.	.	1	.	.	2	.	.	2	1	1	1	2	1	1	2	1	1	7	6	13
	Capsular,	.	.	.	2	.	.	.	2	.	.	2	1	1	3	1	1	4	4	1	6	15	15	30	
	Traumatic,	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
Amaurosis.	Dislocation of Lens,	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	1	.	.	.	.	2	1	3
	Atrophy of Eye,	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	.	2
	Fungus Hæmatodes,	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	1	2
	Impaired Vision, (Asthenopia,)	.	.	.	.	.	.	.	.	1	5	.	4	.	1	6	4	3	2	1	.	.	.	11	18	29
	Nyctalopia,	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Partial Amaurosis,	.	.	.	.	.	.	1	1	1	3	2	1	3	1	2	4	2	.	.	.	.	.	11	10	21
	Complete Do.,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	2	.	.	1	.	.	5	1	6
	Strabismus,	.	.	.	.	2	1	3	3	2	1	.	1	1	2	1	1	2	1	1	.	.	.	11	17	28
	Abscess of Orbit,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1
Congenital defect of Eye.	Congenital Defect of Punctum	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	TOTAL,	8	8	59	96	77	76	60	64	50	63	28	36	34	34	61	69	41	43	23	36	8	17	451	529	980

DISEASES OF THE EAR—1846.

DISEASES.	AGES. un. 1. M.	F.	1 to 5 M.	F.	6 to 10 M.	F.	11 to 15 M.	F.	16 to 20 M.	F.	21 to 25 M.	F.	26 to 30 M.	F.	31 to 40 M.	F.	41 to 50 M.	F.	51 to 60 M.	F.	61 & up M.	F.	Total M.	F.	Gen. Total.
Otitis, - - - - -	.	.	2	1	3	1	3	1	.	.	3	.	.	1	1	4	.	1	.	.	.	.	12	9	21
Otorrhœa, - - - - -	.	.	8	5	2	2	8	7	4	10	3	4	1	3	2	.	.	1	.	.	.	.	29	27	56
Do. with Polypus, - - -	3	.	.	.	2	1	1	2	1	1	1	.	.	.	1	.	.	.	.	.	.	.	6	5	11
Deafness from Cerumen, -	.	.	.	1	3	1	2	1	2	2	.	.	2	3	6	9	10	8	11	3	5	2	41	32	73
Abscess in Membrana Tympani,	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
Chronic Inflammation of Do. -	.	.	.	.	1	2	3	1	4	2	1	2	4	3	7	4	3	3	1	.	1	.	25	17	42
Cuticular Do. - - -	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	2	1	.	.	.	.	2	2	[illegible]
Collapse of Do. - - -	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	1	1	[illegible]
Nervous Deafness, - -	.	.	.	.	.	.	.	.	.	2	.	1	2	.	4	3	4	1	.	.	.	.	11	7	[illegible]
Eczema Aurium, - - -	.	.	2	1	1	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	3	3	[illegible]
Deafness from disease of Throat	.	.	.	.	1	1	1	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	3	3	[illegible]
Deafness, Congenital, one ear,	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	[illegible]
Chronic Inflam. of External	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	[illegible]
Meatus, - - - -	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	2	.	1	.	.	.	.	1	4	[illegible]
Tinnitus Aurium, - - -	.	.	.	.	.	.	.	.	.	2	.	1	.	1	1	.	1	2	.	1	.	.	2	7	[illegible]
Myringitis, - - - -	.	.	.	.	.	.	.	.	.	1	1	.	1	.	.	.	.	.	.	.	.	.	2	1	[illegible]
Total Diseases of Ear, -	.	.	12	8	15	14	19	14	13	22	9	8	14	14	23	22	20	19	12	4	6	2	143	127	270
Total Diseases of Eye, -	12	16	158	161	106	121	72	79	74	83	65	65	72	66	98	74	59	67	31	26	16	11	763	763	1526
Total Diseases, - -	12	16	170	169	121	135	91	93	87	105	74	77	86	80	121	96	79	86	43	30	22	13	906	890	1796

DISEASES OF THE EAR—1845.

DISEASES.	AGES. un. 1. M.	F.	1 to 5 M.	F.	6 to 10 M.	F.	11 to 15 M.	F.	16 to 20 M.	F.	21 to 25 M.	F.	26 to 30 M.	F.	31 to 40 F.	M.	41 to 50 F.	F.	51 to 60 M.	F.	61 & up M.	F.	Total. M.	F.	Gen. Total.
Otitis, - - - - -	.	.	.	.	.	.	.	.	.	.	1	.	1	.	2	.	.	.	1	.	.	.	5	.	5
Otorrhœa, - - - -	.	.	1	1	10	7	14	10	7	8	3	4	2	2	4	4	1	3	1	.	.	.	43	39	82
Do. with Polypus, - - -	.	.	.	.	.	.	1	.	2	.	.	.	1	1	.	.	.	.	.	.	.	.	4	1	5
Deafness from Cerumen, -	.	.	.	.	.	1	1	.	.	.	4	.	.	1	10	8	6	4	5	2	5	1	31	14	45
Abscess in Membrana Tympani,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	1
Chronic Inflammation of Do. -	.	.	.	.	.	.	.	.	.	1	.	.	.	.	2	3	.	.	.	.	.	.	2	4	6
Cuticular Do. - - -	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	1
Collapse of Do. - - -	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	1	1	2
Nervous Deafness, - - -	.	.	.	.	.	.	1	.	1	.	.	2	3	1	7	4	3	2	3	3	1	1	19	12	31
Eczema Aurium, - - -	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	2	.	.	.	1	.	.	.	4	4
Deafness from disease of Throat	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	1
Total Diseases of Ear, -	.	.	1	1	10	8	17	11	10	9	8	6	8	5	37	18	11	10	10	6	6	2	108	76	184
Total Diseases of Eye, -	8	8	50	96	77	76	60	64	50	63	[illegible]	36	34	34	61	69	41	43	23	26	8	17	431	529	960
Unregistered Diseases, - -	.	.	12	20	20	15	20	15	18	19	8	10	16	16	27	26	8	7	7	4	2	4	128	146	274
Ages and Diseases not specified,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	92	105	197
Total Patients, - - -	8	8	72	126	107	99	97	90	78	91	44	52	58	55	153	118	60	60	40	36	16	23	780	865	1635

EXTRACT FROM THE FIRST ANNUAL REPORT.

Although most of the large Hospitals in this city, and the several infirmaries, poor-houses, and other institutions in Ireland which afford in-door medical relief, admit patients labouring under affections of the organs of sight and hearing, there has not up to the present period existed in this country any special Hospital for treating the diseases of the Eye and Ear.

The want of such an establishment, upon a scale so extensive as to afford any general relief, has long been felt by the poor, and is generally acknowledged by the upper ranks of society. That such an Institution is necessary in every well organised community, we may learn from the fact of there being now an Ophthalmic or an Aural Hospital, or both combined, in most of the large towns of England, and in almost every continental city. The advantages afforded by such an Institution can only be measured by the blessings arising from the perfection of sight and hearing.

In the year 1841, a Dispensary for treating the diseases of these organs was established in South Frederick-lane, and supported by its founder, Mr. Wilde, for twelve months; at the end of which time, finding the number of applicants, and the consequent expenditure, far exceeding what was originally contemplated, or what could be supported by individual exertion, and not wishing to apply for public aid for the sum required to defray its expenses, he determined to try the experiment of making it support itself, by a monthly subscription from each of the patients. This plan succeeded fully, and since September, 1842, the patients have each paid a small monthly sum during the period of their attendance, which has defrayed the expenses of the medicine. In this way 1,056 persons were treated during the year ending September, 1843; and the total number of patients relieved with medicine, medical advice, or by operation, from the commencement of that Institution to the 1st March, 1844, was 2,075.

A large majority of patients affected with diseases of the eye, and nearly all of those labouring under the affections of the ear, only require out-door relief; yet as several of the most inveterate forms of blindness can be remedied by operation only, and as many of the patients affected with such diseases, have either come from distant parts of the country, or live in some of the most wretched and neglected parts of the city, where, from their poverty or the unhealthy condition of their dwellings, they could not possibly obtain those comforts which an Hospital affords, it was proposed to establish a special Hospital for the reception of such cases, or those in which daily attendance was necessary, or the dangerous nature of the disease rendered in-door treatment indispensable. And for this purpose the hospital in Mark-street has been fitted up, and the Eye and Ear Dispensary removed to it, from South Frederick-lane.

This Hospital, which is one of the oldest in the City of Dublin, and has an especial claim on our fellow citizens, was established about

the year 1745, by means of a lottery fund, amounting at the present day to £845 17*s.* 3*d.*, and now placed in the 3½ per cent. government stock, and also a Kinnegad Road Debenture, for £50, bequeathed to it by Dr. John Smith, in the year 1759, together producing the yearly income of £30 10*s.* 7*d.*, the residue of a much larger sum. It was originally situated in Cole-alley, off Meath-street, and was capable of accommodating 40 intern patients affected with surgical diseases. It was then called "St. Nicholas' Hospital, or the New Charitable Infirmary," and was the first Institution of its kind established in that populous part of the city. In 1753 it was removed to Francis-street, and in 1787 its name was changed to that of "The United Hospital of St. Nicholas and St. Catherine."

On the erection of the present Meath Hospital and County of Dublin Infirmary, this Institution which had flourished for many years, under the superintendance of our distinguished countryman, Mr. Dease, and other celebrated physicians and surgeons of this city, was not considered further necessary in its original locality, and was therefore, in 1808, removed to St. Mark's parish, where it was re-established in connexion with an Alms' House, during several years of scarcity, under the name of "The United Hospital of St. Mark and St. Anne." It is now situated in Mark-street, adjoining the Widows' House of that parish.

For a long period this Hospital had been in a decaying condition, and had got into such debt, that a portion of its funds had to be disposed of, to defray its incumbrances. It was closed for several years prior to January, 1843, when its original fund, which is now under the control of the Commissioners of Charitable Bequests, was again allocated to the purposes for which it was originally intended, and the Institution was re-opened.

At the end of February, 1844, it was opened as an Ophthalmic Hospital and Dispensary for the diseases of the Eye and Ear, put into thorough repair, and supplied with so much additional furniture and other necessaries as the immediate wants of the Institution required, or its available funds could supply. Since then, a period of twelve months, 2,160 persons have received advice and medicine at the Dispensary, which is open on the mornings of Mondays, Wednesdays, and Fridays, from nine to eleven o'clock, and 57 persons (39 males and 18 females) have been received into the wards of the Institution; each patient remaining about twenty-four days on an average. Of the out-door Dispensary patients 1,635 were original admissions, and 525 were repetitions from month to month, making a total of 2,217 patients.

The Hospital, which is located in a central situation, contains two lofty well ventilated wards, and is provided with twelve beds, six for males, and six for females, now fully furnished, besides a large waiting-room, a surgery, kitchen, and nurses' apartments, &c. The in-door patients are visited twice a day, and the attending surgeon delivers a course of Clinical Instruction in the Hospital during the winter session. Thus, while relief is afforded to the poor, labouring under those

maladies which are so prevalent in this country, and which, in large cities like this, so frequently terminate in the loss of one or even two of the most necessary senses—senses in so many instances furnishing the only means of livelihood to a large portion of our fellow creatures, provision is also made for instruction in two most important, yet neglected branches of medical science.

Each patient attending this Institution, with the exception of a few paupers, pays sixpence per month, for medicine and attendance at the Dispensary; and those who are admitted into Hospital, and can afford it, pay one shilling per week, which assists in defraying a portion of the expenses of the establishment.

This system of partial payments has been found to work exceedingly well. It produces care, regularity, and attention; and induces a spirit of independence amongst the lower classes of society, worthy of countenance and support—while, the sum of £50 thus obtained during this, the first year of the Institution, is in itself a sufficient guarantee to the public and its supporters, that its benefits are appreciated by the poor, numbers of whom seek its advantages from most distant parts of the country.

An accurate registry of each patient has been preserved, in which the sex, age, disease, treatment, and result, as far as such could be obtained, together with other minor details, such as date, season, duration of the affection, both previous and subsequent to admission, &c., are specified. A tabulated arrangement of such essential portions of this as could possibly be compressed within the limits of a Report, like the present, is here annexed, and the Committee feel that in presenting such a document, (which will be carefully continued from year to year,) to the faculty, and to the officers of similar Institutions elsewhere, they are furnishing their mite to the valuable and now generally cultivated science of medical statistics.

WILLIAM LONGFIELD,
Secretary.

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FOURTH REPORT

OF

ST. MARK'S

OPHTHALMIC HOSPITAL AND DISPENSARY,

FOR

DISEASES OF THE EYE AND EAR.

1847–50.

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1850.

6

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FOR

DISEASES OF THE EYE AND EAR,

MARK-STREET.

1847-50.

Managing Committee:

SIR EDWARD BOROUGH, Bart.	JAMES R. STEWART, Esq.
ALEXANDER FERRIER, Esq.	ROBERT CALLWELL, Esq.
THOMAS HUTTON, Esq.	JOHN O. BONSALL, Esq.
WILLIAM R. WILDE, Esq.	WILLIAM LONGFIELD, Esq.

Secretary and Treasurer.

Medical Attendants:

Surgeon, WILLIAM R. WILDE, F.R.C.S.

Consulting Physician, ROBERT J. GRAVES, M.D.

Consulting Surgeon, SIR PHILIP CRAMPTON, Bart.

Assistant, Mr. GRAY.

Cupper, Mr. MAPLESON. Optician, Mr. YEATES.

ANNUAL REPORT.

The Committee, in publishing their Report of this Institution for the last three years,—from 1st March, 1847, to 1st March, 1850—beg to call the attention of the Subscribers and the Public to the following statement.

Since the publication of the last Report, the City of Dublin as well as the country generally has passed through a period of unexampled calamity, which has produced, in consequence of the great distress that prevailed, an increased demand upon our Public Charities and Eleemosynary Institutions—while at the same time our limited resources, chiefly derived from voluntary contributions, have lessened in an inverse ratio. The subscriptions which, for the three years previous to March, 1847, averaged £72 per annum, have scarcely amounted to £50 annually, for a similar period since, and the small sum usually paid by the Dispensary Patients, has, as might be expected, considerably lessened. The Committee have likewise to lament the death of the Queen Dowager, who was a noble benefactress to this Institution. Yet, notwithstanding these adverse circumstances the Committee have great pleasure in stating, that by careful management and the strictest economy, they have not only been able to keep the Institution out of debt, but that there is now a considerable balance in the Treasurer's hands.

Since the publication of the last Report, 236 patients, 156 males and 80 females, have been admitted into the Wards of the Hospital, all of whom were cases of the greatest severity, either persons labouring under total blindness, or suffering from such accidents or violent diseases as threatened sudden destruction to vision. Of these, 97 were persons affected with Cataract, 9 of whom were born blind, or with such defective vision as rendered them incapable of following any useful occupation. All of these latter have received their sight. Of the former, 85 per-

sons were restored to sight. During the last three years, 512 operations have been performed at the Hospital. Of these, together with the patients treated within the Institution, tables are given in the subjoined Medical Report.

In the Dispensary, 6,071 patients received medicine and advice. Of these, 4,775 were original applications, and 1,296 renewals from month to month, or re-admissions after a short lapse of time; making, together with those cases admitted into Hospital or benefited by operation, an average of 2,135 persons relieved annually, at a cost of 1*s.* 6½*d.* per patient.

Annexed to this Report is the Medical Classified Statistical Return of the diseases, ages, sexes, colour of the eye, and other subjects of scientific interest in 4,066 Ophthalmic Patients, extracted from the accurate registry kept in the Institution, and of 783 persons affected with Diseases of the Ear. The publication of the valuable Statistical Tables annexed to this Report is, the Committee feel, tending to the advancement of Medical Science: and the number of Pupils who have recently received instruction at the Hospital, is daily extending the benefits of the Institution not only in Ireland but throughout the British dominions. The Dispensary is open on the mornings of Tuesdays and Fridays, from 10 o'clock till 12. Operations are performed and Clinical instruction given during the same hours on Wednesdays. Accidents attended at all times.

Since St. Mark's Hospital was opened as an Ophthalmic and Aural Institution in 1844, there have been 515 patients treated in the house, and 12,818 received Advice and Medicine, or had Operations performed at the Dispensary. The present daily average attendance is 130.

The audited accounts, together with a list of Subscribers are subjoined, as also a list of the Benefactors of this Institution since its commencement. The income of the Institution is derived from subscriptions and voluntary contributions, an equivalent to which has been annually granted by the Grand Jury of the City of Dublin, at the Easter and Michaelmas Terms since 1844; a special Hospital Fund created in 1745 by means of a Lottery, the residue of which, together with some bequests, amounting altogether to £895 17*s.* 3*d.*, is vested in the Commissioners of Charitable Bequests, the interest of which sum, amounting to

£29 19*s.* 6*d.* annually, is paid over to the Treasurer; and a Fund created by the patients themselves, the great majority of whom pay a trifling sum monthly, which, while it produces care, regularity, and attention, induces a spirit of independence among the lower classes of society worthy of countenance and support. From these three sources the average income of the Institution during the last three years has been £181 3*s.* 6½*d.*, and the expenditure, including the supply of Spectacles and Cataract Glasses, £165 15*s.* 4½*d.* The increased balance observed in the account for the past year, arises from the introduction into the credits of the Michaelmas Grand Jury Grant for 1849, in order to close the accounts of the Institution completely before making any move or alteration in the present establishment. The Grand Jury are furnished with the Hospital Accounts every half year.

The Hospital contains at present accommodation for 14 intern patients; and as a large proportion of those who are admitted into this Institution come from remote country parts, the Committee beg to impress upon the Nobility and Gentry the claim which this Hospital has upon their bounty and support.

As the Hospital in Mark-street is very incommodious, quite incapable of containing the crowds who attend the Dispensary, numbers of whom are obliged to remain in the street while waiting to be relieved,—being but a portion of the Widows' Alms House of St. Mark's parish, being totally devoid of rere, and rendered from its contiguity to Townsend-street, and its want of proper sewerage, less healthy than is desirable, the Committee have been for some time upon the look out for a house affording better accommodation and in a more healthful locality. An opportunity has recently occurred which will enable them to remove the Hospital to a house, in every way suited for the purpose, and situated in one of the most central and healthful localities in the City of Dublin. The building originally built in 1824, and since used as a School of Medicine in Park-street, has been purchased for the Hospital, and is now undergoing the necessary repairs for the accommodation of patients. These alterations will cost about £200, and the Committee earnestly call upon the benevolent to come forward to aid by their contributions the establishment of an Institution which confers so many blessings upon all ranks of society.

It is but too well known that the Parliamentary Grants to the General Hospitals in this City are about to be withdrawn, and several of them have already been lessened. As those large establishments cannot, under such circumstances, be expected to afford the usual relief to the poor, the claims upon an Institution such as this will naturally be increased four-fold; and the Committee earnestly hope that an Hospital supported almost entirely by *voluntary contributions* will, in Ireland, derive that support equivalent to the resources of the country, which similar Institutions elsewhere receive.

The building in Park-street, will, when the alterations are completed, be a public ornament; and being surrounded by an enclosed plot of ground, and in the immediate vicinity of the College Park, it is remarkably healthy, while the class of diseases to be treated therein secures the inhabitants of the adjoining streets and squares in the wealthiest and most respectable part of Dublin, from any annoyance arising from the introduction of infectious or epidemic diseases. The new Hospital will contain twenty beds, and also some accommodation for the reception of a few pay patients of slender means, who will have the advantages allowed a similar class in Sir Patrick Dun's and the other General Hospitals which have pay wards. The Hospital Assistant will also be provided with apartments.

Donations and Subscriptions will be thankfully received at the Banks of Messrs. La Touche & Co., and Messrs. Boyle, Low, Pim, & Co., by the Secretary, William Longfield, Esq., 19, Harcourt-street, by the Medical Attendant, W. R. Wilde, Esq., 21, Westland-row, or by any of the Committee.

WILLIAM LONGFIELD,
Secretary.

2nd April, 1850.

ST. MARK'S HOSPITAL, IN ACCOUNT WITH THE TREASURER.

From 1st March, 1847, to 1st March, 1848.

Dr. *Cr.*

	£	s.	d.		£	s.	d.
By Balance in hands from last account, March, 1847,	47	15	9	To Medicines,	43	8	3
,, Special Hospital Fund,	29	19	6	,, Instruments,	3	5	10
,, Subscriptions and Hospital Patients,	57	14	6	,, Cabinet Glasses,	1	3	6
,, Sir Patrick Dun's,	46	15	0	,, Leeches,	7	3	9½
,, City Grant, Michaelmas Term, 1846,	42	19	0	,, Coals,	6	15	0
,, Ditto, Easter Term, 1847,	38	9	0	,, Assistants' Salaries,	19	10	0
				,, Nurses' Wages,	12	13	11
				,, Stationery and Printing,	2	4	1
				,, Furniture and Repairs,	5	13	3
				,, Sundries,	1	15	2
				,, Washing,	3	9	1
				,, Soap and Candles,	3	10	6
				,, Collector's Fees,	1	10	0
				,, Rent,	10	0	0
				,, Bread,	23	1	6½
				,, Meat,	3	1	10
				,, Milk,	23	5	6½
				,, Pauper Patients,	1	2	3
				Balance in hands,	83	3	7¾
	£263	13	3		£263	13	3

I have examined above Account, compared Vouchers, and find Balance to Credit of Hospital of £83 3s. 7¾*d.*

12th February, 1850. ROBERT CALLWELL.

ST. MARK'S HOSPITAL, IN ACCOUNT WITH THE TREASURER.

Dr. *From 1st March, 1848, to 1st March, 1849.* *Cr.*

	£	s.	d.		£	s.	d.
By Balance in hands, March 1st, 1848,	83	5	7½	To Medicines,	35	4	6
,, Special Hospital Fund,	29	19	6	,, Instruments,	4	16	0
,, Dispensary and Hospital Patients,	37	2	8	,, Cataract Glasses, Spectacles, &c.,	2	9	6
,, Subscriptions,	50	2	6	,, Leeches,	3	19	4
,, City Grant, Michaelmas Term, 1847,	9	0	0	,, Assistants' Salaries,	14	10	0
,, Ditto, Easter Term, 1848,	11	18	6	,, Nurses' Wages,	13	0	0
				,, Stationery and Printing,	3	6	6
				,, Furniture and Repairs,	3	18	3
				,, Sundries,	2	1	3
				,, Washing,	1	10	2
				,, Soap and Candles,	3	1	10
				,, Coals,	6	16	0
				,, Collector's Fees,	1	10	0
				,, Rent,	10	0	0
				,, Bread,	13	10	11
				,, Meat,	4	3	5
				,, Straw,	0	15	3
				,, Milk,	12	16	4
				,, Pauper Patients leaving Hospital,	0	18	2
				,, Taxes,	0	2	6
				,, Groceries,	0	18	2
				Balance on hands,	82	0	8½
	£221	8	9½		£221	8	9½

I have examined above Accounts, and compared Vouchers, and find Balance in hands of Treasurer £82 0*s.* 8½*d.*

12th February ROBERT CALLWELL.

ST. MARK'S HOSPITAL, IN ACCOUNT WITH THE TREASURER.

Dr. *From 1st March, 1849, to 1st March, 1850.* *Cr.*

	£	s.	d.		£	s.	d.
By Balance in hands, 1st March, 1849,	82	0	8½	To Medicines,	43	0	2
,, Special Hospital Fund,	29	19	6	,, Instruments,	4	0	6
,, Dispensary and Hospital Patients,	26	18	6	,, Spectacles, Cataract Glasses, &c.,	5	14	6
,, Subscriptions,	51	18	6	,, Leeches,	5	8	2½
,, City Grant, Michaelmas Term, 1848,	20	0	0	,, Assistants' and Cupper's Salaries,	16	0	0
,, Ditto, Easter Term, 1849,	29	0	0	,, Nurses' Wages,	13	0	0
,, Ditto, Michaelmas do., 1849,	31	13	6	,, Stationery and Postage,	4	5	0
				,, Furniture and Repairs,	3	11	0
				,, Sundries,	2	8	3
				,, Washing,	1	10	0
				,, Soap and Candles,	3	1	6
				,, Coals,	5	8	6
				,, Collector's Fees,	2	0	0
				,, Rent,	10	0	0
				,, Bread,	20	17	3
				,, Meat,	10	2	6
				,, Groceries,	0	8	2
				,, Milk,	26	0	0
				,, Pauper Patients leaving Hospital,	0	15	0
					177	10	6½
				Balance on hands,	94	0	2
	£271	10	8½		£271	10	8½

I have examined above Accounts, and compared Vouchers, and find that a Balance of £94 0*s.* 2*d.* remains in Treasurer's hands.

5th March, 1850. ROBERT CALLWELL.

CONTRIBUTORS

TO

ST. MARK'S OPHTHALMIC HOSPITAL,

SINCE ITS COMMENCEMENT IN 1844.

	1844-5.	1845-6.	1846-7.	1847-8.	1848-9.	1849-50
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Her Majesty the Queen Downger,	—	—	—	—	10 0 0	—
His Grace the Archbishop of Dublin,	5 0 0	5 0 0	5 0 0	5 0 0	5 0 0	5 0 0
His Grace the Duke of Leinster,	—	2 0 0	—	—	—	—
The Countess of St. Germans,	2 0 0	—	—	—	—	—
Right Hon. the Earl of Rodon,	5 0 0	—	5 0 0	—	—	—
Right Hon. the Earl of Leitrim,	1 0 0	5 0 0	1 0 0	—	1 0 0	1 0 0
Lord Mountmorford,	5 0 0	2 0 0	—	—	—	—
Lady Fitzgerald,	—	5 0 0	—	—	—	—
Lady Louisa Le Poer Trench,	—	—	0 10 6	—	—	—
The Hon. Mrs. Lawless, Lyons,	—	—	—	—	1 0 0	1 0 0
The Honourable and Very Rev. the Dean of St. Patrick's,	1 0 0	1 0 0	1 0 0	2 0 0	—	—
The V. Rev. the Dean of Leighlin,	—	1 0 0	—	—	—	—
The Very Rev. Dean Myler,	—	—	—	—	1 0 0	1 0 0
The Venerable the Archdeacon of Glendalough,	1 0 0	—	1 0 0	—	1 0 0	1 0 0
The Right Honourable Chief Justice Pennefather,	2 0 0	1 0 0	1 0 0	—	—	—
The Hon. Baron Pennefather,	1 0 0	—	1 0 0	1 0 0	1 0 0	1 0 0
The Hon. Justice Crampton,	5 0 0	2 0 0	1 0 0	—	1 0 0	1 0 0
Sir Philip Crampton, Bart.,	2 0 0	2 0 0	—	—	—	—
Sir Edward Borough, Bart.,	1 0 0	1 1 0	2 1 0	1 1 0	1 1 0	1 1 0
Sir George Preston, Bart.,	—	—	3 0 0	—	—	—
Sir Edward Denny, Bart.,	—	1 1 0	—	—	—	—
Rev. Dr. Wray, Vice-Provost, T.C.D.,	2 0 0	—	2 0 0	—	—	—
Rev. Dr. Wall, Vice-Provost, T.C.D.,	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
Rev. H. Lloyd, P.R.I.A.,	1 0 0	—	1 0 0	—	—	—
Mrs. Digges La Touche,	1 0 0	—	—	—	—	—
Mrs. Sandford,	10 0 0	1 0 0	—	—	—	—
John Hutton and Sons,	7 0 0	5 0 0	5 0 0	3 0 0	3 0 0	3 0 0
Hugh Barton, Esq., Straffan,	1 0 0	1 0 0	2 0 0	—	2 0 0	2 0 0
Edward Litton, Esq., Master in Chancery,	1 0 0	—	—	—	—	—
John Radcliff, Esq., Commissioner Board of Works,	1 0 0	1 0 0	—	—	—	—
James Ferrier, Esq.,	1 1 0	1 1 0	1 1 0	1 0 0	1 1 0	1 1 0
Alexander Ferrier, Esq.,	1 1 0	1 1 0	1 1 0	1 0 0	—	1 1 0
Thomas Wilson, Esq.,	3 2 0	1 0 0	2 0 0	—	1 0 0	1 0 0
Robert Caldwell, Esq.,	1 0 0	1 0 0	1 0 0	—	1 0 0	1 0 0
B. M. Taboteau, Esq.,	1 0 0	1 0 0	1 0 0	—	—	—
J. R. Steward, Esq.,	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
Henry Courtenay, Esq.,	5 0 0	1 0 0	1 0 0	1 0 0	—	1 0 0
John O. Bonnail, Esq.,	1 0 0	1 0 0	—	1 0 0	—	1 0 0
Henry Bewley, Esq.,	1 0 0	1 0 0	2 0 0	1 0 0	1 0 0	1 0 0
William Ellington, Esq.,	—	1 0 0	1 0 0	1 0 0	1 1 0	1 1 0
Henry Pakenham Mahon, Esq., High Sheriff, Roscommon,	—	1 0 0	—	—	—	—
William Bond, Esq., The Argory, Armagh,	—	1 0 0	—	—	—	—
Captain Bourne, R.N.,	2 0 0	—	—	—	—	—
Gilbert Burns, Esq.,	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
Francis Codd, Esq.,	1 0 0	—	2 0 0	1 0 0	1 0 0	1 0 0
Henry A. Cowper, Esq.,	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
John Cumming, Esq.,	1 0 0	—	—	—	—	—
J. W. Cusack, M.D.,	1 0 0	1 0 0	2 1 0	1 1 0	1 1 0	1 1 0
Robert J. Graves, M.D.,	1 0 0	1 0 0	—	—	—	—
William Stokes, M.D.,	1 0 0	1 1 0	2 2 0	1 1 0	—	1 1 0

	1844-5.	1845-6.	1846-7.	1847-8.	1848-9.	1849-50
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. M. O'Farrell, M.D.,	—	1 0 0	—	1 0 0	—	—
J. Dawson, M.D., Dungarvan,	1 0 0	—	—	—	—	—
J. Madden, M.D., Celbridge,	—	—	—	1 0 0	—	—
James Dowman, Esq., Cork,	—	1 0 0	—	2 2 0	—	—
Mrs. Edgeworth, Edgeworthstown,	—	1 0 0	—	—	—	—
Robert Alexander, Esq., Loughtickland,	—	2 0 0	1 0 0	—	1 0 0	1 1 0
J. S. Cornelis, Q.C.,	—	—	1 1 0	1 1 0	—	1 1 0
Mrs. John Litton,	—	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
George Smith, Esq.,	—	2 0 0	1 0 0	1 0 0	—	—
Thomas Pim, junior, Esq.,	1 0 0	—	1 0 0	1 0 0	1 0 0	1 0 0
William H. Pim, Esq.,	1 1 0	—	1 1 0	1 0 0	1 0 0	1 0 0
Mrs. Evans, Portman,	—	—	1 0 0	—	—	1 0 0
George Roe, Esq.,	—	1 0 0	2 0 0	—	1 0 0	1 0 0
Mrs. Roe,	—	—	1 0 0	—	—	—
J. F. Waller, Esq.,	—	—	—	0 10 0	—	—
Miss Aldridge,	—	0 7 6	0 5 0	0 5 0	0 5 0	—
Charles T. Weber, Esq.,	1 0 0	0 10 0	0 10 0	—	0 10 0	0 10 0
John Fynn, Esq., Ballymaghbon,	1 0 0	—	1 0 0	1 0 0	—	—
John Drummond, Esq.,	—	—	—	1 0 0	—	—
Mrs. Neville,	—	1 0 0	—	1 0 0	—	—
Mrs. Birchall,	—	—	—	—	1 0 0	1 0 0
Daniel Nugent, Esq.,	1 0 0	1 0 0	—	1 0 0	—	1 0 0
Miss Pike,	1 0 0	0 15 0	1 5 0	0 12 6	0 10 0	—
Mrs. Vincent,	1 0 0	1 0 0	1 0 0	1 0 0	—	—
Mrs. Lock,	1 5 0	—	—	1 0 0	1 0 0	—
Messrs. Allen and Son,	1 0 0	1 1 0	2 2 0	1 1 0	—	1 1 0
Robert Gray, Esq.,	1 0 0	—	—	—	—	—
William Longfield, Esq.,	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
Mrs. William Hunt,	1 0 0	—	1 0 0	1 0 0	1 0 0	1 0 0
Robert Smith, Esq.,	1 0 0	1 0 0	—	—	—	1 0 0
Alexander Thom, Esq.,	—	1 0 0	1 0 0	—	—	1 0 0
Mr. William Kelly,	—	—	—	1 0 0	—	1 0 0
Mr. Edmondson,	—	—	—	—	0 2 6	—
Mrs. M'Kenna,	—	—	—	—	1 0 0	—
Mr. John Fitzgibbon,	—	—	—	—	1 0 0	—
Mr. Patrick Fitzgerald,	—	—	—	—	0 10 0	—
Mr. J. Cody,	—	—	—	—	—	0 10 0
J. Walker, M.D., Liverpool,	—	—	1 0 0	—	—	—
James Haughton, Esq.,	0 10 0	—	0 10 0	—	—	0 10 6
Mr. J. Short,	—	—	—	—	—	1 0 0
Mr. M. Sorry,	—	—	—	—	—	1 0 0
Wrigley Grimshaw, F.R.C.S.,	1 0 0	—	—	—	—	—
William Robert Wilde, F.R.C.S.,	3 0 0	1 1 0	1 0 0	1 1 0	1 1 0	1 1 0
John A. Green, Esq.,	—	1 0 0	—	—	—	—
William Hutchinson, Esq.,	0 10 6	—	—	—	—	—
William Hyde, Esq.,	1 10 0	—	—	—	—	—
Miss M. Kennedy,	—	1 0 0	—	—	—	—
Charles Kennedy, Esq.,	1 0 0	—	—	—	—	—
J. Kenney, M.R.C.S.E.,	—	1 0 0	—	—	—	—
Mr. James Kelly,	0 5 0	—	—	—	—	—
Mrs. Longfield,	1 0 0	—	—	—	—	—
James M'Glashan, Esq.,	1 0 0	—	—	—	—	—
Mr. Melville,	0 10 0	—	—	—	—	—
Laurence Mooney, Esq.,	1 0 0	1 0 0	—	—	—	—
J. Morton, Esq., Berris,	—	1 0 0	—	—	—	—
Daniel Pakenham, Esq.,	1 0 0	1 0 0	—	—	—	—
Pilots' Fund Society, Kingstown,	1 10 0	—	—	—	—	—
William Reynolds, Esq.,	1 0 0	—	—	—	—	—
John Jones Higby, Esq.,	0 10 0	—	—	—	—	—
Mrs. Hobkins,	—	1 0 0	—	—	—	—
T. J. Quinton, Esq.,	1 0 0	1 0 0	1 0 0	—	—	—
Henry Samper, Esq., Castleres,	—	0 10 0	0 10 0	—	—	—
E. C. Smith, Esq.,	0 5 0	—	—	—	—	—
Mrs. Magee,	1 0 0	—	—	—	—	—
William Todhunter, Esq.,	1 0 0	—	—	—	—	—
Mr. Waddle,	0 5 0	—	—	—	—	—
Miss Bell, Fairylawn,	—	1 0 0	—	—	—	—
J. P. Bell, Esq., Fernery,	—	1 1 0	—	—	—	—
John Evans, Esq., M.R.C.S.,	—	—	1 0 0	—	—	—
J. M'Dermott, M.D.,	—	—	1 1 0	—	—	—
Captain Stritch,	—	—	1 0 0	—	—	—
Mrs. Brereton,	—	—	0 5 0	—	—	—
Medicus,	—	1 0 0	—	—	—	—

Patients admitted into St. Mark's Hospital, from 1st March, 1846, to 1st March, 1850.

Diseases.	1846-7.			1847-8.			1848-9.			1849-50.			General Total.		
	Males.	Fem.	Total.	Males.	Fem.	Total.	Males.	Fem.	Total.	Males.	Fem.	Total.	Males.	Fem.	Total.
Cataract,	28	15	43	13	4	17	10	6	16	30	13	43	81	38	119
Do. Congenital,	4	3	7	–	–	–	–	–	–	4	5	9	8	8	16
Do. Traumatic,	1	–	1	6	3	9	1	1	2	3	–	3	11	4	15
Dislocation of Lens,	2	2	4	–	–	–	3	–	3	3	1	4	8	3	11
Ophthalmitis,	9	8	17	7	2	9	2	2	4	3	–	3	21	12	33
Injuries,	3	1	4	3	–	3	2	–	2	3	2	5	11	3	14
Ophthalmia,	–	1	1	2	2	4	–	2	2	1	1	2	3	6	9
Pannus,	12	2	14	3	1	4	1	4	5	1	7	8	17	14	31
Tubercular Disease,	–	1	1	–	–	–	–	–	–	–	–	–	–	1	1
Staphyloma Cornea,	1	–	1	1	1	2	1	2	3	2	1	3	5	4	9
Ulcer of Cornea,	4	2	6	5	2	7	–	–	–	4	1	5	13	5	18
Cornitis,	–	1	1	–	–	–	1	–	1	–	2	2	1	3	4
Choroido-Iritis,	2	–	2	–	–	–	–	–	–	2	–	2	4	–	4
Syphilitic Iritis,	–	2	2	–	–	–	–	–	–	3	–	3	3	2	5
Atrophy of Eye,	1	–	1	–	–	–	–	–	–	–	1	1	1	1	2
Closed Pupil,	2	1	3	4	1	5	3	1	4	3	3	6	12	6	18
Amaurosis,	–	2	2	2	3	5	1	–	1	1	–	1	4	5	9
Entropium,	2	1	3	2	4	6	–	1	1	–	–	–	4	6	10
Ectropium,	2	–	2	1	–	1	–	–	–	4	–	4	7	–	7
Epicanthus,	–	1	1	1	–	1	–	–	–	–	–	–	1	1	2
Fungus of Conjunctiva,	–	1	1	–	–	–	–	–	–	–	–	–	–	1	1
Injury of Lachrymal Sac,	–	–	–	1	–	1	–	–	–	–	–	–	1	–	1
Injury of Orbit,	–	–	–	1	–	1	–	–	–	2	–	2	3	–	3
Prolapsed Iris,	–	–	–	–	–	–	1	–	1	–	–	–	1	–	1
Pterygium,	–	–	–	–	–	–	–	–	–	3	–	3	3	–	3
Inflammation of the Ear,	–	–	–	1	–	1	–	–	–	–	–	–	1	–	1
Tumour in Throat,	–	–	–	–	–	–	–	–	–	2	–	2	2	–	2
Unspecified,	–	–	–	3	1	4	–	–	–	–	–	–	3	1	4
	73	44	117	56	24	80	26	19	45	74	37	111	229	124	353

Operations performed at St. Mark's Hospital, between 1st March, 1847, and 1st March, 1850.

Diseases and Operations.	1847-8.			1848-9.			1849-50.			Total 3 Years.				
	Males.	Fem.	Total.	Males.	Fem.	Total.	Males.	Fem.	Total.	Males.	Fem.	Total.		
Cataract, By Extraction,	7	8	15	6	6	12	19	9	28	32	23	55	}	145
Cataract, By Solution, through Cornea,	16	11	27	21	10	31	10	8	18	47	29	76	}	
Cataract, Do. through Sclerotic,	3	2	5	2	2	4	2	3	5	7	7	14		
Formation of Artificial Pupil,	4	–	4	16	6	22	9	12	21	29	18	47		
Removal of Staphyloma,	3	1	4	1	3	4	1	2	3	5	6	11		
Do. of Pterygium,	2	1	3	4	2	6	3	1	4	9	4	13		
Strabismus, Right Eye,	6	3	9	10	7	17	7	5	12	23	15	38	}	56
Strabismus, Left Eye,	–	3	3	3	2	5	3	1	4	6	6	12	}	
Strabismus, Both Eyes,	–	1	1	–	3	3	–	2	2	–	6	6		
Entropium and Trichiasis,	6	8	14	14	14	28	7	13	20	27	35	62		
Ectropium,	1	1	2	5	2	7	1	4	5	7	7	14		
Removal of Tarsal Tumours,	10	8	18	15	8	23	12	4	16	37	20	57		
Operations on Lachrymal Sac,	10	14	24	–	9	9	–	17	17	10	40	50		
Plepharo-Plastic Operations,	1	–	1	1	–	1	3	1	4	5	1	6		
Polypus of the Ear,	10	11	21	12	8	20	5	4	9	27	23	50		
Removal of Tonsil,	–	–	–	–	–	–	–	1	1	–	1	1		
Epicanthus,	–	1	–	–	–	–	–	–	–	–	–	–		
Total,	79	72	151	110	82	192	82	87	169	271	241	512		

CLASSIFICATION of PATIENTS affected with DISEASES of the EYE, registered at St. MARK'S HOSPITAL, during the three years ending 1st March, 1850, according to the Diseases, Ages, Sexes, and Colour of the Eye, &c.

DISEASES.	AGES AND SEXES.															
	Under 1.		1 to 5.		6 to 10.		11 to 15.		16 to 20.		21 to 25.		26 to 30.		31 to 40.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Affections of the Eyelids. Inflammation of Palpebræ,	1	.	6	5	2	3	2	1	.	1	.	3	2	.	3	3
Psorophthalmia,	1	2	41	45	34	32	26	15	9	12	1	2	4	11	7	4
Entropium and Trichiasis,	.	.	1	.	.	.	.	1	2	4	3	6	2	8	4	7
Ectropium,	.	.	1	3	2	.	.	.	1	1	.	1	2	1	1	3
Diseases of Lachrymal Apparatus,	.	.	3	4	.	1	1	5	7	4	7	11	2	11	5	5
Disease of Caruncle,	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.
Palpebral Tumours,	.	.	.	3	.	.	1	1	2	6	8	3	6	5	7	1
Injuries of Lids,	.	.	1	.	.	2	2	.	1	1	.	1	3	.	2	1
Anchyloblepharon,	.	.	.	.	.	.	3	.	.	.	1	1	2	.	1	.
Ptosis,	.	.	.	.	1	2	.	.	.	1	.	.	1	3	3	2
Epicanthus,	.	.	.	.	1	.	.	.	1	1	.	1	.	1	.	.
Ophthalmia. Conjunctivitis—Simple Catarrhal	2	1	23	17	13	17	5	4	8	13	2	6	5	4	10	9
Pustular Ophthalmia,	7	3	57	75	56	46	23	30	24	23	10	11	11	11	12	15
Catarrho Pustular, do.	.	.	8	14	18	15	7	4	6	3	5	1	2	1	5	3
Irritable, do.	1	2	25	41	7	3	3	3	.	1	1	1	.	2	2	2
Strumous, do.	.	.	46	75	35	55	26	19	11	14	9	7	19	15	15	11
Chronic, do.	.	.	5	3	6	5	4	8	17	11	13	15	14	14	20	41
Do. with Granular Lids,	.	.	.	.	2	1	1	4	3	6	3	3	3	6	8	1
Post-Febrile, do	.	.	1	.	1	.	1	.	.	.	.	.	2	.	1	.
Lacteal, do.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1
Purulent do.—Gonorrhœal,	.	.	.	.	.	.	.	.	3	.	3	.	1	.	1	.
Do. Infantile,	13	13	6	.	.	.	1	.	1	1	.	.	.	.	.	.
Sclerotitis—Rheumatic,	.	.	.	2	3	.	.	1	3	2	2	4	1	4	8	12
Ophthalmitis,	.	.	.	1	3	1	4	.	2	3	2	1	6	3	5	8
Pterygium,	.	.	.	.	.	.	.	.	1	.	3	.	2	.	2	1
Affections of the Cornea. Pustule in Cornea,	1	.	9	19	12	7	3	8	2	2	2	3	1	3	2	3
Hypopion,	.	.	.	2	2	2	.	.	.	.	1	.	.	.	2	.
Onyx,	.	1	4	6	3	6	1	1	7	1	2	.	4	.	2	.
Sloughing Cornea,	.	.	1	.	2	1	.	.	.	.	2	2	.	.	6	.
Ulcer of Cornea,	2	4	17	26	22	25	12	12	11	10	17	8	12	11	16	6
Corneitis, Acute,	.	.	5	7	11	7	7	12	1	4	4	.	1	.	1	1
Corneitis, Chronic,	.	.	3	.	3	1	2	2	2	2	.	5	1	2	1	.
Pannus,	.	.	.	4	5	5	5	16	15	24	13	10	12	13	19	6
Opacities, Nebulæ, &c.	1	5	20	32	16	18	12	14	4	11	9	6	6	3	4	9
Leucoma,	1	.	2	4	3	4	1	2	.	5	3	2	2	2	1	1
Synechia Anterior,	2	.	.	2	3	1	3	1	5	4	2	2	1	2	4	2
Injuries of Cornea—Contused,	.	1	1	.	1	1	.	.	2	.	1	.	6	.	5	.
Do. from fragments of Iron,	1	.	1	1	2	.	2	.	2	.	4	.	4	.	7	1
Do. from Lime, Acids, &c.	.	.	2	1	1	.	.	.	.	1	2	.	2	.	1	.
Conical Cornea,	.	.	.	1	.	.	.	1	1	1	.	.	.	.	.	.
Staphyloma Corneæ,	1	.	1	2	1	2	4	1	1	1	4	.	1	1	2	1
Aquo-Capsulitis,	.	.	.	.	.	.	1	.	.	2	.	1	1	1	2	.
Affections of Iris and Choroid. Iritis,	.	.	1	.	1	.	.	1	2	3	3	4	4	5	4	2
Do. Rheumatic,	.	.	.	.	.	.	.	.	.	4	3	2	1	2	3	4
Do. Syphilitic,	.	.	.	.	.	.	.	.	6	2	12	.	3	2	6	2
Choroido—Iritis,	.	.	1	.	.	1	.	.	1	2	2	1	6	7	6	1
Prolapsed Iris,	1	2	2	.	1	2	2	.	1	.	2	.	3	.	.	1
Injury of Iris,	.	.	.	1	1	1	1	.	.	.	1	.	.	1	.	.
Choroid, Chronic disease of,	.	.	.	.	.	1	.	1	2	2	2	5	.	3	7	4
Staphyloma of Choroid,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
Synechia Posterior—Closed Pupil	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1
Mydriasis and Tremulous Iris,	.	.	.	.	1	.	1	.	.	.	1	1	.	.	.	.
Congenital defects of Iris,	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Affections of Lens. Cataract—Lenticular,	.	.	.	1	1	.	.	1	2	1	.	2	2	5	7	4
Do. Capsular,	.	.	1	.	.	.	.	1	.	.	.	3	.	2	4	4
Do. Congenital,	.	.	.	1	1	1	2	.	1	.	1	.	.	.	1	.
Do. Traumatic,	.	.	.	1	1	.	2	1	1	2	2	1	.	2	.	1
Dislocation of Lens,	1	.	.	.	1	.	.	.	.	.	.	.	1	2	.	1
Affections of Retina, &c. Asthenopia—Impaired Vision,	.	.	2	.	.	.	2	2	5	6	5	4	14	8	27	8
Congestion,	.	.	.	.	.	2	.	1	2	1	4	.	2	3	3	3
Amaurosis, partial,	.	.	1	1	1	.	1	.	1	.	.	1	2	4	3	2
Do. complete,	.	.	2	.	4	.	2	2	8	7	3	5	4	3	25	8
Atrophy of Eye,	.	.	1	.	.	1	.	.	.	.	.	.	1	1	.	.
Myopia,	.	.	.	.	1	.	.	.	1	.	1	1	.	1	1	.
Strabismus,	.	1	14	7	12	5	5	7	3	2	.	5	1	1	.	2
Lupus and Cancer,	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.
Total Diseases of Eye,	36	35	329	409	300	281	186	188	189	210	182	151	185	196	257	235
Total Diseases of Ear,	.	.	33	35	64	34	34	35	34	45	48	40	40	35	87	31
Diseases of Throat, &c.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
General Total.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

DISEASES.	41 to 50.		51 to 60.		60 and upwards		General Total.			COLOUR OF EYES. Grey.			Blue.			Hazel.			Brown.			YEARS. 1847, 1848.	1848, 1849.	1849, 1850.
	M.	F.	M.	F.	M.	F.	M.	F.		M.	F.		M.	F.		M.	F.		M.	F.				
Inflammation of Palpebræ,	.	.	.	.	.	.	22	18	40	11	7	18	4	5	9	5	3	8	2	2	5	16	13	11
Psorophthalmia,	1	1	3	2	.	.	123	137	260	68	69	137	23	30	53	10	14	24	22	24	46	91	95	74
Entropium and Trichiasis,	2	3	3	3	.	.	16	46	62	4	24	28	7	7	14	1	5	6	4	10	14	24	12	26
Ectropium,	3	4	3	6	.	.	15	10	25	9	4	13	2	4	6	1	2	3	3	.	3	8	5	12
Diseases of Lachrymal Apparatus,	3	1	6	1	.	.	27	53	80	11	26	37	8	4	12	3	3	6	7	20	27	26	22	30
Disease of Caruncle,	2	1	2	7	.	.	.	2	2	.	1	1	.	1	1	.	.	.	.	.	.	1	1	.
Palpebral Tumours,	3	3	4	2	.	.	31	30	61	20	15	35	1	.	1	2	3	5	8	12	20	19	16	26
Injuries of Lids,	1	.	1	.	.	.	11	4	15	5	3	8	3	.	3	.	.	.	3	1	4	2	4	9
Anchyloblepharon,	.	.	.	.	.	.	5	1	6	2	1	3	2	.	2	.	.	.	1	.	1	1	1	4
Ptosis,	1	.	.	.	.	.	5	7	12	1	4	5	1	1	2	.	.	.	3	2	5	4	3	5
Epicanthus,	.	.	.	.	.	.	2	3	5	1	1	2	1	1	2	.	.	.	.	1	1	2	1	2
Conjunctivitis—Simple Catarrhal	3	3	.	2	3	1	82	77	159	37	39	76	18	17	35	10	8	18	17	13	30	71	50	38
Pustular Ophthalmia,	6	5	2	1	.	.	209	215	424	98	104	202	34	36	70	25	24	49	52	51	103	112	143	169
Catarrho Pustular, do.	4	1	.	1	.	.	56	42	98	24	15	39	11	9	20	9	4	13	12	14	26	60	31	7
Irritable, do.	2	.	2	1	.	.	57	56	113	26	26	52	18	14	32	4	7	11	9	9	18	40	36	37
Strumous, do.	.	8	5	3	5	1	164	210	374	83	95	178	36	53	89	11	22	33	34	40	74	96	86	192
Chronic, do.	26	20	5	9	8	10	128	135	263	84	89	173	24	20	44	3	8	11	17	18	35	74	84	101
Do. with Granular Lids,	.	6	.	1	2	1	22	29	51	12	10	22	3	7	10	2	3	5	5	9	14	21	16	14
Post-Febrile, do	.	.	.	.	1	.	7	.	7	3	.	3	2	.	2	.	.	.	2	.	2	5	1	1
Lacteal, do.	.	.	.	.	.	.	.	6	6	.	2	2	.	1	1	.	.	.	.	3	3	2	2	2
Purulent do.—Gonorrhœal,	1	1	.	.	.	.	9	1	10	5	1	6	1	.	1	.	.	.	3	.	3	3	1	6
Do. Infantile,	.	.	.	.	.	.	21	14	35	10	6	16	5	7	12	2	1	3	4	.	4	12	6	17
Sclerotitis—Rheumatic,	3	3	2	1	3	.	27	29	56	12	10	22	8	8	16	2	4	6	5	7	12	38	8	10
Ophthalmitis,	3	3	3	4	5	.	37	26	63	12	10	22	7	3	10	8	5	13	10	8	18	27	20	16
Pterygium,	.	.	1	.	.	.	10	1	11	6	.	6	1	1	2	1	.	1	2	.	2	1	6	4
Pustule in Cornea,	2	1	.	.	.	.	34	46	80	17	22	39	9	12	21	1	3	4	7	9	16	28	27	25
Hypopion,	2	.	3	1	1	.	11	5	16	3	1	4	5	2	7	1	1	2	2	1	3	9	5	2
Onyx,	2	.	2	.	2	2	33	17	50	16	8	24	8	3	11	4	2	6	5	4	9	11	21	18
Sloughing Cornea,	.	1	3	.	1	1	10	6	16	5	2	7	2	2	4	.	.	.	3	2	5	4	9	3
Ulcer of Cornea,	8	1	3	.	11	1	129	106	235	57	51	108	31	23	54	13	9	22	28	23	51	81	76	78
Corneitis, Acute,	3	1	1	.	.	.	33	32	65	18	11	29	9	11	20	3	2	5	3	8	11	22	12	31
Corneitis, Chronic,	.	2	.	1	.	1	12	16	28	7	6	13	3	3	6	.	2	2	2	5	7	12	3	13
Pannus,	12	7	1	2	1	5	87	98	185	52	52	104	16	18	34	6	9	15	13	19	32	54	66	65
Opacities, Nebulæ, &c.	4	6	3	.	4	3	83	107	190	42	55	97	13	14	27	8	16	24	20	22	42	46	82	62
Leucoma,	1	.	1	1	.	1	18	22	40	10	10	20	2	4	6	3	4	7	3	4	7	12	14	14
Synechia Anterior,	.	.	.	.	2	3	22	17	39	19	9	28	3	3	6	.	1	1	.	4	4	5	16	18
Injuries of Cornea—Contused,	.	2	4	.	.	4	20	8	28	10	4	14	6	3	9	.	.	.	4	1	5	10	9	9
Do. from fragments of Iron,	2	.	1	.	1	.	27	2	29	11	.	11	6	1	7	7	.	7	3	1	4	.	13	16
Do. from Lime, Acids, &c.	1	.	.	.	.	.	10	2	12	6	1	7	1	.	1	2	1	3	1	.	1	.	10	3
Conical Cornea,	.	.	.	.	.	.	1	3	4	1	2	3	.	.	.	.	.	.	.	1	1	1	.	3
Staphyloma Corneæ,	.	.	.	.	.	1	16	12	28	8	6	14	2	3	5	3	1	4	3	2	5	10	9	9
Aquo-Capsulitis,	.	1	1	1	.	.	5	6	11	2	3	5	1	1	2	1	1	2	1	1	2	5	4	2
Iritis,	4	2	.	1	1	.	20	20	40	11	14	25	2	2	4	2	2	4	5	2	7	14	13	13
Do. Rheumatic,	5	1	3	1	.	2	14	14	28	7	7	14	2	1	3	2	3	6	2	3	8	8	11	9
Do. Syphilitic,	4	.	.	.	.	.	33	5	38	17	2	19	4	1	5	1	.	1	11	2	13	15	9	14
Choroido—Iritis,	3	1	3	2	3	1	27	18	45	15	7	22	4	4	8	1	2	3	7	5	12	16	18	11
Prolapsed Iris,	2	.	.	.	.	.	12	6	18	5	3	8	1	2	3	1	1	2	5	.	5	7	5	6
Injury of Iris,	.	.	1	.	.	.	4	3	7	3	1	4	1	1	2	.	.	.	.	1	1	1	1	5
Choroid, Chronic disease of,	.	.	3	2	.	.	10	18	28	4	8	12	1	5	6	3	2	5	2	3	5	6	14	8
Staphyloma of Choroid,	2	.	.	.	.	.	3	2	5	3	1	4	.	.	.	.	.	.	.	1	1	1	.	4
Synechia Posterior—Closed Pupil	.	1	1	.	1	.	3	2	5	1	1	2	.	.	.	.	.	.	2	1	3	1	.	4
Mydriasis and Tremulous Iris,	.	.	.	.	.	.	3	1	4	2	1	3	.	.	.	1	.	1	.	.	.	1	2	2
Congenital defects of Iris,	.	.	.	.	.	.	.	1	1	.	1	1	.	.	.	.	.	.	.	.	.	.	1	.
Cataract—Lenticular,	10	7	15	8	20	12	53	41	94	34	20	54	8	9	17	6	6	12	7	6	13	28	26	32
Do. Capsular,	1	1	.	2	3	.	9	11	20	6	5	11	1	3	4	.	.	.	2	3	5	5	5	10
Do. Congenital,	1	.	.	.	.	.	6	2	8	3	1	4	2	.	2	.	.	.	1	1	2	4	3	1
Do. Traumatic,	1	.	.	1	.	1	7	13	20	3	5	8	1	3	4	1	2	3	2	3	5	6	7	7
Dislocation of Lens,	2	2	2	1	1	.	14	5	19	12	3	15	.	.	.	.	.	.	2	2	4	7	3	9
Asthenopia—Impaired Vision,	22	14	9	2	8	2	92	46	138	49	23	72	21	6	27	6	5	11	16	12	28	50	34	34
Congestion,	3	2	2	2	2	1	19	15	34	7	4	11	5	3	8	2	3	5	5	5	10	14	14	6
Amaurosis, partial,	1	2	2	3	.	.	12	14	26	5	8	13	2	.	2	3	3	6	3	3	5	17	5	4
Do. complete,	20	3	5	2	3	1	70	32	102	42	14	56	6	4	10	11	4	15	11	10	21	26	45	30
Atrophy of Eye,	.	.	.	.	.	.	3	2	5	.	.	.	1	1	2	.	1	1	1	1	2	1	3	1
Myopia,	1	1	.	.	.	.	5	3	8	2	.	2	.	.	.	.	.	.	3	3	6	1	2	5
Strabismus,	2	2	.	.	1	.	38	33	71	23	17	40	6	7	13	3	3	6	6	6	12	20	23	28
Lupus and Cancer,	1	.	.	.	1	1	2	2	4	.	1	1	1	1	2	1	.	1	.	.	.	2	1	1
Total Diseases of Eye,	158	128	110	77	94	56	2,100	1,966	4,066	1,089	952	2,024	406	385	791	196	205	401	415	425	840	1,315	1,325	1,426
Total Diseases of Ear,	61	31	55	33	.	.	454	329	783															
Diseases of Throat, &c.	.	.	.	.	.	.	2	2	4															
General Total.	.	.	.	.	.	.	2,556	2,297	4,853															

Diseases of the Ear Registered at St. Mark's Hospital, from 1st March, 1847, to 1st March, 1850.

Diseases.	Under 5.		5 to 10.		11 to 15.		16 to 20.		21 to 30.		31 to 40.		41 to 50.		50 and Upwards.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Males.	Fem.	General Total.
Otitis,	–	–	2	–	1	1	–	3	2	1	2	–	2	–	–	2	9	7	16
Acute Myringitis,	–	2	6	5	6	2	6	4	7	8	–	3	3	2	2	3	30	29	59
Chronic Myringitis,	2	3	8	4	6	3	11	13	18	17	33	12	16	7	13	7	107	66	173
Subacute Myringitis,	1	–	4	1	1	2	1	1	1	2	–	–	–	–	–	–	8	6	14
Syphilitic do.	–	–	–	–	–	–	–	–	2	–	1	–	–	–	–	–	3	–	3
Thickening of Membrana Tympani,	–	–	4	2	–	1	1	5	11	11	9	3	4	5	1	3	30	30	60
Vascular Membrana Tympani,	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	1	1	2
Collapsed Membrana Tympani,	–	–	1	–	–	1	–	–	–	–	–	–	–	1	–	–	1	2	3
Otorrhœa, Chronic,	14	13	19	9	6	13	8	11	5	6	10	2	3	–	5	7	70	61	131
Do. Acute,	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	1
Do. with Polypus,	1	–	–	–	5	2	1	1	4	1	2	3	–	1	–	–	13	8	21
Do. with Perforation,	–	–	–	–	–	2	–	1	6	2	1	2	2	1	1	1	10	9	19
Do. with Caries,	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	1	1	2
Inflammation of External Meatus,	–	–	–	–	–	–	–	–	–	1	–	–	1	1	–	–	1	2	3
Contraction and Ulceration do.,	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	2	2
Abscess in do.	–	1	–	–	–	–	–	–	2	1	2	1	1	–	–	–	5	3	8
Tumour in do.	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	1
Exostosis of do.	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	1
Eczema Aurium,	4	3	2	2	–	1	–	2	–	1	–	6	–	–	2	–	8	15	23
Congenital Malformation,	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	1	2
Abscess of Mastoid Gland,	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	1
Foreign body in Meatus,	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Tumour of Auricle,	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	1	1	2
Nervous Deafness,	–	–	–	–	–	–	–	–	3	4	3	–	1	1	1	1	8	6	14
Tinitus Aurium,	–	–	–	–	–	–	1	–	2	2	–	–	–	–	–	–	3	2	5
Otalgia,	–	–	1	–	–	–	–	–	2	3	1	–	–	–	1	–	5	3	8
Cerumen,	7	2	17	11	8	5	4	3	20	12	22	19	28	10	29	9	135	71	206
Deaf and Dumb,	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	2
Total,	31	25	64	34	34	35	34	45	88	75	87	53	61	31	55	33	454	329	783

Dublin: Printed by Alexander Thom, 87, Abbey-street.

FIFTH REPORT

OF

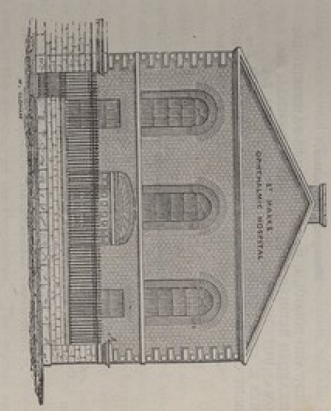
ST. MARK'S OPHTHALMIC HOSPITAL AND DISPENSARY

FOR

DISEASES OF THE EYE AND EAR,

LINCOLN-PLACE.

1850-'51.



DUBLIN:
PRINTED BY ALEXANDER THOM, 87 & 88, ABBEY-STREET.
1851.

ST. MARK'S

OPHTHALMIC HOSPITAL AND DISPENSARY

FOR

DISEASES OF THE EYE AND EAR,

FORMERLY

THE PARK-STREET SCHOOL OF MEDICINE,

LINCOLN-PLACE.

1850–'51.

Managing Committee.

SIR EDWARD BOROUGH, Bart.	CHARLES FAIRFIELD, Esq.
ALEXANDER FERRIER, Esq.	JOHN O. BONSALL, Esq.
THOMAS HUTTON, Esq.	FRANCIS CODD, Esq.
JAMES R. STEWART, Esq.	WILLIAM R. WILDE, Esq.
ROBERT CALLWELL, Esq.	WILLIAM LONGFIELD, Esq., Secretary and Treasurer.

Medical Attendants.

Surgeon, WILLIAM R. WILDE, F.R.C.S.

Consulting Physician, ROBERT J. GRAVES, M.D.

Consulting Surgeon, SIR PHILIP CRAMPTON, Bart.

Resident Assistant, Mr. THORNTON.

Cupper, Mr. MAPLESON. Optician, Mr. YEATES.

ANNUAL REPORT.

The Committee of St. Mark's Ophthalmic Hospital and Dispensary for Diseases of the Eye and Ear, in furnishing their Annual Report, congratulate the Patrons and Subscribers to the Institution upon the progress which it has made during the past year. As stated at the conclusion of the last published Report, the premises in Mark-street having been found totally inadequate to the increased demands of the public upon the Institution, it became necessary to procure some building which would afford greater accommodation, and also be situated in a more healthy locality. With this view the plot of ground and building belonging to the School of Medicine in Park-street was selected as being in every respect the most eligible. As, however, the means which the Committee had at their disposal were totally inadequate for the purchase of so extensive a concern;—as the vested money belonging to the Institution was under the control of the Commissioners of Charitable Bequests: and as moreover it was considered advisable strictly to preserve the interest of the funded property of the Institution, in order to defray the ground rent of whatever building was procured, the difficulties which presented themselves appeared at first insurmountable. Mr. Wilde has, however, at his own expense, and at a cost of nearly £1,000 not only completed the purchase of the Building, but also remodelled it for all the purposes of an hospital, and has placed it, free of all rent, at the disposal of the Committee. The ground rent of the plot is but £22 10*s*., and the concern is held by a renewable lease under the Board of Trinity College. Small renewal fines are from time to time payable to Phineas Ryall, Esq., representative of the late John Roberts, who originally

leased the premises to the proprietors of the Medical School. Owing to the improvements which have lately been made by the Honourable Sidney Herbert in Park-street,—now Lincoln-place,—that locality has become one of the most healthy in the City of Dublin. The Hospital, which is a public ornament to the Metropolis, is situated in the immediate vicinity of the School of Physic of the University, and is altogether one of the most complete Establishments of the kind in the United Kingdom.

The Hospital contains accommodation for Twenty Patients; is provided with a handsome Operating Theatre and Lecture-room; apartments for the Resident Assistant; a Surgery, and a large Dispensary, as well as Kitchens, Store-rooms, and Nurses' Apartments, &c. The Dispensary Department is approached from the rere, and is quite separate and distinct from the Hospital, so as to prevent communication between the intern and extern Patients.

The great increase of Patients at the Dispensary has rendered additional accommodation necessary, and some alterations are also proposed by which a large Waiting-room will be provided in the ground story, and three small Wards for the reception of pay Patients made out of the large room originally used as a Museum. To meet the expenses of these alterations over and above the ordinary outlay of the Hospital, the Committee are happy to say, that they have lately received through Hugh Barton, Esq., of Straffan, a Legacy of £50 under the Will of the late General Sir John Elley, K.C.B. The Hospital is likewise indebted to Major Fairfield for a donation of the front iron railing.

The Committee beg to express their approval of the judicious manner in which the Building of the late Medical School has been improved and adapted to the purposes of an Ophthalmic Hospital by the Architect, Mr. Parke Neville.

In the Bill for the "better management of Medical Charities in Ireland," at present before Parliament, St. Mark's Ophthalmic Hospital has, with certain other Hospitals in the City of Dublin, been specially exempted from the provisions of that measure. It will therefore, soon be one of the few Medical Institutions in Ireland even partially supported by voluntary contributions;

and it will be one of the six Medical Charities for which the Metropolitan Corporation are empowered to provide.

The Subscriptions during the last year have amounted to £104; and the City Grants from the late Grand Juries, to £95 5*s.* 6*d.* A further sum was allocated by the Corporation in February last, but it does not properly come into the credits for the past year. The entire income of the Establishment, including the Balance from the former year, amounts to £373 7*s.* 1*d.*; and the expenses have been £310 10*s.* 5*d.*, of which sum £97 4*s.* 6½*d.* was almost entirely expended in procuring new furniture of the best description for the Institution. The Balance at present in the Treasurer's hands, exclusive of Sir John Elley's Bequest, amounts to £62 16*s.* 8*d.* The annual audited Account together with the list of Subscribers is subjoined.

The Committee now earnestly solicit the aid of the benevolent in support of this valuable Institution, which is not only of great benefit to the poor of the country at large, but of much importance to the city as a portion of the Dublin School of Medicine. At the present time in particular, when Ophthalmia has committed such ravages in different parts of the Kingdom, and entailed such expense on the Unions where it has appeared, the Committee earnestly hope that the landed proprietors throughout the country will afford them some assistance in maintaining the Institution and increasing and diffusing its benefits. The applications for relief by the poor labouring under the effects of the Ophthalmia increase weekly, and many more cases susceptible of relief could be admitted if the means at the disposal of the Committee were greater. Patients are received from every part of the Kingdom, as well as the Metropolis, and the cases for admission are selected from among the most urgent, or those which are most likely to be relieved by a residence in Hospital for a limited period.

During the past year 97 Patients (65 Males, and 32 Females) were treated within the wards of the Hospital, and 134 Operations have been performed. Classified Tables of the Receptions and Operations are supplied at the end of this Report. In the Dispensary 1,701 Patients affected with Diseases of the Eye (851 Males, and 850 Females), and 321 Patients, labouring under Diseases of the Ear (184 Males, and 137

Females); in all, 2,022 received Medicine and Advice during the year ending the 1st March, 1851. The renewal tickets from month to month amounted to 487. Since the Institution was established 14,840 persons have been treated in the Dispensary; and from the date of the opening of the Hospital in Mark-street in 1844, to the 1st March last, 612 Patients have been received into the Wards of the Hospital.

The original Minute Book of St. Mark's Hospital has been recovered, and is at present in the possession of the Commissioners of Charitable Bequests. From that Record and other sources of information, a short history of this ancient Metropolitan Institution has been drawn up and is annexed to this Report. To it public attention is particularly requested.

The Committee, in order to save the expense of Printing, do not deem it necessary to publish the classified list of Ophthalmic Cases,—which is particularly intended for scientific purposes,—more than once in every two or three years.

The premises in Mark-street, which belong to the parish, and were occupied as an Hospital since 1844, have been given up to the Rector, and a Receipt in full obtained for all Rent due up to February last.

Major Fairfield and Francis Codd, Esq., have been added to the Managing Committee.

The Dispensary is open on the mornings of Tuesdays and Fridays from Ten o'clock until Twelve. Operations are performed at Eleven o'clock on Wednesdays. Accidents attended at all times.

Donations and Subscriptions will be thankfully received at the Banks of Messrs. La Touche & Co., and Messrs. Boyle, Low, Pim, & Co.; by the Secretary, William Longfield, Esq., 19, Harcourt-street; by the Medical Attendant, W. R. Wilde, Esq., 21, Westland-row, or by any of the Committee.

WILLIAM LONGFIELD,

Secretary.

2nd June, 1851.

LIST OF SUBSCRIPTIONS

TO

ST. MARK'S OPHTHALMIC HOSPITAL

FROM

1st MARCH, 1850, TO 1st MARCH, 1851.

	£	s.	d.
His Grace the Duke of Leinster,	1	0	0
The Right Honourable the Earl of Roden,	5	0	0
The Right Honourable the Earl of Mayo,	1	0	0
The Right Honourable the Earl of Leitrim,	1	0	0
The Viscount De Vesci,	1	0	0
Lord Bellew,	2	0	0
The Countess Dowager of Howth,	1	0	0
The Lady Florence Balfour,	0	10	0
The Most Rev. Archbishop Murray,	2	0	0
The Right Honourable the Lord Mayor of Dublin,	1	0	0
The Rev. Dr. Wall, Vice-Provost T.C.D.,	1	0	0
The Very Rev. Dean Meyler, (2 years,)	2	0	0
The Archdeacon of Glendalough,	1	0	0
Baron Pennefather,	1	0	0
The Honourable Mrs. Lawless, Lyons,	1	1	0
Mr. Justice Crampton,	1	0	0
Sir Edward Borough, Bart.,	1	1	0
Mrs. Fitzherbert, Blackcastle,	1	8	0
J. R. Corballis, Esq., Q.C.,	1	1	0
George Wills Sandford, Esq., Castlerea,	1	0	0
Hugh Barton, Esq., Straffan,	2	0	0
George Roe, Esq.,	1	0	0
Francis Codd, Esq.,	1	0	0
John Radcliff, Esq., C.B.W.,	1	0	0
Miss Murphy,	4	0	0
Mrs. John Litton,	1	0	0
Mrs. Evans, Portrane,	1	0	0
Miss Helen Faucit,	5	0	0
Mrs. Collins,	1	0	0
Mrs. Leeke,	1	0	0
Mrs. A. Raikes,	2	0	0
Miss Aldridge,	0	5	0
Charles Kean, Esq.,	5	0	0
Henry Bewley, Esq.,	5	0	0
John Hutton and Sons,	3	0	0

	£	s.	d.
Thomas Wilson, Esq.,	1	1	0
James Ferrier, Esq.,	1	0	0
Alexander Ferrier, Esq.	1	0	0
Gilbert Burns, Esq.,	1	0	0
William H. Pim, Esq.,	1	0	0
Thomas Pim, jun., Esq.,	1	0	0
James R. Stewart, Esq.,	1	0	0
Mrs. Birchall,	1	0	0
Alderman Andrews,	1	0	0
Charles Leslie, Esq.,	1	0	0
John Purser, jun., Esq.,	0	10	0
James William Cusack, M.D.,	1	1	0
William Stokes, M.D.,	1	1	0
J. M. O'Ferrall, M.D.,	1	0	0
William Burke, M.D.,	1	0	0
Francis Lynch, M.D., Loughrea,	1	0	0
George Owens, M.D.,	1	0	0
J. M'Neece, M.D., Maguire's Bridge,	1	0	0
Thomas Rothwell, Esq., Shantonagh,	1	0	0
William Edington, Esq.,	1	0	0
Henry A. Cowper, Esq.,	1	0	0
Henry Courtnay, Esq.,	1	0	0
Mrs. Vincent, (2 years,)	2	0	0
Robert Alexander, Esq., Loughbrickland,	1	0	0
Michael Powell, Esq.,	1	0	0
William Longfield, Esq.,	1	0	0
J. Wandesford, Esq., Castlecomer,	1	0	0
Alexander Thom, Esq.,	1	0	0
Mrs. Duckett, Duckett's Grove,	1	0	0
Messrs. Allen and Co.,	1	1	0
Andrew Armstrong, Esq.,	1	0	0
Patrick Brophy, Esq.,	1	0	0
Mr. William Kelly,	1	0	0
Miss M'Cracken,	1	0	0
Mr. Thomas Maguire,	1	0	0
Mr. James Toole,	1	0	0
Mrs. Farrell,	1	0	0
Mr. Thomas Kirk,	1	0	0
Mr. James Kerr,	1	0	0
Mr. John Hilbert,	1	0	0
Mr. Michael Mooney,	1	0	0
Miss M. Carroll,	1	0	0
Mrs. Molloy,	1	0	0

ST. MARK'S OPHTHALMIC HOSPITAL IN ACCOUNT WITH THE TREASURER.

From 1st March, 1850, to 1st March, 1851.

Dr. *Cr.*

	£	s.	d.		£	s.	d.
By Balance in hands, 1st March, 1850,	94	0	2	To Medicines,	42	7	3½
,, Special Hospital Fund,	29	19	6	,, Instruments,	3	4	6
,, Dispensary Patients,	50	1	11	,, Spectacles, Cataract Glasses, &c.,	3	15	10
,, Subscriptions,	104	0	0	,, Leeches,	5	0	0
,, City Grant, Easter Term, 1850,	31	7	6	,, Assistant and Copper's Salaries,	20	0	0
,, Ditto, Michaelmas do.,	63	16	0	,, Nurses, Porters, and Servants' Wages,	21	1	1
				,, Stationery, Postage, &c.,	4	13	10
				,, Furniture and Repairs,	97	4	6½
				,, Washing and Sundries,	3	8	7½
				,, Soap and Candles,	1	12	6
				,, Coals,	9	14	0
				,, Bread,	20	1	11
				,, Meat,	7	6	6
				,, Milk,	32	7	7
				,, Groceries,	1	1	3
				,, Printing,	10	0	6
				,, Rent,	15	0	0
				,, Taxes,	3	19	0
				,, Sundries,	0	19	4½
				,, Insurance,	2	15	0
				,, Collector's Fees,	2	0	0
				,, Pauper Patients leaving Hospital,	1	6	0
					310	10	5
				Balance on hands,	62	16	8
	£373	7	1		£373	7	1

I have examined above Accounts, and compared Vouchers, and find that a Balance of £62 16*s.* 8*d.* remains in Treasurer's hands.

5th March, 1851. ROBERT CALLWELL.

Patients admitted into St. Mark's Hospital from 1st March, 1850, to 1st March, 1851.

DISEASES.	Males.	Fem.	Total.
Cataract,	21	12	33
Dislocation of Lens,	5	1	6
Ophthalmitis,	1	–	1
Injuries of Eye,	6	–	6
Ophthalmia,	2	1	3
Pannus,	–	4	4
Staphyloma of Cornea,	8	1	9
Ulcer of Cornea,	6	5	11
Corneitis,	1	–	1
Choroido-iritis,	1	–	1
Syphilitic Iritis,	1	–	1
Closed Pupil,	6	1	7
Amaurosis,	2	2	4
Entropium,	–	1	1
Ectropium,	1	2	3
Prolapsed Iris,	1	1	2
Sclerotitis,	–	1	1
Synechia Anterior,	2	–	2
Otitis,	1	–	1
	65	32	97

OPERATIONS PERFORMED.	Males.	Fem.	Total.
Cataract, By Extraction,	15	9	42
Cataract, By Solution,	15	3	
Artificial Pupil,	12	–	12
Removal of Stapylomata,	2	2	4
Stabismus,	8	9	17
Entropium and Trichiasis,	1	6	7
Ectropium,	2	2	4
Removal of Tarsal Tumours,	11	9	20
Operations on Lachrymal Sac,	5	10	15
Plepharo-Plastic Operations,	3	1	4
Removal of Aural Polypi,	3	4	7
Do. Nasal,	2	–	2
Total,	78	55	134

HISTORY OF ST. MARK'S HOSPITAL.

As this Institution is now fairly established, some account of its origin and history will not only prove interesting in itself, but serve to exhibit the claim which it has upon the citizens of Dublin for support. At the early part of the last century, the Medical Charities of Dublin consisted of ;—

The Charitable Infirmary ;—on the Inns-quay, founded and endowed in 1728, by six surgeons of the city of Dublin—Messrs. George and Frederick Duany, Patrick Kelly, Nathaniel Handson, John Dowdall, and Peter Brenan. It was originally situated in Cook-street, and could accommodate but four intern patients. On being removed to the Inns-quay, the number was increased to forty. Upon the erection of the Four Courts, this institution, which was the first hospital established in Dublin, was removed to Jervis-street, where it still exists.

Steevens's Hospital ;—erected by property bequeathed for that purpose by Dr. Richard Steevens, an eminent physician in this city, and opened in 1733.

Mercer's Hospital ;—erected and endowed by Mrs. Mary Mercer, in its present locality at the end of Stephen-street, in 1734.

The Hospital for Incurables ;—established by the "Charitable Musical Society of Crow-street," in the year 1744. In 1760 it stood on Lazer's-hill, now the lower end of Townsend-street.

The Hospital for Poor Lying-in Women ;—in George's-lane, (now South Great George's-street,) erected by Dr. Bartholomew Moss, in 1745, and now the Dublin Lying-in Hospital, Rotunda, Sackville-street; the first of the kind opened in the British dominions.

St. Patrick's Hospital ;—founded by Dr. Jonathan Swift, D.S.P., for Lunatics and Idiots, opened in 1757.

The Meath Hospital ;—originally opened in Meath-street, 2nd March, 1753, for the benefit of the Poor Artisans in the Earl of Meath's Liberty.

The Lock Hospital, in George's-lane ;—(originally opened in Rainsford-street,) the first of the kind in this kingdom, likewise owed its origin to the bounty and benevolence of a medical man, having been "instituted in 1755, by Surgeon Doyle." A similar institution was founded by subscriptions, and opened in King-street, Oxmantown, in August, 1758.

The Infirmary, in James's-street, for the Sick and Wounded Soldiers of the Army ;—which existed in 1757, did not properly belong to the Medical Charities of Dublin at that period, no more than the present Royal Infirmary, in the Phœnix Park.

St. Catharine's Hospital ;—in Meath-street, for Poor Surgical Patients, opened 17th August, 1758, was afterwards incorporated with the following.

"St. Nicholas's Hospital, or the New Charitable Infirmary ;—in Francis-street, the first of the kind established in that populous part of the city, was," as we learn from the almanacs of the period, "begun in Cole-alley, Meath-street, 26th October, 1752. But that place being insufficient for the numbers daily resorting thereto, the surgeons took a large and convenient house in Francis-street, capable

of receiving forty intern surgical patients. It was opened upon the 1st April, 1753." "Regular attendance is given, both in Physic and Surgery, every morning, from 8 until 10, by Drs. Patrick Kelly, John Taaffe, and Edward Jennings, physicians; Peter Brenan, Cusick Roney, Thomas Mercer, James Dillon, and Edward Walls, surgeons;" who attended alternately without remuneration. Portions of the original building still exist, at Nos. 129 and 130 Francis-street, and in the old dilapidated houses yet remaining in Infirmary-yard behind these premises, and running parallel with Swift's-alley Church. It appears to have been established chiefly through the instrumentality of the physicians and surgeons belonging to it. It was supported by subscriptions, and the interest of a fund raised by lottery. What may have been the amount of the sum acquired by the lottery we have not at present any means of ascertaining, as the original Minute Book of the Hospital has long since been lost sight of, but we know that it was vested in "Navigation Debentures," the interest alone of which was employed for the purposes of the Hospital. In the year 1759, the Rev. Dr. John Smith bequeathed to this charity a Kinnegad Road Debenture, No. 290, for £50. This property, together with the residue of the fund raised by the lottery, still appertains to the institution.

In 1787, St. Catharine's Hospital already alluded to was united with the Charitable Infirmary, and the name of the latter changed to that of "The United Hospital of St. Nicholas and St. Catharine." As appears from the almanacs of the day, many of the most celebrated physicians and surgeons of Dublin were attached to this institution during the latter part of the last century, and "all served without fee or reward." Again, we read that "from 1st Nov., 1762, to 1st Nov., 1763, interns received into the house, 329; externs relieved, about 10,000;" whereas the Meath Hospital, which had just then been removed from Meath-street to South Earl-street, received but 130 interns, and 8,004 externs. We presume that this large amount of extern patients arose from the circumstance of the registry having been made from the daily attendance, and not the actual number of individuals who received advice during the year.

The neighbourhood of Francis-street being at that time the most populous and commercial, and to a certain extent the most riotous portion of the city, accidents were of very frequent occurrence there; and to the vast opportunities for studying disease afforded by this Hospital is mainly due the celebrity which Dublin attained as a School of Practical Surgery towards the end of the last century. It was there that the distinguished William Dease made those observations on diseases and injuries which enabled him to produce works which were not only, in point of time, the first surgical writings that emanated from Dublin, but which wrought most useful reforms in the healing art, and are still considered standard in their line. His book of "Observations on Wounds of the Head," published in 1776, was dedicated to "the Governors of the United Hospital of St. Nicholas and St. Catharine," to which he was then one of the surgeons.

At the commencement of the present century, the Meath Hospital,

which had been constituted by Act of Parliament, in the year 1774, the County of Dublin Infirmary, and which then stood in the Coombe, appears to have been sufficient for the wants of the neighbourhood; and the funds of the Hospital of St. Nicholas and St. Catharine, derived from voluntary contributions, fell off so much that it was deemed advisable by the Governors to change it to another locality. What became of the early records of the institution is not known, but there still exists "The Governors' Book of the United Hospital of St. Mark and St. Anne, commencing upon the 2nd of April, 1808," the first entry in which records a meeting of the Medical Governors of the United Hospital of St Nicholas and St. Catharine, held in the house in Francis-street upon the above date. The members present were—Messrs. Rivers, Doyle, and Hamilton, surgeons; and Drs. Burke and Adrien, physicians. This book, in which the transactions of the Hospital Committee were recorded, from the date above specified to the 4th of February, 1832, when the last entry was made, appears to have been entirely the property and solely made use of by the Medical Governors of the institution. Upon the 20th May, in the same year, at a meeting of the Medical Governors, at which, in addition to those already named, Dr. Teeling and Mr. Fitzsimon were present, it was resolved to move the Hospital to St. Mark's Parish, it being no longer necessary where it then stood; to take a lease of a house in Mark-street, for an Hospital, at a rent of £20 a-year; and to draw from the funded property of the charity a sum not exceeding £200, to be expended on the new establishment. Upon the 16th September, a meeting was held by the Medical Governors, at the New Infirmary in Mark-street, which was styled "The United Hospital of St. Mark and St. Anne." The institution was re-opened at No. 15, on the 3rd October. Upon the 5th December a Prospectus was issued, in order to raise subscriptions for the support of the institution. In this it was stated that—"On the expiration of the lease of the house in Francis-street, in the year 1804, the Medical Governors, considering that the West End of the City was amply supplied with similar institutions, richly endowed and well supported, turned their thoughts to this Parish, the only part of the Metropolis that stood in need of such an establishment. Induced by these motives, and strongly encouraged by the inhabitants of that quarter, the Governors opened the Hospital in Mark-street in October last, in a neat and suitable house taken by them, and fitted up with twelve beds, well appointed, for the reception of Medical and Surgical Patients. One Physician, four Surgeons, and an Apothecary, attend each day, from 9 until 11 o'clock, who give advice and medicine to the poor of every description. . . . The Medical Governors, influenced by no principle save that of charity, offer all this to the public, and the use of a fund of ten debentures, with their professional services, without fee or emolument."

Mr. Sweetman, of Francis-street, was the Treasurer, and had charge of the fund. During the next six years the Hospital appears to have been in a very languishing condition. Subscriptions were not forthcoming, and the chief entries in the Minute Book during that period concern the election and resignation of several Medical Officers. Some

difficulty appearing to exist with respect to the funded money of the charity, it was resolved, on the 23d June, 1815, "to elect Trustees to transfer the property of the institution from the present Treasurer, and to place it in the Bank of Ireland." The five Trustees, who were elected by ballot from among the Medical Governors, were Messrs. Callanan, Burke, Adrien, Hamilton, and Fitzsimon. But the fund was not resigned by Mr. Sweetman until the year 1822, when he consented to do so, upon the written opinion of Sergeant Lefroy. A copy of this opinion is to be found in the Minute Book already referred to. The Trustees converted the Nine Navigation Debentures, of £100 each, into Four per Cent. Government Stock. The Road Debenture not being admissible into the Bank, remained in the hands of Dr. Callanan, the Sub-Treasurer.

On the 19th October, 1824, Thomas Rumley, Esq., was elected a Surgeon and Medical Governor of the institution. Subsequently, Messrs. Brown, Hart, Harrison, Armstrong, Corbet, Brady, Tuomy, and Wall, were elected officers of the institution. With the exception of Mr. Rumley, all these officers of the institution forfeited their position, either by death, resignation, or non-attendance. The difficulties of the Hospital having increased, and the entire available fund from interest money and subscriptions not amounting to £50 per annum, a public meeting was held in June, 1829, when it was agreed to remove the institution to the small building formerly a public soup-shop adjoining the Widows' Alms-house, in Mark-street, which was taken from the Churchwardens for that purpose. In the following year, the Hospital was in danger of being closed, from the difficulty of procuring the interest money from the Treasurer and last remaining Trustee. The Medical Governors therefore sought the interference of the Commissioners of Charitable Bequests, who consented to take charge of the fund, and compelled the Treasurer to resign it into their hands. The debts of the Hospital were then cleared off, and the funded money converted into Three-and-a-Half per Cent Stock. The Minute Book of the institution (that alluded to in the foregoing Report) was obtained from Dr. Callanan, in February, 1832, by Mr. Mathews, the Secretary to the Charitable Bequests' Board, in the keeping of which body it still remains, and after that there is no record of the meetings or proceedings of the institution for several years. For a considerable period subsequent to this, the institution ceased to exist, the Hospital was closed, and the interest of the funded property in the hands of the Commissioners of Charitable Bequests was employed to liquidate several heavy debts which had accumulated upon it, partly owing to mismanagement, and partly from a defalcation on the part of the Treasurer.

In July, 1842, Mr. Rumley, in connexion with Mr. Hamilton, took the house lately occupied as an Hospital in Mark-street from the rector of the parish, re-opened the institution, and supported it for some time from their own private resources. In January, 1843, these gentlemen memorialed the Board of Charitable Donations and Bequests, "to direct the interest of the St. Mark's Hospital Fund now in their hands to be expended for the benefit of the Hospital, through any channel the Commissioners may consider eligible," and at the same

time stated that they had expended "£80 in altering and repairing the house, in the purchase of bedding, &c., for six intern patients, and in arrangements for the Dispensary," &c. Accordingly, in the February following, the Commissioners made the following order—"That the future dividends be paid to the Incumbent of St. Mark's Parish, to be by him paid over to the Medical Attendants of the institution for the time being." Since then, the half-yearly dividend upon £845 17*s.* 3*d.*, now placed in the Three-and-a-Quarter per Cent. Government Stock, and also the interest of the Kinnegad Road Debenture of £50, together amounting to £29 19*s.* 6*d.*, has been paid over regularly to the Medical Officers of the institution, through the hands of the Incumbent of the Parish, the Rev. George M'Neill.

Although most of the large Hospitals in this City, and the several Infirmaries, Poor-houses, and other institutions in Ireland which afford indoor medical relief, admitted patients labouring under affections of the organs of sight and hearing, there did not, until the commencement of the year 1844, exist in this country any special or distinct hospital for treating such diseases. The want of such an establishment, upon a scale so extensive as to afford any amount of general relief, was long felt by the poor, and generally acknowledged by the upper classes of society. The advantages afforded by such an institution can only be measured by the blessings arising from the perfection of sight and hearing. In the autumn of 1841 Mr. Wilde established a Dispensary for Diseases of the Eye and Ear in South Frederick-lane, and supported it for upwards of a twelvemonth, at the end of which time, finding the number of applicants and the consequent expenditure far greater than was originally contemplated, or what could be supported by individual exertion, he determined to try the experiment of making it contribute in part to its own support, by means of a small monthly subscription from those patients whose means enabled them to do so. Paupers have, however, at all times, received advice and medicine gratuitously. The sum paid by each patient is but Sixpence per Month, and this system of partial payments has been found to work exceedingly well. It has produced care, regularity, and attention, and induced a spirit of independence among the lower orders of society worthy of countenance and support; while the annual average sum of £50, received in this way, is in itself a sufficient guarantee to the public and the supporters of the institution, that its benefits are appreciated by the poor, numbers of whom seek its advantages from distant parts of the country. It is true that this partial system of self-support is liable to objections from persons occasionally taking advantage of it for themselves and their children, who are able to pay both for medicine and medical advice; but, on the other hand, the extreme poor reap the advantage of it, and the prescriber and vendor of medicine are alone the losers. Subsequent to this, subscriptions were solicited, and many benevolent individuals came forward to assist the institution. The medical attendance is given gratuitously.

A large majority of patients affected with diseases of the eye, and nearly all those labouring under affections of the ear, only require out-door relief; yet, as several of the most inveterate forms of blindness can

be remedied by operation only, and as many of the patients affected with such diseases, or suffering from injuries or violent inflammations, have either come from the country, or live in some of the most wretched and neglected parts of the city, where, from their poverty or the unhealthy condition of their dwellings, they could not possibly obtain those comforts which an hospital affords, it was proposed to establish a special hospital for their reception. In February, 1844, Mr. Wilde, having repaid Messrs. Hamilton and Brady (the latter being then the representative of Mr. Rumley) the sum they expended on the repairs of St. Mark's Hospital, was by them given possession of the institution, and appointed its sole Medical Attendant. A Committee of some of the most respectable citizens of Dublin, together with a Secretary and Treasurer, was then formed, in whose hands was placed the fiscal management of the institution, and a presentment was forthwith obtained from the City Grand Jury for a sum equal in amount to that subscribed for the previous half-year. Since then, the amount of subscriptions have been annually presented for, and the fund belonging to the Hospital has been regularly paid over by the Incumbent of the Parish to the Treasurer, Mr. Longfield.

In 1824 several eminent Physicians and Surgeons in Dublin erected the School of Medicine in Park-street—an establishment which soon gained an European and American celebrity, and was for many years one of the chief educational attractions of the city. In 1849 the Proprietors closed the School; and in February, 1850, they disposed of their interest in the premises to Mr. Wilde, and the Anatomical and Pathological Collection to the Government for the use of the Queen's Colleges of Cork and Belfast. No building could be better circumstanced for the purposes of an Hospital than this. It has a court-yard in front; is isolated from all surrounding houses, and stands in an enclosed plot of ground, having 61 feet frontage and measuring 95 feet in depth. As stated in the foregoing Report, it has been completely remodelled and fitted up throughout for the purposes of an Ophthalmic Hospital, thereby affording patients advantages which General Hospitals do not admit of. There is a yard to the rere, in which patients can occasionally take exercise; and being in the immediate vicinity of the College Park the institution is remarkably healthy, while the class of affections treated in it secures the inhabitants of the adjoining streets and squares of this most central and respectable part of the Metropolis from any annoyance arising from the introduction of epidemic or infectious diseases. The New Hospital contains 20 beds, and also some accommodation in private wards for the reception of a few pay patients. The money derived from these latter goes to the benefit of the institution. The subsequent history of the institution is contained in the foregoing and previous Annual Reports; and the institution being now upon a more permanent footing than it has ever stood before, it is earnestly to be hoped that the public will appreciate its usefulness, by continuing to afford it sufficient means of support.

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CONTRIBUTIONS

TO

AURAL SURGERY.

BY

W. R. WILDE, M.R.I.A.,

SURGEON TO ST. MARK'S HOSPITAL.

PART III.

INFLAMMATORY AFFECTIONS

OF THE

MEMBRANA TYMPANI AND MIDDLE EAR.

FROM THE DUBLIN QUARTERLY JOURNAL OF MEDICAL SCIENCE, NO. IX.

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&c. &c.

PART III.(a)

NOTWITHSTANDING the remarks which we daily meet with in the periodic and "manual" literature of the day,—that the treatment of diseases of the ear is an opprobium to medicine,—the progress which this branch of medical science is making is in all probability as rapid as that of the other departments of the healing art.

Among the many causes from which this opinion has arisen, there are two which must pre-eminently attract the attention of any person conversant with the subject, or who will calmly examine into the question. The first is, that heretofore the treatment of those diseases has been committed to the hands of the most uneducated quacks and char-

(a) Part I., upon the Causes and Treatment of Otorrhœa, appeared in the former Series of this Journal, for January, 1844, vol. xxiv. p. 388. This essay has been twice translated into German,—first by Dr. Von Hasselberg, of Stralsund, in 1846, and afterwards by Dr. Schmaltz, of Dresden, during the present year. Part II., upon the early History of Aural Surgery, and the Nosological Arrangement of Diseases of the Ear, appeared in that for May, 1844, vol. xxv. p. 422.

To students and those commencing the study of aural diseases, who may be familiar with the German language, I would recommend the perusal of the work of Dr. Martell Frank, "*Practische Anleitung zur Erkenntnis und Behandlung der Ohrenkrankheiten*," &c. &c., Erlangen, 1845.

latans, male and female,—persons totally unacquainted with the first rudiments of medical knowledge; the second, that medical men themselves,—most astute and practical physicians and surgeons in all other respects,—treat diseases of the ear certainly in a manner that savours of empiricism, by prescribing nostrums, of both a local and general character, which we know they would never think of using in similar forms of disease in other organs of the body. This latter cause evidently results from want of proper attention to the subject in our schools, and from the practice of prescribing at random for diseases, the diagnosis and pathology of which are unknown to practitioners themselves. To these causes may be added others that, to a certain degree, serve to bias the public mind against the treatment of aural diseases. In many cases, there is either an unconsciousness of the insidious approaches of deafness, or an unwillingness to admit even the possibility of such an occurrence; or, again, there is an apathy and indifference, to a greater or less degree, on the part of those affected with deafness, to seek advice, which is scarcely credible. Persons who, if they suffer the least inconvenience in any of their functions, or the slightest disturbance of the due exercise or healthy condition of any of the other organs of sense, would immediately apply for medical relief, and submit to any, even the most severe form of treatment, will patiently permit the sense of hearing to be greatly impaired, nay, even lost on one side, without making any effort for its restoration. When the lapse of months, and even years, have contributed to confirm and render incurable such persons, they generally respond to inquiries with regard to previous treatment,—that they did not like to be "tampering" with their ears, or, that they were told nothing could be done for them. It would in no wise conduce to the practical effect to which I hope this paper may tend, to inquire into the causes of these results; I may, however, mention, that medical men themselves have in part conduced to produce this want of faith on the part of the

patient, either by direct opinion as to the incurable nature of the disease or diseases known by the symptom of deafness, or by such futile treatment as broke down the confidence of the patient in any form of treatment for diseases of the organs of hearing. It is true that cases of what are termed "nervous deafness," that is, of defect of the hearing function of the acoustic nerve in any part of the internal ear, from paralysis or other causes,—or of those portions of the brain which preside over the functions of hearing, or give origin to, or are connected with the portio mollis of the seventh pair of nerves,—in fact, such cases as are analogous to amaurosis,—are as intractable as that disease of the eye;—yet I fear not to reiterate the assertion which I made upon a former occasion, that if the diseases of the ear were as well studied or understood by the generality of practitioners, and as early treated, as the diseases of the eye, it would be found that they were just as much within the pale of scientific treatment.

Notwithstanding that we have now several special works upon aural surgery, as well as some valuable monographs in the cyclopedias and periodicals, it is to be regretted that the modern Systems of Surgery contain but scanty information upon the subject of diseases of the ear.

The following passage from M. Druitt's well-arranged work (which is an exception to the class), is so apposite to the foregoing observations, that I insert it: "Deafness is so common and so distressing an infirmity, and when of long standing, is so incurable, that we cannot too strongly urge all medical practitioners to make themselves familiar with the treatment of diseases of the ear. They should also encourage their patients to apply to them for the relief of *slight* and *incipient* ailments in this organ, instead of allowing them to go on till they become permanently deaf, and then letting them fruitlessly seek relief from ignorant and mercenary quacks."(*a*)

(*a*) Druitt's Surgeons' Vade Mecum, p. 382.

With these preliminary remarks I beg leave to lay before my readers some observations upon the inflammatory affections of the external membrane of the tympanum. Before, however, I enter upon the description of these diseases I feel it incumbent upon me again to offer a few observations with respect to the best method of conducting an aural examination, the only true mode of arriving at an accurate diagnosis; and I shall confine my observations as much as possible to those means which are especially requisite in the diseases about to be considered. I suppose the practitioner perfectly familiar with the normal and healthy condition and appearance of the parts, particularly the membrana tympani.

METHOD OF EXAMINATION.

Passing for the present the subjective symptoms, which will best appear in the words of the patient, in the course of this paper, let us inquire into the best method of forming a diagnosis from the physical signs which are present. The patient being placed opposite to a strong, direct sun-light, with the head inclined at such an angle that the sun's rays may fall directly through a tubular speculum upon the membrana tympani, we first carefully observe the condition of the concha, external meatus, mastoid process, infrazygomatic region, and that situated immediately below the lobe of the ear; *the auricle*, its various folds, its colour, its temperature in particular, its thickness as learned by grasping its hem or helix between the fingers, and the angle which it forms posteriorly with the cranium(*a*); then

(*a*) Acquired as well as congenital malformations of this portion of the auditory apparatus are not uncommon. Among the various methods adopted to distort this beautiful acoustic instrument, so admirably formed and adapted for collecting and transmitting sound, may be enumerated the pains effectually taken by old ladies to obliterate all the folds of the external cartilage, by tying it close to the head with a tight band, and continuing this distorting process without intermission for years together.

the position, size, shape, and colour of the *external meatus*, as seen without altering the relation of the parts(*a*). The upper rim of the helix should then be grasped between the finger and thumb of one hand, and drawn upwards, backwards, and outwards, while the thumb of the other hand placed in front of the tragus, by drawing it and the integuments forward upon the zygoma, exposes the outer third or more of the auditory canal to view. The finger should then be pressed deeply and firmly upon the moveable root of the *tragus*, and backwards into the depression between it and the articulating surface of the jaw. While the finger is retained in this position the patient should be desired to open and shut the mouth, and the amount of pain or inconvenience experienced by the pressure in those two different positions of the jaw accurately noted. The middle and fore-fingers should likewise be inserted deeply behind the ramus of the jaw towards the styloid process, and notice taken of the sensations there experienced.

The *mastoid process* in an especial manner claims our attention, where we have reason to believe inflammatory action exists. Its colour, size, shape, temperature, may be learned by even a cursory examination; but, besides this, it should be most carefully pressed upon with a couple of fingers, with a much greater degree of force and firmness than is usual in making examinations of the like nature elsewhere; and not only should this examination be applied to the mastoid region, but to the whole posterior and lateral portion of the head, if we have reason to suspect any inflammation, or its effects. The insertion of the sterno-mastoid(*b*), as well as the upper

(*a*) Without any recent or manifest disease the external meatus may, instead of presenting an irregular ellipsoid, be converted into a mere slit by the pressure of the tragus backwards, or it may be preternaturally dilated, or we may find it affected by stricture.

(*b*) There is a small gland, in shape and size like a horse bean, situated immediately behind the auricle, over the middle of the mastoid process, which

third of that muscle, should also be carefully examined in the same way. If the integuments and soft parts are swollen or œdematous, as is frequently the case in certain inflammatory affections of the ear, as also where they have become thickened from long-continued disease, it will require a considerable degree of force to make a perfectly satisfactory examination. The amount of pitting made by the finger during this examination, and its degree of permanency, are also circumstances of value in the formation of a diagnosis. Percussion of the mastoid process, immediately behind the attachment of the auricle, occasionally affords some information, as will be shewn in some of the cases hereafter to be detailed.

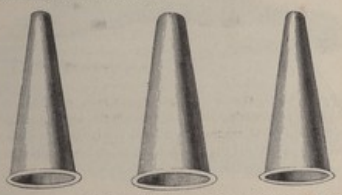
We next proceed to inquire into the condition of the *auditory canal*, and external surface of the membrana tympani. To effect this, and to explore every portion of the surface of these parts, it is necessary to resort to the mechanical assistance of the speculum(*a*), first taking care to remove any im-

frequently becomes enlarged during the progress of aural inflammations. It is also the seat of violent neuralgic pain in some instances.

(*a*) From a long and most extensive use of the tubular speculum, which I was the first to introduce into this country (see Essay upon Otorrhœa), I am convinced that it is not only the simplest, but also the most effectual instrument for examining the condition of the membrane of the tympanum and the external auditory canal. Various instruments constructed with divaricating arms, tubes with prisms, and divers lamps, have been recently invented, and their virtues set forth in graphic terms by their inventors and supporters, but they are all comparative failures, and for the following reasons: divaricating instruments cannot enlarge the osseo-cartilaginous portion of the canal near the tympanum; the prisms are totally unnecessary, and even disadvantageous where direct light can be procured. The various lamps possess these two radical defects: the light which they transmit throws a peculiar lurid glare upon the entire of the parts which they illuminate; and although an irregularity of surface, a polypus, an aperture in the membrana tympani, or the like, may indeed be detected, yet shades of colour, vascularity produced by inflammation or congestion, slight opacities, minute points of morbid deposit, and slight ulcerated abrasions, want of polish, and loss of transparency, &c., cannot be detected by their means. Again, although we

paction of wax, accumulated discharge, or other mechanical impediment which may exist and obstruct our vision. If this obstruction is complete, and that we have reason to suppose that it is the chief cause of deafness, the employment of a syringe and some plain warm water is the best mode of removing it; but if the obstruction merely co-exists with other, and particularly some of the inflammatory affections of the meatus or tympanal membrane, or if it be only partial, and consists of

were able to detect an ulcer, a granulation, or a perforation, we are not able, while the eye is fixed upon the spot, to apply any direct remedy to the parts affected,—to pass down a porte-caustic, a forceps, a snare, or a camel-hair brush, &c., through this lamp. How, for instance, could a hair, no uncommon cause of annoyance, be removed off the surface of the drum but through one of these tubes? No obstetric practitioner thinks of examining the os uteri or the surface of the vagina with a lamp, so long as the sun's rays can be directed through a tubular speculum to the parts affected. The accompanying illustration exhibits the forms of specula which I still find to answer every useful purpose.

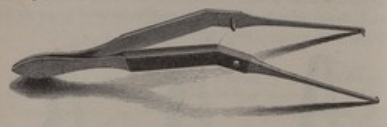


It is unnecessary to blacken the interior of the speculum, and the shorter it is made the more easy will it be found to employ instruments upon the membrane of the tympanum, or the lower portion of the passage, through it. By means of these tubes, employed, as I have directed in my former essay, with bright direct sun-light, every portion of the meatus and the membrane of the drum may be as clearly and accurately investigated as the surface of the eye. There are cases, however, in which a lamp may be employed: they are those in which it is imperatively necessary to examine the ear on a very dark day or at night. It is of great consequence that, in

portions of detached cuticle, hairs, or scales of hardened, inspissated cerumen, it is better to remove these gently with a pair of fine forceps(*a*), because the very act of syringing, even with warm water, causes in a healthy ear an increased vascularity, which will in a diseased ear mask the actual amount of disease present. The same observation applies also with respect to slight otorrhœa, but if there be much discharge present we must have recourse to the syringe. The form, curvature, colour,

making these examinations, the shadow of the operator's head should not fall within the sphere of the speculum. It should be a little above or a little below it, according to the sun's elevation at the moment.

(*a*) Having found that the handles of the instruments introduced through the tubular speculum and the fingers of the operator interfere to a certain degree with the direct sun rays, I have latterly had instruments constructed with an angle in the shaft, as shewn in the accompanying view of a pair of ear forceps,



the utility of which is at once manifest. In the same way I have improved upon the snare for removing polypi, as shewn in the accompanying cut. In making this instrument, the loops at the side and the holes at the top should be made very smooth and their edges bevilled off, so that the wire will not scrape or cut in running through them.

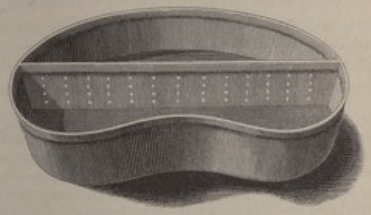
All ear instruments should be constructed upon a like principle.

For syringing the ear I have found the form of vessels represented on the other side very useful: it is six inches long, four broad, and two deep; its

polish, vascularity, and the secretion of the entire auditory canal, should be accurately observed.

Having brought the whole of the auditory canal and the entire of the *membrana tympani* under our view, we must take accurate note of their colour and relative positions. The tympanal membrane, in an especial manner, claims our attention; not only its *superficial colour*, but its degree of *transparency* or *opacity*, its *tenuity* and *thickening*, its *vascularity*, and the *arrangement and position of its vessels* in every part,—its *tension*, *flexibility*, *polish*, *curvature*, and the position both to the interior of the cavity of which it forms the outward boundary, and also to the handle of the malleus, both above and below the attachment of this bone, should be carefully observed(*a*). While the membrane is thus within the field of the speculum, the patient

concave part fits accurately the curve beneath the lobe of the ear; and the perforated septum strains the clean water from the dirty.



Simple as the operation of syringing appears, it requires some caution and dexterity in its performance.—While the patient holds up the pan, the helix of the auricle should be grasped with the left hand, so as to straighten the auditory canal, and then a proper brass syringe, with a pair of large loops attached to its upper extremity, through which the fore and middle fingers of the right hand are passed, injects a steady stream of water, by the thumb working the piston. In some persons the act of syringing, and in others the mere introduction of a speculum, induces violent paroxysms of coughing.

(*a*) The membrane of the tympanum is, as I have already stated, not

should be desired to try and press air into the drum by holding the nose, shutting the mouth, and making a forced expiration(*a*). This manœuvre should be resorted to several times, if the first be ineffectual, as some degree of tact on the part of the patient is necessary to test the experiment. While the air is thus pressed into the drum we should note accurately whether the membrane vibrates, or its tensity is altered, and if so, whether it regains its original position suddenly or gradually. The patient's own sensations should likewise be taken into account in this matter. It is also especially necessary carefully to observe the degree of vascularity produced by this inflation, as well as the course and position of the vessels which cause such vascularity(*b*), and if a small aperture exist in the membrane which may have escaped the eye, we may then readily detect it both by sight and hearing. By this means we often detect a small perforation in the membrane, which, from its minuteness, or owing to the part being thickened or coated with discharge, had previously escaped our first mere ocular inspection. If such exist, we shall then see its open everted lips sometimes pressing out mucous discharge, and also hear a peculiar whistling sound, which the air makes in passing through this narrow

what it is described in anatomical works, concave on its outer aspect, but presents in the normal condition a number of curves, the most prominent, however, of which is that presented by its inferior and anterior portion, below the attachment of the malleus, which is a *decided prominent convexity*, as may be seen, not by inspection of the dead subject or an anatomical preparation, but by examining the parts in a living, healthy ear. Any deviation from this condition is the result of disease, and attended with more or less impairment of hearing, as the alteration in the curves of the media of the eye are attended with certain peculiarities of sight, as I have already explained in my second contribution to aural surgery, p. 431. See also the Dublin Dissector, fifth edition, p. 673. The normal colour and consistence of this membranous septum is very like that of fine gold-beaters' skin.

(*a*) The sound thus produced very much resembles that of a dried bladder suddenly inflated into air.

(*b*) In several healthy ears, if this experiment is made two or three times, we seldom fail to recognise one or two vessels becoming filled with red blood along the course of the malleus.

aperture. There are some cases of perforate membrana tympani, where, from obstruction in the upper part of the Eustachian tube, or granulations in the middle ear, this cannot be effected. If the patient be able to inflate the tympanum by this method, we may then remove the speculum, and, applying our own ear, either directly or through the intervention of a stethoscope, over the external auditory passage, the same method of inflation should be again had recourse to, and the peculiarity of sound which is thus produced in the middle ear, whether the ordinary normal rush of the air into the tympanum, or a prolonged squeeling or gurgling sound, such as might be produced by any contraction in or thickening of the walls of the Eustachian tube, or by dryness, or by accumulation of mucus in it or in the cavity of the tympanum, is heard. The stethoscope should also be applied over the mastoid process, and the same series of observations made upon the sounds, if any, produced there.

If the patient be unable to inflate the tympanum, and that we have reason to suspect some obstruction of the *Eustachian tube*, or an accumulation of mucus, blood, pus, or other matter, in the tympanum, we may then, should the case require it, proceed to inject air, by the mechanical means of a catheter and pump, through the Eustachian tube(*a*) into the cavity of the tympanum, while we carefully note the result by means of a stethoscope, or the ear applied externally. It must, however, be particularly borne in mind, that if the patient is labouring at the time under acute inflammation of the drum or its membranes, or the lining of the Eustachian tube, the catheter is not only inapplicable, but highly injurious. The effort of coughing, sneezing, blowing the nose, and deglutition, in causing or increasing pain, is also to be particularly attended to.

There are two methods of examining the ear, on which, from their frequency in this country, I am induced to make

(*a*) I have latterly found it very seldom necessary to resort to this operation, as the cases in which it is applicable are of much greater rarity than is usually supposed, or as the works of aurists would lead us to believe.

some remarks, in the hope of putting a stop to practices not only useless, but in some cases highly injurious. I allude to the common resort of syringing, and also of probing the ears indiscriminately, and without proper inspection of the parts. The former is of daily occurrence. A patient labouring under deafness, or, what perhaps is worse, violent pain in the ear, is examined either with the unassisted eye, or by means of some of the old divaricating specula, most probably in a badly-lighted apartment,—at all events, without the membrana tympani being brought into view, a dark cavity being all that the explorer has been able to perceive,—it is deemed advisable to try what might come out by squirting hot water into this dark passage for the ensuing quarter of an hour; but, nothing satisfactory following this operation, the diagnosis that there is no wax in the ear is accordingly made. Now, there may be a collection of cerumen, which may not be got rid of by this operation; while, if the cause of the pain or deafness is owing to an inflammatory condition of the auditory canal and its membranous extremity, a decided increase of the symptoms is produced by this unnecessary and cruel proceeding. Again, I have frequently seen inflammation produced by unnecessarily syringing an ear where no wax was present.

The practice of exploring an ear by means of a probe I cannot too strongly condemn, and yet that it is frequently resorted to surgeons are well aware. To introduce a probe down to the membrana tympani, without having that membrane fairly within view, and without a speculum being passed down to it, but merely for the purpose of satisfying the examiner as to whether the membrane is perforate or not, is, I think, a most unjustifiable proceeding.

The degree of *deafness* may be measured by holding an ordinary watch near the external meatus, and the distance at which the tickings can be accurately counted, and at which the patient is conscious of an interval between these sounds should be recorded. To effect this properly the watch should be approached gradually to the ear till it gets within the hearing

distance, and again applied directly to the auricle, and gradually removed to some distance. It is absolutely necessary, if we wish to watch the progress of a case, not only to make these observations with great care, but also to make a written note of the *hearing distance* the first and each subsequent time we see the patient(*a*). By this means we have the most satisfactory report of the progress of the case, both to ourselves and the patient. We should also test the hearing with the mouth open as well as shut. This test of the hearing distance should be tried both before and after the inflation of the tympanum, as in many cases that act will produce a very material difference in the amount of hearing. The watch should next be applied both behind and in front of the auricle, and to the forehead, and also placed gently between the teeth of the patient, and the amount of hearing thus obtained likewise noted.

The state of the *throat*, the arches of the palate, uvula, tonsils, and back of the pharynx, should next be inquired into, particularly as regards the state of the mucous membrane, its colour and degree of relaxation. So also with that of the nose. The fore-finger should then be introduced far into the mouth, and its point made to press firmly upwards and outwards against the arch of the palate, opposite the mouth of the Eustachian tube, and notice taken of the degree of pain or inconvenience it produces in the middle ear.

I have thus described the routine of examination that will be found most practically useful. Having proceeded thus far we may inquire into the history of the case, its duration, pro-

(*a*) Various instruments, producing a ticking sound by means of clock-work, have been invented, by Schmalz and others, for this purpose, but the watch is quite sufficient. It must be remembered that there is almost as great a difference in the normal hearing distance as there is in the seeing distance, even among persons who have never laboured under any disease of the ear, and who are not at all conscious of any defect of hearing.

The degree of hearing with a watch is sometimes deceptive; some patients who cannot hear a watch or even a clock, will hear the voice, even in a low tone; but these are the exceptions to the rule.

bable cause, and subjective symptoms, the pain, noise, &c., in the usual manner in which we would proceed to examine any other medical or surgical case. There are, however, two inquiries which should be particularly made: first, as to the probable hereditary nature of the complaint; and, secondly, as to the existence of *tinnitus aurium;* and, if such be present, what are the peculiar characters of it; how many kinds of noises are experienced; whether they are permanent or intermitting; under what circumstances they are decreased or diminished; and, above all, whether the patient refers them to the ears or the interior of the head; and whether one or both ears are equally affected by them.

While inquiring into the amount of deafness, and the circumstances under which the hearing is increased or diminished, we should learn whether it be improved or not when the patient is exposed to loud noises, as when standing in a mill, walking through a crowded street, or travelling in a carriage, &c. The general health of the patient, the performance of all his functions, and the endeavour to ascertain how much of the disease is purely local, or dependent upon some constitutional affection, will, no doubt, occupy the attention of an educated physician or surgeon, so that it is unnecessary here to call special attention to these circumstances.

In the foregoing remarks, which are chiefly intended as a guide to those who may be inclined to study aural diseases, I have confined them as much as possible to such as were applicable to the formation of a diagnosis in the inflammatory diseases of the ear or their results.

AUTHORITIES.

To review all the opinions of authors in a communication intended solely for practical purposes, and for the readers of a periodical, would savour more of the System or the Cyclopedia than the occasion demands, or our space permits. Let the following references, therefore, suffice.

Myringitis, or inflammation of the membrana tympani, has not been recognised or described by authors until within the last few years: and its varieties, with their peculiar symptoms, are by no means accurately understood. Itard, one of the earliest and most esteemed writers upon aural surgery, has not mentioned it, though the symptoms of at least one form of the disease are enumerated by him under the head of internal otitis(*a*). The old divisions of inflammation of the ear into otitis externa and interna do not in any way assist either our diagnosis or improve our treatment of these diseases. The same may be said of the divisions into acute and chronic. The otorrhœa, which follows in such cases, and which formed, with many writers, grounds for nosological arrangement, being but a symptom, like leucorrhœa in the female, is an insufficient ground of diagnosis.

Lincke, whose work is well worthy of being translated into English, classes the aural inflammations according to their causes, as the erysipelatous, scrofulous, syphilitic, rheumatic, catarrhal, morbillose, variolous, scarlatinous, &c., &c.; but the exact locality or seat of the original inflammation, or the peculiarity of the appearance of such, is not specified. These are merely enumerations of diseased actions, generally characterized by muco-purulent discharge, attendant on, or following these different affections. The Leipzig physician, however, was one of the first accurate describers of the "*Entzündung des Trommelfells,*" the true Myringitis(*b*).

Kramer devotes a chapter to the consideration of acute inflammation of the membrana tympani, but upon a careful perusal of it we find about three pages devoted to the description of that disease, while the remainder is occupied with the consideration of polypus, and a detail of the various methods recommended for performing perforation(*c*).

(*a*) *Traité des Maladies de l'Oreille et de l'Audition.* Deuxieme edition. Paris, 1842.

(*b*) *Handbuch der theoretischen und praktischen Ohrenheilkunde.* Leipzig, 1837.

(*c*) The Nature and Treatment of Diseases of the Ear, translated by

Mr. Pilcher disposes of the inflammation of the membrana tympani in a few pages, but enumerates most of the symptoms of the affection (except the minute appearances of the membrane), under the head of otitis interna(*a*).

Mr. J. W. Jones, in the article "Ear and Hearing, Diseases of," in the Cyclopedia of Practical Surgery, has given a short description of one form of the disease. I cannot, however, agree with him, that in "otitis interna morbid changes occur in the membrana tympani only when it is threatened with bursting by the matter accumulated in the cavity of the tympanum, and has also become involved in the inflammatory action." On the contrary, my experience leads me to believe that inflammation of the middle ear always, and at the very commencement, is shewn by the appearance of the membrana tympani; and this observation must remain undisputed until a sufficient number of accurate examinations shall have been made, in the commencement of cases of otitis interna, to negative it. I may affirm the same of ear-ache, otalgia, neuralgia of the ear, &c.; but of this hereafter.

It is quite plain from Dr. Williams's account of the "inflammation and ulceration of this membrane," that he never *examined* the membrane in this condition. Indeed, I doubt if he ever *saw* the disease under consideration(*b*).

Dr. Copland, in his compilation of aural affections, has quoted the best authors on this subject, and may be consulted with benefit(*c*).

Dr. Martell Frank has lately given a concise but faithful description of both the acute and chronic form of the disease(*d*).

Dr. J. R. Bennett. London, 1837. See also his recent work, *Beitrage zur Ohrenheilkunde*. Berlin, 1847. I shall refer to this latter farther on.

(*a*) A Treatise on the Structure, Economy, and Diseases of the Ear. London, 1838.

(*b*) Treatise on the Ear, including its Anatomy, Physiology, and Pathology. London, 1840.

(*c*) Dictionary of Practical Medicine, &c.—Articles, Ear and Hearing. Parts III. and IV.

(*d*) Already quoted at note, p. 382.

M. Hubert-Valleroux does not even enumerate the inflammation of the membrana tympani in his catalogue of aural diseases(*a*).

Schmalz has done little more than glance at the disease. He has evidently mixed up the description of its symptoms with those of other inflammatory affections of the ear(*b*).

I have connected, in the heading of this communication, the inflammations of the membrane of the tympanum with those of the middle ear, because I do not believe it possible for one to exist independent of the other for any length of time, no more than an ophthalmia can be circumscribed: or than we can by the term iritis define simple uncomplicated inflammation of the membraneous diaphragm of the ocular chamber.

When I first commenced the study of aural diseases, I believed that the deafness and tinnitus, in most cases where I had no positive evidence of disease in the meatus or membrana tympani, was caused by some defect in the nerve of hearing, or what is termed "nervous deafness." As, however, my field of observation extended, and as my knowledge of the healthy appearance of the membrane improved, I gradually began to find that the instances of deafness with *perfectly healthy* tympanal membranes which fell under my observation were comparatively few, while I became daily familiarized with a variety of pathological appearances in these structures, which I am now fully convinced are the result of different forms of inflammation of an acute or chronic nature, arising from some idiopathic or specific cause. These appearances have naturally led me to pay particular attention to those diseases in their early stages, the only period in which, in most of them, art can be of any avail(*c*). These appearances I shall endeavour to describe in the following essay.

(*a*) *Essai Theorique et Pratique sur les Maladies de l'Orielle.* Paris, 1846.

(*b*) *Erfahrungen über die Krankheiten des Gehöres und ihre Heilung.* Leipzig, 846.

(*c*) If we examine the inmates of a blind asylum we are at once struck

Mr. Toynbee, in his very valuable contributions to the morbid anatomy of the ear, published in the Medico-Chirurgical Transactions, has shewn the frequency of lesions of the middle ear, the result, no doubt, of inflammatory action; it is, however, to be regretted that the symptoms exhibited during life by the persons from whom his preparations were taken have not been recorded(*a*).

Dr. Kramer, in his late work, *Beitrage zur Ohrenheilkunde*, has given an extensive statistical table of diseases of the ear. The number of cases which he has recorded amounts to 2000, but of this number it must be remembered that 208, or one-seventh of the whole, were diseases of the auricle and external auditory passage. He includes all the diseases of the tympanal membrane with those of the external ear, whereas in my opinion they belong equally, if not more so, to those of the middle ear; indeed I believe that the chronic as well as the acute inflammation of the membrane is accompanied by disease in the middle ear more frequently than disease in the auditory passage. Of the 2000 cases observed, the inflammations of the tympanal membrane amounted to 442, or something less than one-fourth of the whole. Of these cases 45 were acute, and 397 chronic inflammations. About one-twelfth of the whole, or 164 were inflammations of the middle ear, but which he does not tell us were originally connected with, or subsequently produced changes in, the tympanal membrane. If in these 164 cases the inflammation of the mucous membrane of the middle ear was confined to that lining the bony parietes of this cavity: not extending over the extensive surface stretched over the back of the membrana tympani, not propagating inflammatory action there,

with the fact that nine-tenths of the cases of loss of vision there presented are the result of inflammatory action; the cases of pure unmixed amaurosis are comparatively rare, either on account of their actual scarcity, or because the patients so affected have already been carried off by the cerebral disease which was the original cause of their blindness.

(*a*) Med. Chir. Trans., vols. vi. and viii., second series.

and producing the effects of inflammation upon transparent or diaphanous membranes, as we see it does upon the aqueous membrane lining the back of the cornea, then have we no analogy for such a state of things in any of the other departments of pathology? To these 164 cases of inflammation of the lining of the tympanum, he has added thirty of alterations in the Eustachian tube, and four of inflammation of the periosteum; in all, 198, or one-tenth of the whole. Among the diseases of the ear he has included 46 instances of deaf-dumbness. With most of these statistics we find no fault; and to the various tables exhibiting the causes, ages, sexes, &c., we must, in common with all who will examine them, award to the zeal and industry of their author the amount of credit which they deserve.

When, however, we come to examine into the chief cause of deafness enumerated by the Berlin aurist, we at once perceive that his favourite theory of "nervous deafness" has been pressed into the service, and this item made to exhibit a magnitude which we have strong hopes of seeing Dr. Kramer himself one day criticise with more severity than we are now willing to do for him. Of the entire number of cases recorded, 1028, or somewhat more than one-half of the whole, are set down as "*Nervöse Taubheit.*" It would occupy more space than we are able to devote to this portion of the subject, to enter at any length into a discussion calculated to shew the fallacy of the reasoning adduced by the author to satisfy his readers that these were absolute cases of nervous deafness. The most that can be said of these 1028 cases, many of which must, we doubt not, have been caused by affections of the auditory nerve, is, that in these the parts capable of inspection exhibited no symptoms of disease. In which case, he says, "the use of the ear-catheter is the only means, either by blowing through it, or by injecting compressed air from the air-press, or by the introduction of a catgut string, or a small whalebone, or ivory probe, to learn the condition of the Eustachian tube and the cavity of the tympanum, and thereby, in the cases in question, to judge of the

condition of the auditory nerve,"—p. 26. But even this hazardous mode of making an examination,—by introducing a foreign substance into the cavity of the tympanum!—is at best but a negative proof. By it the condition of the ossicula, the membranes of the fenestra ovalis and the foramen rotundum, the fine mucous membrane, with its nerves, lining the tympanic cavity, the state of the labyrinth and the internal ear, or the brain, *cannot be investigated*(*a*). Is there any other organ of sense in which the affection of the nerve bears the same proportion to all the other diseases of the part as this?—would any table of the affections of the eye be acknowledged as authentic, in which more than one-half of the diseases of that organ were ascribed to amaurosis, or amaurosis not consequent upon some inflammatory condition?

The accompanying table of 708 cases of aural disease, registered at St. Mark's Hospital during the last three years, although, no doubt, liable to the defects under which the investigation of these diseases still labour, gives, without going too minutely into the subject, a tolerably good idea of the proportion of the inflammatory to the other diseases of the ear, most common among the lower orders of Dublin.

The details of this table are to be found in the annual reports of the institution. During the year 1834-35, I was not as intimately acquainted with the pathological appearances of inflammatory action as I am at present. In the tables published for that year, the cases set down to nervous deafness amounted to thirty-two out of 184; but from the subsequent tables, and more careful examinations, I am inclined to think that the number of cases registered under this head for that period were exaggerated.

(*a*) I have heard of cases in which the middle ear has been said to be explored by such mechanical means, even in this country, and I have been shewn steel sounds manufactured for the purpose. Such instruments are, however, with the exception of the tearing and inflammation which they may cause in the nasal extremity of the Eustachian tube, perfectly harmless, for they could not by any possibility, even in the dead subject, be passed through the upper end of the Eustachian tube. The only instrument I ever venture to pass into the drum is a fine ivory bougie, rendered flexible by having its earthy material extracted by means of an acid. In employing this instrument, a large-sized catheter should first be passed into the bell-mouth of the Eustachian tube, and the bougie, with about half an inch of its extremity previously softened by immersion in warm water, should then be introduced through the catheter and passed up with great gentleness and caution through the Eustachian tube into the middle ear.

DISEASES.	AGES AND SEXES.										
	Under 5		6 to 15		16 to 30		31 and up.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Gen. Tot.
Otitis,	3	1	9	3	8	6	9	8	29	18	47
Acute Myringitis,	..	2	4	5	10	9	4	5	18	21	39
Chronic Myringitis,	..	1	8	6	15	15	20	17	43	39	82
Abscess in Mem. Ty.,	..	..	1	..	..	..	1	..	2	..	2
Granular Mem. Ty.,	..	..	..	..	1	1	2	1	3	2	5
Collapse of do.,	..	..	1	1	1	1	1	5	3	7	10
Otorrhœa,	13	8	39	38	31	37	10	9	93	92	185
Do. with Polypus,	..	..	7	5	6	3	2	1	15	9	24
Do. with Perforation,	..	..	1	..	1	1	..	1	2	2	4
Nervous Deafness,	..	1	9	4	11	14	34	21	54	40	94
Tinnitus Aurium,	..	..	..	..	1	7	2	4	3	11	14
Otalgia,	..	..	..	..	1	1	1	1	2	2	4
Hæmorrhage from Ear	..	..	..	..	1	..	..	..	1	..	1
Deafness from Cerumen,	1	2	8	8	14	12	73	43	96	65	161
Chron. Infl. of Exter. Meatus,	..	..	2	1	4	3	..	3	6	7	13
Contraction and Ulceration of do.	..	..	1	..	..	..	..	..	1	..	1
Eczema of Auricle and Meatus,	3	1	2	1	1	2	..	5	6	9	15
Congenital Malformation,	..	..	..	..	1	..	..	..	1	..	1
Deafness from Disease of Throat,	..	..	2	1	..	1	1	1	3	3	6
	20	16	94	73	107	113	160	125	381	327	708

The foregoing Table does not include all the diseases enumerated in my nosology, but for the purposes intended too minute a division would be disadvantageous. From this Table the proportion of cases of nervous deafness to those the result of inflammatory action are but 1 in 5, to speak in round numbers.

I have become acquainted with the following forms of inflammation of the membrana tympani:—

I. Acute inflammation of the membrana tympani, accompanied by inflammation of the cavity of the tympanum; frequently of a rheumatic character.

II. Subacute inflammation, unaccompanied by pain.

III. Chronic inflammation, with or without inflammation of the tympanum.

IV. Strumous inflammation.

V. Syphilitic inflammation.

VI. Febrile subacute inflammation, accompanying the exanthemata and other fevers; generally producing otorrhœa (already described in Part I.)

I. ACUTE MYRINGITIS.—HISTORY AND SYMPTOMS.

In *acute inflammation* of the membrana tympani, the vascularity is generally seated in the true, fibrous membrane of that structure, and is usually the result of cold, and often attributed to rheumatic diathesis: sudden exposure to a low temperature, blasts of harsh cold wind, diving in the sea, foreign bodies, and irritating substances introduced into the external ear, &c. The auditory canal, and sometimes even the auricle, is engaged; and although we are not able to observe the precise pathological condition of the cavity of the middle ear, or its investing membrane, there can be little doubt but these parts, sooner or later, participate in the general inflammatory action. As, however, we denominate that form of internal ophthalmia which chiefly or primarily attacks the iris, an iritis, although in the severer forms of that affection, several if not all, the other textures of the eye eventually become engaged, so in inflammations of the membrana tympani, to which the term myringitis is applicable, we must expect that sooner or later the adjoining structures,—the mucous membrane lining the tympanum, with its numerous nerves, the nerves themselves which cross this cavity, the mastoid cells, the investitures of the Eustachian tube, the membrane of the fenestra ovalis and fenestra cochleæ, the muscles, ligaments, and other connexions of the ossicula,

the labyrinth, the internal ear, and the auditory nerve itself,—must sooner or later participate in the unhealthy action going forward; and must, either directly by the inflammatory lesion, or its subsequent effects, serve to impair hearing, and cause organic changes in this delicate organ. But in addition to the changes analogous to those which occur in ophthalmic inflammations, we have here, from the peculiar anatomical structure of the ear, superadded an extension of disease to parts which not only destroy the sense of hearing but prove dangerous to life, as when the periosteum, the bone, and even the membranes of the brain, or the encephalon itself, become engaged. The dermal structure of the membrana tympani also partakes of the abnormal action, and, together with that of the auditory canal, pours out a muco-purulent secretion, or even pus itself,—is occasionally raised into vesicles, becomes the seat of pustules, ulcerates, throws out granulations, and becomes thickened, &c., during the progress of this disease. The true fibrous membrane passes through all the pathological changes to which such structures are liable from inflammatory action or its results; and although the precise anatomical condition of the two may not be analogous, yet the diseases of the cornea and of the membrana tympani bear a remarkable analogy, particularly in the subsequent appearances of vascularity, thickening, opacity, morbid deposits, &c., which they present, together with adhesions by bands of membrane to the parts within the chambers, to which they form the external boundaries;—while inflammation of the lining of the meatus auditorius, the auricle itself, and the periosteum of the cranium adjoining, particularly over the mastoid process, is a very formidable and by no means uncommon symptom.

The following are generally the order of symptoms. A seizure of sudden and intense *pain* in the ear itself, generally, first appearing at night, and attended with nocturnal exacerbations during the progress of the disease. This pain is of a most excruciating kind, producing at times delirium, and

is usually likened to that of a sharp instrument penetrating through the ear to the brain: this pain, especially when the cavity of the tympanum is injured, is increased by coughing, sneezing, chewing, or swallowing, or by pressing upon the tragus, particularly when the jaw is open. The beating of the carotid is distinctly felt in the ear, and each throb of the artery, particularly if the circulation be excited, increases the suffering. There is also a feeling of fulness, and bursting within the organ frequently; with this, there is pain and soreness over the side of the head, in the teeth, in the eye and temple, and in the superior lateral triangle of the neck; with occasionally stiffness and soreness of the upper portion of the mastoid muscle, and often flying, rheumatic pains throughout the body, particularly in middle-aged persons, and those who have previously suffered from rheumatic attacks. If neglected, or unrelieved by treatment, the pain extends to the throat and mastoid region, and is increased on pressing the mouth of the Eustachian tube with the finger. The severity of the pain experienced is to a certain degree a test of the extent of the inflammation; and the peculiarity of the pain is also a means of judging of the exact seat of the inflammation. If pain is experienced in swallowing, mastication, or sneezing, &c., we may presume that the inflammation has extended to the middle ear.

A very curious impression exists among, and is too frequently acted on by the profession, that ear-ache is a *neuralgic* affection. To this very general mistake must we attribute the practice, so frequently and empirically resorted to, of pouring into the ear the various nostrums, sedatives, and stimulants, calculated to allay pain in external parts. So rare is true neuralgia of the ear, that Dr. Kramer says, he "never observed ear-ache without evidence of inflammation either of the meatus or of the membrana tympani;" although I am not prepared to say that such an affection does not occasionally exist, I must say that I cannot, at this moment, tax my memory with a single instance

of so-called "nervous otalgia," for which I have been consulted, that upon a careful examination I could not discover some direct *visible* cause for it: and I must, therefore, with Dr. Kramer, "deny to those persons the right of pronouncing a decisive opinion on the existence of a nervous otalgia, who do not understand investigating the membrana tympani in bright sunshine, and with the aid of the speculum, and who are not in the habit of doing it."(*a*)

Usually coincident with the seizure of pain, the patient complains of *tinnitus aurium*, and the noises to which this symptom is compared are as various, and the accounts given of them even more incongruous, than those of muscæ in the eye, to which, in some instances, they bear an analogy. These consist of a dull throbbing, or pulsation,—a loud pumping like that of a steam-engine,—with the occasional supervention of a noise, varying in loudness and intensity from the ticking of a watch to the striking of a loud clock; but the most usual simile given by patients in describing those ear-noises is that tidal sound perceived on holding a conch-shell to the ear. In the severer forms of aural inflammation, patients very frequently liken this unpleasant symptom to the falling of water, the dashing of a cataract, or that peculiar rushing sound produced by the sudden escape of water through a large pipe or sluice-gate. In the more mitigated forms, and the more advanced and chronic stages of these aural inflammations, we generally find the sounds of a hissing or blowing character, and usually likened to the singing of a kettle, the noise of a distant storm, the fluttering of the leaves of trees, the chirruping of birds, the distant ringing of bells, a dull cooing in the ear, musical sounds of various kinds, the buzzing of bees, blowing of a bellows, whistling, and other noises of a similar character, for which the fer-

(*a*) Not long ago, a practitioner, relating to me the history of a case of typhus fever which had proved fatal to a mutual medical friend, summed up the symptoms with the enumeration of "abscess of the base of the brain," because he had discharge from the ear, although neither the ear nor the contents of the cranium were examined!

tility of the patient's imagination finds a ready similitude. Any increase of the circulation, or nervous excitement of any kind, particularly in chronic cases, invariably makes these ear-noises worse. We would earnestly call the attention of those engaged in the study of aural diseases, to the subject of tinnitus, as it is more than probable that a knowledge of the peculiarities of this symptom may yet be found to assist in the diagnosis of particular forms of deafness.

Deafness,—consisting either of impaired hearing or total loss of that sense on the affected side, coming on either contemporaneously with the pain, or succeeding it in a few hours after. If, however, but one side has been attacked, the patient is not at first conscious of his loss of hearing. In some rare cases there is for a short time during the progress of tympanal inflammation an exaltation of the sense of hearing, in which (like photophobia in ophthalmia) all sounds become intolerable.

To these local subjective symptoms may be added the following constitutional ones: increased heat of skin, headach with a feeling of weight in the head, sometimes well-marked hemicrania, great distress and anxiety of countenance, sneezing, coughing, and other symptoms of catarrh, sleeplessness, restlessness, some quickness of pulse, occasionally rigors, in some instances delirium, and even, in very bad cases, all the symptoms of cerebral disease, of which Case II. is an example. The digestive organs are seldom much engaged in the progress of the disease; the urine becomes high-coloured, and, towards the termination of the acute symptoms, deposits a copious pinkish sediment. The circulation, except in very severe cases, is seldom much affected.

The objective symptoms, or physical signs, consist, in the severe cases, of heat, pain, and slight erysipelatous redness of the auricle: in very aggravated cases, heat, fulness, and œdema, as well as pain over the mastoid region: in ordinary cases, slight tumefaction of the lining of the external meatus: complete cessation of the cerumenous secretion; a bright pinkish colour, and a swelling and polish of the membrane lining the auditory canal, which is streaked with long tortuous vessels: accompanied by heat and itching of that part.

The membrana tympani first loses its polish, then its semi-transparency,—becomes in the early stages, and in very mild cases, of a dull yellow, but this is variable and seldom seen; the most usual colour varies through all the shades of red, from a slight pinkish hue to that of a dark damask rose tint, and is caused by the different degrees of vascularity produced by the greater or less intensity of the inflammation. Soemmerring has faithfully represented the arteries of the tympanal membrane in the normal condition as two long vessels proceeding from above downwards and backwards along the course of the handle of the hammer, and branching on either side into the anterior and posterior vibrating thin portions of the membrane. During inflammatory action, however, like as in the coats of the eye, new vessels seem to start into existence, and to branch and inosculate till the whole seems one mass of bright or livid red. Generally speaking, the upper portion around the attachment of the head of the hammer is the first to become vascular, the last to regain the natural hue, and the part in which the colour becomes deepest. The vessels along the handle of the hammer are always well marked, though the line of attachment of that bone remains for a long time whitish, owing to the intimate connexion of the membrane to it at this part. Around the circumference of the membrane, within the ligamentous ring, particularly at its lower and anterior part, an areola of short vessels form a circle of almost a line in breadth; they all run towards the centre, and, when well marked, look like the zone seen in iritis, or, which is perhaps a better simile, the zone observed in the cornea in the commencement of cornitis, to which disease the appearances seen in myringitis bear a great resemblance. It is only in the early stages, or when the redness is disappearing, that this peculiar peripheral vascularity is well-marked. With this general

redness may in some cases be seen well-defined patches of ecchymosis, generally on the anterior vibrating portion; and as the vascularity increases, even the exact position of the manubrium cannot be recognised,—all is one red mass. The membrane also becomes swollen, and its surface apparently villous; rarely vesicles, and still more rarely pustules and small abscesses, form on its surface. Ulcers occasionally form upon it; these usually occupy the anterior part of the lower vibrating portion, but I have occasionally seen them situated posteriorly. It is possible that they may have commenced as vesicles or pustules, but we require more extended and minute observations to determine this point. Exudation of muco-purulent secretion, with detachment of the cuticle, both from the surface of the membrane and the parietes of the canal; perforation of the tympanal membrane, either by rupture, abscess, slough, or ulceration, but which it is not always easy to determine, also occur occasionally. The rupture usually takes place in the anterior portion, and close to the opening of the Eustachian tube; sometimes it may be seen as a round or oval hole, about the size of No. 8 shot, and appearing as if punched out of the membrane. In other instances the rupture takes place at the anterior inferior edge of the membrane, in which case the lower margin of the aperture is formed by the parietes of the canal, and cavity of the tympanum. In still rarer instances the rupture takes place in the posterior division of the membrane, below, and somewhat behind, the point or handle of the malleus.

In this condition, with the cavity of the tympanum open, polypoid growths occurring in the meatus, and granulating over the surface of the tympanum and its membrane, and a copious and very often fœtid discharge pouring both from the auditory passage and the drum, the case becomes one of otorrhœa, the peculiar symptoms and management of which I have already detailed in my former Essay.

Besides the peculiar vascular condition of the membrane

already referred to, lymph is very frequently effused between the laminæ, in the substance of its proper fibrous tunic, and there can be little doubt that, in the severe forms of the disease, this morbid product is poured out in large quantity upon the surface of the tympanum, the membrane of which must partake largely of the inflammatory action so visible in the external septum. That these lymphy exudations,—both by thickening the tympanal membrane itself, and by acting in a similar manner upon the lining of the cavity of the tympanum and the parts contained within it, by bands of adhesion within its walls thus drawing inward and arresting the vibrations of the membrana tympani, curtailing the motions of the ossicula, injuriously affecting the membranes of the fenestræ, and particularly by impairing the functions of those tympanic branches of the glosso-pharyngeal nerves which ramify on the mucous membrane,—are the principal causes of deafness, I have little doubt.

When rupture takes place, and that accumulations of blood, mucus, or purulent matter, pent up within the tympanum, are evacuated, relief is generally experienced.

In cases where neither rupture nor ulceration has taken place, as the disease advances, the vascularity of the tympanic membrane decreases, first in the centre of its vibrating portion, then around its circumference, and finally along the mallear attachment. The membrane assumes a muddy, yellowish, opaque colour; after this clears off we find it opaque throughout, or in spots; sometimes these opacities can be plainly discovered upon the interior of the membrane, like the speckled opacities seen upon the membrane of the aqueous humour. In other cases, the result of the inflammation is seen in the uniform greyish-white opacity, similar to leucoma of the cornea; and in time, as the superficial polish is restored, the membrane presents a pearly aspect very different from the semi-transparent character of the healthy condition.

A not uncommon effect of inflammation of the tympanum

and its membranes, particularly when allowed to run its course unchecked, is a drawing inward of the membrana tympani. In such cases the handle of the hammer forms the most projecting point seen at the bottom of the auditory canal; and the anterior and posterior divisions of the membrane can be distinctly seen forming deeply curved folds upon either side of it. At times the membrane can be elevated to its natural position by inflating the drum through the Eustachian tube; but in such cases, as soon as the pressure from within is removed, it immediately resumes its former position. Considerable discussion has occurred among authors as to the possibility of collapse or falling inward of the tympanal membrane, occurring from shocks or loud noises, &c. This is not the place for investigating that question, but of the existence of the pathological condition which I have thus described, and of its being sometimes the consequence of inflammatory action, I have no manner of doubt. It is a peculiarity I demonstrate to the class at the hospital daily. Mr. Toynbee's dissections confirm my observations on this point, and, in some instances, explain the cause, namely, adhesive bands existing between the back of the membrane and the inner wall of the tympanum.

In anatomical preparations, however, it must be remembered that it is the position that the parts are most likely to assume; and, moreover, it is not an uncommon peculiarity even in persons who have never suffered from any affection of the ear, *of which they were conscious*, and who were not aware of their hearing being in any way impaired until tested by the watch.

The inflammatory process must, in severe cases, also extend into the mastoid cells; the periosteum lining the bony portion of the auditory canal will in time become engaged, as well as the pericranium over the mastoid process, and post-aural region of the skull, and present the appearance, already described. If allowed to proceed unchecked, either by the efforts of nature or art, the death of the bone beneath will follow; while, in cases still

more severe, the entire petrous portion of the temporal bone will become inflamed,—the dura mater will separate from it,—purulent deposit takes place in the cavity thus produced,—the brain, as well as its investments opposite those portions, will partake of the inflammation,—and death follow, either from abscess or diffuse inflammation of the cerebrum or cerebellum.

During the progress of the inflammatory action in the tympanum and its external membrane, the throat, in some cases, becomes engaged, its mucous membrane presenting a copperish red appearance, and becoming swollen and infiltrated. The tonsils also become swollen; there is some difficulty of deglutition; and if an examination of the pharyngeal extremity of the Eustachian tube be made with the finger, according to the method described at page 15, considerable pain is experienced in the track of the tube, as well as in the middle ear. There can be little doubt of the inflammatory condition of the middle ear, extending over the Eustachian tube, and causing such thickening and obstruction of its lining membrane, with, perhaps, an accumulation of mucus, as greatly impedes the transit of air into the drum, and causes that peculiar feeling of stuffing, and occasional sudden bursting in the middle ear, of which we are all conscious when labouring under influenza or catarrh.

The nose sometimes partakes in the unhealthy condition of the neighbouring mucous membrane, and the feeling of stuffing in that part, together with much faucial respiration, is not an uncommon attendant upon acute inflammation of the middle ear and membrana tympani.

In some rare cases, paralysis of the muscles of the face, on the affected side, presenting all the peculiar phenomena of that disease, is produced; an instance of which will be given in one of the cases (although in the chronic form) to be related hereafter. I am strongly inclined to think, that many of the cases of paralysis of the seventh pair of nerves, where we have no mechanical lesion, such as caries or exfoliation,

and which heretofore were usually attributed to cold, &c., may have been caused by some form of otitis; and I would therefore beg to direct the special attention of physicians to the peculiar condition of the ear in all such instances.

This form of inflammation chiefly attacks the young and middle-aged; one ear is much more frequently affected than both; the light-haired and fair-complexioned are more liable to it than the dark. So much more frequent are its attacks in spring than at any other period of the year, that it sometimes seems to be epidemic at that period. The duration of the disease varies from six to fourteen days, but may last a month, and its effects several months.

TREATMENT.

The temperature in cases of acute myringitis should be strictly attended to; the patient should, if possible, be confined to a warm well-ventilated apartment, or if obliged to go abroad, the cold air should be carefully excluded from the ear; but in the severe form of the disease it is absolutely necessary to confine the patient to bed.

Depletion is strictly enjoined, but I have seldom found it necessary to resort to general bleeding. Local depletion is imperatively required, either by cupping or by leeches: the former is not easily managed so near the part affected as to be of much service; in cases, however, of very severe internal otitis, it may be had recourse to, and a dextrous cupper will abstract several ounces of blood from the soft parts immediately behind and beneath the mastoid process; and if the head be much engaged, blood may be abstracted by the same means from the nape of the neck. Leeches are, however, the most effectual means of abstracting blood and relieving pain in all such cases. They should not, however, be applied in the usual manner behind the mastoid process: to be of service they must be applied with a leech-glass immediately around and within the external meatus; in the fossa behind the tragus, and, if necessary, in front of that prominence, in the hollow formed by depressing the jaw(*a*). From four to six leeches may be readily applied around the meatus, and in this situation they will produce more permanent and immediate relief than three times the number affixed over the mastoid region. The application in front of the tragus is also very much more effectual than upon the mastoid region. When, however, the latter locality becomes itself the seat of inflammatory action, they should also be applied freely all over it. Where we have already recently applied leeches in the two first-mentioned localities, and that the parts have thereby become swollen and irritated, the next most advantageous position is beneath the lobe of the auricle, behind the ramus of the jaw. I do not know any painful affection in which leeches applied in the manner directed produce the same amount of immediate relief, as in the disease under consideration. They should be had recourse to again and again, even upon the same day, to relieve paroxysms of pain, as well as to lessen the degree of redness and vascularity observable.

The application of heat and moisture is particularly grateful in such cases; steaming the ear by holding it over the vapour of some very hot water placed in the bottom of a long, narrow vessel, medicated with hyosciamus, opium, belladonna, or with the ordinary decoction of marshmallows, camomile, or poppy-heads, if faith be placed in such, gives great comfort. The Russians employ a peculiar apparatus for relieving pain in the ear, consisting of a funnel-shaped roll of linen, the small end of which is applied to the meatus, while the large end, in which various balsamic substances are placed and set fire to, is allowed to burn down slowly like a moxa. A warm linseed-meal poultice renewed every two or three hours, and particularly applied at bedtime, gives great relief. Stupes and fomentations are not, I find, as efficacious in aural as in ophthalmic inflammations.

(*a*) A morsel of cotton should be inserted into the auditory canal before applying the leeches; this prevents their going in too far, and also excludes the blood, and keeps it from collecting and clogging within the passage.

The bowels should in this, as in all other febrile diseases, be opened, but the condition of the digestive organs does not appear to influence the inflammatory affections of the ear as much as they do those of the eye. The state of the skin, however, which is generally hot and dry, requires our more especial attention; and sudorifics are, in the early stage of the disease, decidedly indicated. Having leeched, fomented, and, if necessary, purged, James's Powder, combined with small doses of blue pill and henbane, will be found very efficacious. Abstinence from animal food, and the use of the pediluvium, together with all such means as are calculated to allay inflammation and febrile excitement, should be had recourse to.

Counter-irritation, by means of small blisters applied upon the bald space behind the auricle, and below the lobe, are advantageous in the more advanced stages of the disease, and after local depletion has been fully employed. Generally speaking, blisters are too much relied upon, or applied too early in the disease; but as it advances they will be found highly useful, and the surfaces which they expose may with advantage be dressed with mercurial ointment.

Having resorted to all those means, we should, if the symptoms,—not only of pain and deafness, but of the redness and vascularity of the tympanal membrane,—remain unrelieved, at once have recourse to the use of mercury. Indeed I am now so fully convinced, not only of the utility, but of the urgent necessity of employing mercury in these aural inflammations, that I do not hesitate to recommend its use in the early stages of all such affections. A pneumonia, a pericarditis, an inflammation of a large joint or a serous cavity, an iritis, or other form of internal ophthalmia, may, it is true, get well by simple depletion, &c.; but will any experienced practitioner of the present day risk such a case without having recourse to mercury? For the reasons applicable in these instances; from the peculiar effect which mercury exercises, not only in most inflammations, but especially over those of fibrous membranes; and in order to

arrest the exudation of lymph, and to cause the absorption of those effusions which, by thickening the membranes, and causing those pathological effects to which I have already so frequently alluded, and which prove so constantly the cause of subsequent deafness,—as well as the urgent necessity for arresting the progress of inflammation in a part that may prove destructive to life,—it is, that I so strongly advocate the employment of this remedy. I find that, in most instances, where it is employed early, it produces, as soon as it affects the system, as well-marked an improvement in all the symptoms as it does in any of the other inflammations which I have enumerated. It should, therefore, be given in small, frequently-repeated doses; and the formula I find most efficacious is calomel and blue pill, guarded with opium, and, if the stomach will bear it, a very small quantity of James's Powder. Not only should the gums be touched, but the patient should be kept under its gentle influence for some days, in order to insure an ultimate beneficial result.

In the subsequent management of the disease, the iodide and bromide of potassium, or very minute doses of the bichloride of mercury, in some of the preparations of bark, will certainly hasten the cure, as well as promote absorption of the deposits and adhesions already alluded to. The treatment of the tinnitus which remains shall be considered under the head of the chronic form of the disease.

Under no circumstances should we pour any stimulating or sedative liquors into the ear(a). The state of the part

(a) From the frequency of this most unjustifiable practice in this country, I feel I cannot too strongly deprecate it. If there is one substance more irritating than another in the Pharmacopœia, it is poured, *secundum artem*, into the ear, to relieve pain, or cure deafness, to lessen or to increase the secretion of wax! This practice is often the cause of myringitis. Why are not these essential oils, stimulating liniments, this turpentine, creosote, tincture of cantharides, oil of origanum, &c., poured into the eye or injected into the urethra in cases of inflammation of these parts?

should be examined with a speculum daily, or oftener if necessary; and then, should we discover an ulcer, it may be touched with a solution of nitrate of silver applied upon a fine camel's-hair pencil. If otorrhœa has occurred either from mucous discharge from the external surface of the tympanal membrane and the auditory canal, or owing to pus or mucus escaping from the middle ear through an aperture in the membrana tympani, or from an abscess occurring in the walls of the external auditory canal, we should remove the discharge by very gently syringing the part with simple warm water, or the most bland, unirritating fluids; but during the high inflammatory process no astringent injections whatever should be employed.

If polypoid growths of any magnitude sprout suddenly from the auditory canal, they should be removed with the snare; and this, if properly done, does not give rise to any fresh attack of inflammation.

Should the mastoid process, or the parts covering it, become engaged, and that the methods already recommended fail to give relief, or that even an indistinct sense of fluctuation can be discovered, we should not long hesitate to make a free incision in the periosteum there, at least an inch in length. In performing this operation the head should be firmly secured, and supported against some unyielding substance, as the back of a high chair or the breast of an assistant. A stout scalpel is the best instrument to employ; it should be grasped so that the fore-finger and thumb may come down upon the blade, so as to leave about an inch of it uncovered. It should be inserted steadily till the point reaches the bone, which it should be made to traverse, for the full length of the incision. By this means we secure complete division of the periosteum. With regard to the line of the incision, circumstances may require its being made in other directions, but I find that it is most generally required parallel with, and about an inch from the attachment of the auricle. The knife should be drawn from below

upwards; and from the swollen state of the parts, the depth which we are sometimes obliged to introduce the instrument is often nearly an inch. The hæmorrhage, unless we wish to extract blood, may be arrested by placing a dossil of lint within the incision. The cut surfaces generally present the brawn-like appearance seen in phlegmonoid erysipelas. Although pus may not have been reached by the incision, still immediate relief is almost invariably experienced. The subsequent management of this particular part of such a case must depend upon the circumstance of exfoliation, &c. The treatment of the chronic form of the disease shall be considered in the subsequent part of this communication.

The following cases exhibit many of the phenomena detailed in the foregoing description. They are given at somewhat greater length than would be necessary, were the diseases of the ear as much attended to by the general physician or surgeon as they ought, or if the treatment of these diseases formed a part of the present system of medical education in these countries.

Case I.—*Acute Myringitis and Tympanitis*(a) *in both Ears, with severe Head Symptoms; Recovery under the use of Mercury.*

Master J—, aged 12 years, with light hair and florid complexion (whose elder brother had been under my care a short time previously for chronic inflammation of the left, and acute inflammation of the right ear), had always enjoyed good health, and never had any aural affection, till Sunday, the 1st of August last, when he was attacked with slight pain in the right ear. Upon the Friday previous he had bathed in the open sea five times, and had dived frequently each time. Upon the day following he bathed three times, and also dived. He awoke on Sunday morning early with some pain in the right ear, but

(a) By the term myringitis we understand inflammation of the membrana tympani; and by tympanitis, inflammation of the cavity of the tympanum.

made no complaint of it, as he says it was but slight; it was accompanied, however, by a feeling of pressure, as if something was bursting out through the ear. He bathed, however, again, twice upon that day. Towards evening pain came on in the left ear, and increased greatly in the right. He retired to rest early, and having been reminded of the provocation for his pains, he made no further complaint. About twelve o'clock that night, however, his mother was awoke by his cries and moans, the result of the extreme agony which he was then suffering. A neighbouring practitioner was applied to, and some camphorated oil and laudanum dropped into the ear. This treatment, however, afforded him no relief, and he remained awake all night, moaning much, and complaining of the violent pain in his head and ears, which he likened to a sharp instrument penetrating from without.

I saw him on Monday morning, the 2nd, about ten o'clock; the face was flushed, and the countenance anxious and expressive of extreme pain. The pupils were rather more contracted than natural, and the eyes slightly sensitive to light; he had some heat of skin, but the pulse was not above 76; the bowels were constipated, and the urine natural. Upon examination the auricle and external meatus were found natural; considerable pain was experienced upon pressing the cartilage behind the articulation of the jaw, but pressure over the mastoid region was borne with impunity. Upon introducing a tubular speculum into the external meatus, the auditory canal was found of a light rose-colour, quite dry, and devoid of cerumen; the membrana tympani was distinctly seen of a deep pink colour, generally diffused over it, but increasing in intensity in a crescentic form round its lower insertion, and also in the line of the attachment of the malleus. The appearances were nearly the same on both sides. As this boy was brought to my house I had a better opportunity of accurately recording the state of the parts than one is usually able to effect in the sick chamber. The appearance of the throat was

normal; the finger pressed against the mouth of the Eustachian tube caused but slight increase of the pain. Moving the articulation of the jaw, the act of deglutition, mastication, or coughing, were scarcely attended with any aggravation of the symptoms. Pressing air through the Eustachian tube, by holding the mouth and nose, and making a forced expiration, was also unattended by any unpleasant symptoms, but it passed up with great difficulty. Hearing then unimpaired.

He was ordered to be put to bed; to take a purgative bolus, and to have two leeches immediately applied to the posterior margin of the external meatus, as far in as possible, on both sides. The leeches afforded some relief, but towards evening the pain returned with great violence. He became quite delirious about six o'clock; did not know his friends; and could with difficulty be retained in bed. I saw him about eight o'clock; he was then in high fever, but more sensible; there was great heat of skin; pulse 80, and fuller than in the morning; tongue clean; bowels had been fully opened; made water freely; urine limpid; no thirst; knows all his friends now, but does not pay much attention to what is going forward about him; is quite rational when spoken to; complains of intolerance of light; face has become more flushed and anxious; complains now of the great weight of his head, which he rolls about from side to side; has had no sleep. On examination I found that the redness of the passage and membrane of the drum had greatly increased since morning, but there was no tumefaction of either. Pressure or percussion of the mastoid process, and the infraaural region, was borne without wincing. Two more leeches were ordered to be applied over the articulation of the jaw, in front of the tragus upon each side, and small doses of calomel, opium, and James's Powder to be administered every third hour. The ear to be steamed over hot water, and a linseed poultice to be applied subsequently: scarcely any diminution of hearing.

Tuesday, 3rd. Has passed a sleepless night, raving occa-

sionally. All his previous symptoms continue unabated, in addition to which, he now, for the first time, complains of noise in his ears, which he likens to that of the sea or tide. This noise is, he says, generally diffused through the head as well as in the ears. The pain is somewhat increased. He says he feels as if a lance was running into his head; bowels free; gums and breath unaffected by the mercury: blisters ordered to be applied behind the ears upon both sides. During the night of Tuesday he again became violent, and did not know his friends. The urine became remarkably dark-coloured. He had no sleep. The mercury was steadily persevered in, and towards morning he complained of some soreness of his mouth and gums.

Wednesday, 4th. Countenance less anxious; pulse not so full; pain in ears and head very much less; mouth slightly sore; complains of pain in swallowing, which he refers to the middle ear; has now become very deaf, and complains of increase of noise; this noise he describes as now of two kinds,—a continuous, uninterrupted bellows sound, and an occasional ticking, like that of a loud watch, which commences and stops suddenly; passed another sleepless night; raved occasionally; pain has very much lessened; membrane and passage unaltered: interval between doses of mercury increased.

Thursday, 5th. He is much better in every respect; he has had no delirium since last report; lies quiet on his side; the light is still offensive to him; skin cooler; pulse 80; bowels free; mouth very sore; deafness still continues; noise in head not so violent; urine high coloured: mercury stopped. The membrana tympani and auditory canal are much less red; the occipital region was ordered to be shaved, and two small blisters to be applied behind the insertion of the mastoid muscles. On Thursday night he was remarkably tranquil, and had some sleep. His chief complaint now is of the soreness of his mouth from the effects of the mercury.

Friday, 6th. At eleven o'clock this morning he was sud-

denly attacked with acute pain in both ears, of a sharp lancinating character. Leeches were again applied round the meatus on both sides, and warm stupes and fomentations again had recourse to. These means afforded him relief in a short time.

Saturday, 7th. Has slept well during the previous night; has had no return of the acute pain, but a dull aching still continues in both ears; he is very deaf to-day, but he is not so sensitive to light; the bellows noise still continues in his ears, and that which was formerly described as the ticking of a watch, he now likens to the clapping of two pieces of iron together. He only hears an ordinary ticking watch when it is pressed against the auricle of the left side, not at all on the right; he does not hear it when applied to the forehead, or held between the teeth, and but very slightly when applied upon the mastoid process. He complains of a return of the weight in his head to-day; sleeps much; bowels free; urine of a dark brown colour, and depositing a pinkish sediment; mouth very sore. Upon the visit at four o'clock in the evening the countenance was found more tranquil than on any previous occasion; the skin cool; pulse 75; functions natural: pressure on the tragus is now borne with impunity. Upon inspection the membrana tympani was found much less red, particularly on the left side; it is also beginning to clear above the malleus; mouth still very sore; ordered a gargle, and to have light broth.

Monday, 9th. Much better in every respect. A slight muco-purulent discharge now appears from the meatus of the right ear. On removing this with a little tepid water from a syringe, and bringing the membrana tympani within the field of the speculum, the redness was found to have greatly disappeared, except on two or three spots, about the size of pin-heads; all the intermediate portions of the membrane had become white, and apparently thick and pulpy. Upon the left side there is a slight moisture from a mucous discharge, which coats over the surface of the membrane of the drum, and the inferior portion of the wall of the canal. Having removed this with a little

cotton on a probe, the vascularity which had previously appeared on those parts was found to have greatly diminished; but the membrane itself had become thickened and opaque; he is quite free from pain; the hearing distance has increased to about two inches on each side; ordered three grains of the hydriodate of potash three times a day, and nutritious diet. On the right side two small glands have now appeared beneath the lobe, and another slightly enlarged over the mastoid process.

Thursday, 12th. Has very much improved in every respect since last report; is now quite free from fever, but is very weak and languid; tongue clean; soreness of mouth quite removed; pulse 60; has some appetite; sat up for a short time yesterday; glands in the neck much lessened, that over the mastoid process still tender; is quite free from pain in the ears, but still complains of a slight, generally-diffused pain in his head; there is no intolerance of light; hearing distance has increased to eighteen inches on each side; has had no discharge from the ear since; the loud ticking noise has quite disappeared; but the buzzing or bellows sound is still slightly perceptible; any surrounding noise is particularly distressing to him; he says he feels as if it struck his ear. Upon examination of the right ear, the passage is found to be quite dry, and of a light pink colour; the membrana tympani generally is somewhat redder than on the occasion of my former visit; and, besides this generally diffused redness, there is a deep-coloured ring of vessels to be seen, forming a crescentic band about a line in breadth, occupying the lower portion of the membrane, the vessels of which can be distinctly seen running in nearly straight lines from the circumference towards the centre, very similar to some of the forms of corneitis. The projection of the hammer-bone is marked by a fasciculus of dark red vessels, running along the course of its attachment. In the left ear the general redness of the passage and the membrane is not so great, and there is no ring of vessels such as exists upon the right side. He states that, on Tuesday, on blowing his nose, he felt as if something gave way in his right ear, and that immediately his hearing increased, and on repeating the experiment a few times, the same phenomena took place in the left ear. Since then his hearing has gradually improved to the present time; he was ordered to be blistered again behind the ears, to continue the use of the potash, to sit up for a few hours every day, and have nutritious diet. His functions are all natural, and he sleeps tranquilly through the entire night.

Monday, 16th. Has continued to improve; hearing has increased to three feet upon the right, and four feet upon the left side. Upon examination the right membrana tympani is found much less vascular but somewhat more opaque than the left, which is still of a uniform pinkish colour, but has, nevertheless, regained its polish and semi-transparency much more than the other. The buzzing noise is still slightly felt. The blisters were repeated, and the potash, with tincture of iodine continued; slight open air exercise permitted.

Wednesday, 18th. From the general improvement in his health, he was enabled to visit me at my house on this date. He states that he is now quite well, but is still weak; he looks pale and thin; the buzzing, and all other noises, have completely disappeared. The membrana tympani on the right side is found to have lost much of its vascularity, but is uniformly opaque, and is also dull upon its surface; with this ear the hearing distance is now four feet(*a*), whereas with the left, which is still very vascular, but much more transparent, the hearing distance is now full six feet. A generous diet and the potash and iodine ordered to be continued.

Sept. 25. His general health is now quite restored; his hearing as good as ever; the noise has entirely disappeared. During the past month a blush of redness has several times appeared upon the left membrana tympani. Still his hearing

(*a*) The same watch having been used in this and all the other cases in the report, the comparative amount of difference in hearing is correct.

distance with that ear is somewhat greater than on the right side, in which the membrane is not vascular, but slightly opaque. Occasionally leeching, blistering several times, and the use of the iodine and potash internally, have now completely restored him.

The constitutional symptoms in this case were more than usually severe, and such as might lead the practitioner to suppose the brain or its membranes engaged. We also learn from this case that inflammation of the tympanum and its membrane may produce such a degree of deafness as that the watch cannot be heard, even when *applied* to the ear.

In all probability the inflammation commenced and was originally confined to the tympanal membrane, and afterwards extended to the middle, and, possibly, the internal ear.

From the latter stage of this boy's case we also learn a fact worthy of observation, namely, that it is not the amount of vascularity, but the degree of thickening and opacity in the membrana tympani, which produces the deafness.

Case II.—*Acute Myringitis and Tympanitis of one Side; Immediate Recovery under the Use of Mercury.*

Catherine Lawlor, aged 21, applied at the hospital at ten o'clock on the morning of the 18th of April, for an attack of intense pain in her right ear. She states that she has not been "regular" for the last six weeks; that she was attacked four days ago with catarrh, attended with considerable stuffing in her nose, and the other usual symptoms of that affection; that she had walked along the sea-shore the day before, with a cold wind blowing upon her right side. She went to bed tolerably well last night, but awoke at three o'clock this morning with a violent beating pain in her ear, accompanied by a loud noise, which she likens to the "puffing of a steam-engine;" the pain resembles that of a sharp instrument penetrating through her ear into her head, which she describes as most excruciating. She had also some pain and soreness over that

side of the head; she felt some difficulty of deglutition, owing to the pain it caused her. Coughing, sneezing, or any motion of the temporo-maxillary articulation, greatly aggravated her sufferings, and gave her a feeling of bursting in the middle ear.

She rose at seven o'clock, felt great sickness of stomach, and had a well-marked rigor whilst dressing. She immediately applied to a neighbouring practitioner, who put some drops with a piece of cotton into her ear, which only aggravated her symptoms. These drops appeared to be oil and laudanum. 11 o'clock, A. M. Her pain still continues, and the noise has increased; there is slight redness and great heat of the auricle. The pain is increased on making pressure over the tragus in front of the meatus; on pressing or percussing the mastoid process slight pain is also complained of. The pain in her ear, however, is not increased by these means, nor is it referred to the tympanum. She has no pain beneath the meatus, nor behind the angle of the jaw. The hearing distance, with an ordinary ticking watch, is scarcely three inches in the right ear. On closing the meatus of the left side the noise is greatly increased. On examination with a speculum the auditory canal is found highly vascular, dry, devoid of cerumen, and exceedingly tender to the touch. The membrana tympani has lost its polish, and is of a bright, florid, generally-diffused red colour, spotted with small patches of a deeper hue, like minute ecchymoses. The projection of the malleus can be recognised, of a darker colour than the surrounding parts, with a whitish line in the centre. Below the malleus, and towards the posterior part of the membrane, a well-defined vesicle, about the size of a grain of mustard seed, and filled with a brownish fluid, can be seen. Upon her holding the mouth and nose, and pressing the air into the Eustachian tube, she experiences considerable difficulty in making it pass up upon that side, while it passes with facility into the tympanum of the left. The ear, or a stethoscope held to the right side during this operation, readily perceives

as soon as the air reaches the tympanum, a squeeling and gurgling sound, as if the air passed not only through a narrow passage, but through a fluid like mucus. This pressure of air into the tympanum greatly aggravates her symptoms.

Upon looking into the mouth, the fauces, uvula, and back of the pharynx are found nearly of their natural colour. Upon inserting the forefinger of the right hand into the mouth, and pressing its point upwards, backwards, and outwards, towards the mouth of the Eustachian tube, considerable increase of pain is experienced in the middle ear. The tongue is coated and flabby; the pulse regular; but there is heat of skin, and considerable anxiety of countenance. The left ear is natural in function and appearance. This patient suffered from rheumatism of the upper extremities some time ago.

Four leeches were applied around the meatus, as far in as possible, and four in the depression in front of the tragus. She was ordered to foment and steam the ear over hot water, placed in the bottom of a long, narrow mug, frequently during the day; and a purge was administered.

April 19th. States that she received immediate relief from the leeching. The countenance is less anxious, and she slept well all night; the noise of a steam-engine is altered to a gurgling sound; the pain and all other symptoms are relieved; the membrana tympani, however, remains nearly the same in colour, but the vesicle has become flaccid. She was put on the use of calomel and opium in small doses frequently repeated; a blister was applied over the mastoid process; the fomentation and warm vapour was ordered to be continued, and a linseed-meal poultice to be applied to the external ear at bed time.

April 20th. Continues to improve. Noise changed to that of the ringing of bells; the pain, on pressing the mouth of the Eustachian tube, is much less; the membrana tympani is less vascular; the general symptoms are all improved; the mercury to be continued.

April 21st. All the symptoms relieved; the mouth is slightly sore; no pain on pressing anywhere around the ear or meatus; all heat and vascularity of auricle is removed; the membrana tympani has lost its vascularity, but is slightly more opaque, and whiter than natural; the vesicle has quite disappeared; three or four large vessels can still be seen coursing along the handle of the malleus. Upon forcing air through the Eustachian tube into the tympanum, a slight gurgling noise can be perceived in the middle ear, and of the peculiar sensation which it imparts the patient is quite conscious. During this operation and while the membrane is within the field of the speculum, a slight blush of redness, of a pinkish hue, is observed to be produced in the membrane. The hearing distance is increased to four inches. A copious red deposit was observed in the urine. She has been slightly purged by the mercury; ordered to lessen its dose to one pill night and morning.

April 23rd. Continues to improve in hearing; noise as before; she has had no return of pain in the ear; the pain and soreness in the head gone; no flying pains or other rheumatic affection; the mouth is very sore: ordered to stop the pills, and take the sixteenth of a grain of oxymuriate of mercury with decoction and tincture of bark three times a day; generous diet.

April 25. Continues to improve rapidly; membrana tympani is more transparent than upon last examination. Hearing distance is increased to twelve inches; slight pain is still felt on pressure over the lower portion of the mastoid process, and opposite the point of the styloid process, in which latter place it is still increased on coughing: ordered to continue the oxymuriate and bark, and apply another blister.

May 1st. Ceased attendance at the institution; all her symptoms having now disappeared, with the exception of a slight buzzing occasionally. The hearing, she says, is perfectly restored.

September 1st. I had an opportunity of examining this young woman again this day; she states that she is perfectly well in every respect, and that her hearing is quite restored; but she says that she occasionally suffers from a slight "ticking noise" in the ear which was affected. Upon examination I found the membrane of the drum upon this side presenting a slightly mottled appearance, particularly towards its lower edge, but without an opacity of any account. Her hearing, she says, is equally perfect on both sides; but upon testing it by the watch, the hearing distance is found to be two feet less upon the right side than upon the other.

Case III.—*Severe Rheumatic Inflammation of the Membrane and Cavity of the Tympanum, with Periostitis, Polypus, &c.*

Mr. F., aged 49, with light hair and fair complexion, had suffered several years ago from a severe attack of rheumatism, in which his heart was affected, caught while exposed to a cold wind upon the top of a coach during a long journey through England; since that period he has been very liable to catch cold, in the head particularly, when the feet were exposed to damp or a low temperature. These attacks of catarrh were characterized by violent fits of sneezing and running at the nose, &c.; latterly his sense of smelling became greatly impaired, and he perceived a stuffing in the right nostril which rendered him very uncomfortable. During the summer of 1846 he was attacked with cough, expectoration, and other symptoms of bronchitis, in addition to the catarrhal affection. Having recovered from this, he remained in good health till January, 1847, on the 28th of which month, during a period of very wet and severe weather, his present attack commenced. His own words are: "About this period I wore a muffler about my neck; one sharp morning I walked into my office, laid it aside on my arrival, and, being called off suddenly to the Four Courts, I forgot to put it on again. On my way there I felt a blast of sharp, cold air strike my throat on the right side, under the ear, but I

did not pay much attention to it, and remained in Court most of the day, with my hat off occasionally. About 2 o'clock I felt a slight pain in the right ear, and got a bit of cotton-wool put into it; about 6 o'clock I returned home from my office. I called at my apothecary's, who dropped some warm oil and laudanum into my ear, which for a time lessened the pain, but did not completely remove it; but I was enabled to resume my business as usual next day."

Mr. Collins, to whom Mr. F. first applied, writes to me as follows: "When Mr. F. first called upon me he complained of pain in his right ear, and also of slight shooting pains about that side of the head; he looked a little dull and heavy, but there was no fever, quickness of pulse, headach, deafness, or other symptoms of importance present. I considered his attack to be of a rheumatic or neuralgic character, particularly as he had suffered a few years before from severe rheumatic fever; and as the pain in the ear was what he most complained of, I dropped some tincture of opium and olive oil into it, and applied a bit of wool to prevent its coming out; I also ordered him an aperient. Upon the next evening Mr. F. again applied to me on his return from Court, and stated that he had derived relief from the drops until he was again exposed to cold and draughts that day: the drops were again applied and with relief. The next day Mr. F. resumed his usual avocations, but the pain continued to increase, and four leeches were applied behind the ear, and a poppy fomentation and a poultice applied with considerable relief, though some slight pain still remained in the ear and the side of the head. His sense of smelling now returned and continued perfect for a few days, when it was again lost. Mr. F. confined himself to the house for the next two or three days, but would not consent to do so longer, as he felt much relieved of the pain, and business of great importance required his attention at his office. In a few days from this date his former symptoms returned, to relieve

which he was strongly recommended by a non-medical friend to drop into the ear a liniment of oil of turpentine and oil of cinnamon, which I prepared for him, but, having experienced no benefit from this, he applied to you."

I first saw this gentleman upon the 13th February; he complained of acute pain in his right ear, which, as appears from the foregoing account, had continued off and on during the previous fortnight. The pain he described as "shooting from the ear to the temple and top of the head, accompanied with a boiling and pumping noise, like that of a steam-engine;" the pain also appeared, according to his own description, to reach to the throat, without making the throat sore; it was increased by sneezing, but relieved by pressing the hand upon the ear and side of the head. Upon inspection, the auricle was found hot and somewhat swollen; the lining of the meatus and auditory canal was red, tumid, and completely devoid of cerumen; the introduction of the speculum, and the examination, caused a good deal of pain from the tenderness of the parts; the membrana tympani was of a dark, brown, red colour, had lost its polish, and appeared to be swollen and pressed outwards: the projection of the malleus could not be discerned in front of the ear; pressure in front of the ear gave a good deal of pain, but there was no tenderness over the mastoid process. Rest, abstinence, confinement to the house, constant fomentations, leeches round the meatus; with small doses of blue pill, James's Powder, and hyosciamus, at night, and an aperient in the morning, was the treatment resorted to during the next few days.

Upon the 19th, his symptoms, with the exception of the pain in the ear, continued much the same; he had also flying pains of a rheumatic character in the side of the head, the wrists, feet, and generally throughout the body. The pumping and boiling noise remained unabated: the deafness now became complete upon that side. The appearance of the ear

continuing unchanged, except that the meatus was more swollen, it was deemed advisable to place him under the influence of mercury,—an opinion in which Dr. Stokes, who saw him with me, at that time concurred. He was accordingly, but with some difficulty, mercurialized by means of small and frequently repeated doses of blue pill, calomel, and opium. When his mouth became sore, the pain in the ear and the noise lessened somewhat, and the general rheumatic affection disappeared; but the meatus and auditory canal now became so much decreased in caliber, owing to the thickening of the lining of these parts, that it was not possible to gain more than a glimpse of the red and swollen membrana tympani. The leeching and blistering were continued, and the surfaces denuded by the latter were dressed with extract of belladonna and mercurial ointment.

March 10th.—The cuticle became detached, and a slight muco-purulent discharge took place from the external meatus; the ear was then syringed with plain tepid water; he was allowed a more generous diet, and placed upon the use of the hydriodate of potash, with infusion of bark and tincture of orange peel. His general health was now improved; he slept better, and was able to go abroad and take exercise; the discharge, however, continued to increase, and emitted a very offensive odour; and, at the same time, he began to complain of a deep-seated soreness all over the side of the head, behind the ear, but particularly over the mastoid process and immediately below it. Towards the end of March, upon examining the ear carefully under a good light, a small polypoid excrescence of a light red colour, growing from the posterior wall of the canal, and completely filling up that cavity, was detected; this I removed with the wire snare, and the discharge then lessened; the soreness of the side of the head, the pumping, and the deafness, however, remained the same. Pressure over the mastoid process, and the post-

aural region of the head, very much increased the soreness, and it was now evident that the periosteum covering these parts was inflamed. During the latter part of the month of April, and all the month of May, the symptoms of periostitis remained much the same, and the scalp itself became inflamed, having a dusky, red hue, pitting on pressure, and feeling excessively sore to the touch. The treatment consisted in the frequent abstraction of blood from the affected part by means of a few leeches, and a small cupping-glass applied over the leech-bites; poulticing, inunction with different ointments, both of a sedative and absorbent nature, slight vesicants, &c., and change of air. Bark, potash, and iodine, were also recommended to improve the general state of the constitution. He had no headach, rigors, or perspirations, and his sleep and appetite were tolerably good; still, however, the pain continued, and the dusky redness and tumefaction of the scalp remained, although there was no evidence of suppuration. It was determined, in consultation with Mr. Cusack, to make an incision down to the bone, and thus free the periosteum, and give exit to any matter which might be contained beneath it. Accordingly, upon the 29th of May I made a perpendicular incision, about two inches long, nearly parallel with the posterior margin of the auricle, by inserting a sharp-pointed scalpel down to the bone at the point of insertion of the mastoid muscle, and carrying it upwards and a little backwards. The bone did not feel rough or gritty under the knife. A pledget of lint was inserted into it; and when the hæmorrhage had ceased, a linseed-meal poultice was applied over it.

The wound suppurated kindly, and all the surrounding soreness of the scalp and pain on pressure soon disappeared. As the discharge from the wound increased that from the meatus lessened, and in about ten days the wound itself healed without any exfoliation of bone. The pumping noise now ceased altogether, the discharge from the ear also lessened very

much, and all uneasiness in the parts ceased. During the month of July, and till the 12th of August, I only saw Mr. F. occasionally. Upon examining the ear carefully at this latter date, I perceived that the meatus had regained its natural size, and I discovered another second small polypus in the situation of the first; this I also removed, and Mr. F. came to me in a day or two to inform me that the discharge had now ceased altogether, and that the hearing had returned the night after I had extracted the polypus. He could now perceive the ticking of a watch at the distance of an inch from his ear, although he was quite unconscious of it when pressed against the auricle the day I last saw him. I could now distinguish the membrana tympani perfectly; it was of a dull white colour, evidently much thickened, but not perforated in any part.

September 3rd. He has continued to improve in every respect; his health and spirits are quite restored; all discharge from the ear has ceased; the tinnitus aurium now consists in a slight "booing" which appears occasionally: the hearing is slowly returning. The snuffling and loss of smell I now found to be caused in a great measure by a small gelatinous polypus which filled up the cavity of the right anterior nares, which upon being removed greatly assisted to restore both the nasal respiration and the sense of smell.

This case is instructive, as shewing the rheumatic character of some of the inflammations of the ear, and as exhibiting the occasional failure of the mercurial treatment to cut short the disease, particularly if it has advanced to any height, as this had. The discharge came from the external ear and the polypus. This morbid polypoid growth, thus appearing during the progress of an inflammation, should always lead the practitioner to suspect mischief going on in the neighbourhood, and should cause him to examine with great care the condition of the mastoid process and its coverings, although neither the existence of a polypus, nor the fœtor or dark colour of the dis-

charge, are of themselves a sufficient proof of caries or denuded bone. The appearance of periostitis, even at this late period, is not an unusual consequence of violent otitis; the inflammation may spread from the periosteum lining the bony portion of the meatus; or the mastoid cells may, and often are, the seat of inflammation, and this inflammation may extend from the layer of bone which covers them to the periosteum. If not relieved by such local and general means as were made use of in the early part of the foregoing case, the surgeon should not hesitate to cut down upon the covering of the bone, and divide it fairly for an inch or more of its length. Almost immediate ease follows this operation, even though we fail to discover the existence of pus; and, moreover, delay after a certain period may prove fatal. A thin shell of bone is occasionally thrown off in such cases, but not always. Generally speaking, the otorrhœa lessens when the discharge from the wound is fully established, although there may not be any communication whatever between the parts from which these discharges come. I had occasion to resort to this operation five times during the past year: in two cases it was followed by the exfoliation of a thin shell of bone; in all, hearing was restored either partially or completely. Performed in the situation and in the manner described in the foregoing case, the hæmorrhage which follows is generally very trifling. It is necessary to keep a tent in the wound till suppuration is established. When this pain over the mastoid process appears early in the disease, and is accompanied by an erysipelatous redness and œdema of the scalp, we should not hesitate in having recourse to incision immediately.

We have in this case another remarkable example of a mechanical impediment, such as the polypus, so completely obstructing sound that a watch held to the ear was not perceived, although hearing returned within a few hours when that mechanical obstruction was removed. There can be little doubt of the middle ear having been engaged in this inflammation, yet we have no evidence of perforation of the membrane of the drum having taken place. The only treatment at present employed with Mr. F. is that of occasionally washing over the auditory canal and membrana tympani with the ten-grain solution of nitrate of silver(*a*).

September 10th.—His hearing had increased to the distance of ten inches on the affected side. It continues to improve.

II. SUBACUTE INFLAMMATION OF THE TYMPANUM AND ITS MEMBRANES.

Besides the acute form of the disease, attended by violent pain, &c., which I have already described, there is a description of subacute inflammation of the membrana tympani, with which I have been long familiar, and which, although perfectly painless, is equally destructive to hearing. It generally appears in persons between 15 and 30. The first symptom to which the patient's attention is directed is deaf-

(*a*) It was with considerable surprise I read an article by Dr. Bonnafont in the *Gazette des Hôpitaux*, for November last, recommending a *powder of nitrate of silver to be blown into the ear*, for the cure of ulcerations attending otorrhœa. With still greater wonder and regret have I seen such a practice quoted and recommended in British journals. A more empirical practice, except that of a farrier blowing powdered white sugar and quicklime into the eye of a horse, to cure it of the "Haws," I never knew advocated. With as much reason should powdered caustics be blown up the vagina, or the rectum, or into the throat or nose, or into the eye, to cure a spot of ulceration on these parts, as into the ear; and with as much ease, certainty, and security can an ulcer in the auditory passage, or on the membrana tympani, be touched with a caustic, either in substance or solution, without injuring the adjoining surfaces, as into any of these cavities. See the London and Edinburgh Monthly Journal; Ranking's Half Yearly Abstract for July, 1847; and Mr. Ancell's Report on the Progress of Aural Surgery.

So long as practices, such as that recommended by Dr. Bonnafont, are quoted by our English journals, so long shall the treatment of diseases of the ear be considered an "opprobrium" to medicine.

In the present state of aural surgery the record of well-observed cases would greatly assist the progress of this department of medical science.

ness, which has appeared rather suddenly. It may be, but is not always, accompanied by tinnitus. The nature of the disease is only to be learned by a careful inspection of the membrane, which, if we see the disease early, is always of a pink colour, of a tint somewhat paler than that of the monthly rose. Through this, dispersed in various directions, we observe in some cases a few long, tortuous vessels. The transparency and polish of the membrane are seldom much affected at first. The auditory canal does not usually exhibit signs of disease, but the ceruminous secretion is arrested. Generally speaking, there are no constitutional symptoms present, and when tinnitus is an accompaniment, it is usually of a very light character, resembling a slight buzzing or singing. If allowed to proceed unchecked, the membrane becomes thickened and remarkably opaque, from lymphy deposits, and the deafness which ensues is of a most irremedial nature. Collapse or drawing inwards of the tympanal membrane does not usually follow this form of the affection, but ulceration, even to perforation of the membrane of the drum, is not an uncommon attendant upon it.

This disease is slow in its progress, and requires very careful watching. Cases of this nature have been, I feel convinced, repeatedly treated as "nervous deafness." I am inclined to think that it is a true myringitis, in which the inflammation is seated in the fibrous layer of the membrane. In this disease mercury is just as necessary as in that already detailed; it should, however, be given after a different fashion: to be effectual, it must be slowly introduced into the system, so as to produce a steady and gradual effect. The mouth should be kept sore until there is a decided improvement both in the vascularity and in the hearing, or until all hope of restoration has been abandoned, or other circumstances induce us to relinquish this mode of treatment. After the constitution has been fully affected by the mineral, the bichloride, given in doses from the

sixteenth to the eighth of a grain, dissolved in proof spirits, and taken in half an ounce of the cold infusion of bark, and a scruple or half a drachm of Huxham's tincture, three times a day, will be found highly efficacious. The preparations of iodine are also, in the advanced stage of the disease, worthy of trial; but I do not think that the preparations and combinations of iron produce in aural inflammations the same benefit which they do in constitutions labouring under ophthalmic affections of a like character.

Counter-irritation by means of tartar emetic ointment(*a*), or the continued application of Albespeyre's paper, keeping up a discharge from the integuments over the mastoid process, will hasten the cure. Should the constitution require it, change of air, removal to the sea, and generous living, &c., must be had recourse to.

To relieve tinnitus aurium, after the inflammatory action has been subdued, or the original disease which produced it has subsided, and particularly in cases where we find this symptom present without any apparent lesion of the parts which we are able to inspect, I have latterly found the preparations of the *Arnica montana* of decided benefit; indeed it is the only medicine with which I am acquainted that seems to possess a specific power over this annoying and usually most intractable complaint. The preparation I find most efficacious is the tincture both of the flowers and leaves, of which the patient should commence by taking fifteen drops in a table-spoonful of the infusion of Arnica, and a little of some cordial tincture three times a day. After a few days the dose should be in-

(*a*) Great care should be taken in applying this ointment behind the ears, as it is very apt to produce large unhealthy-looking pustules, not unlike the disease we know as "burned holes" (*pemphigus gangrenosus*), particularly if allowed to spread over the back of the auricle. To make it act more speedily it may be mixed with a little powdered white sugar, and spread upon a piece of lint, which, after the part has been rubbed with the ointment, is to be applied in the form of a plaster, and retained till the pustules are produced.

creased one or two drops daily, till it reaches thirty, or even more, unless headach or giddiness be produced, when we should at once lessen the dose, or omit the medicine altogether for a short time (*a*). The state of the bowels should be carefully attended to during the administration of this drug.

So long as any vascularity or recent deposit exists in the membrana tympani, notwithstanding manifest improvement of the hearing, we should not desist from employing means to remove it, as these cases are of a most insidious and protracted character. When ulceration exists, we should touch the part daily with a solution of lunar caustic, applied with a fine brush. The same mode of treatment is applicable to perforation of the membrane, and I have latterly been astonished at the number of cases in which, under this treatment, or touching the edge of the perforation with a fine point of the solid nitrate of silver, applied upon a *porte-caustique*, together with proper constitutional treatment, these apertures have healed up. After an extensive trial of various other escharotics, such as the nitrate of mercury, and the sulphate and nitrate of copper, I find the preparations of silver the best.

In all the inflammations of the middle and external ear, the secretion of cerumen is arrested, and it is long after the disease has been relieved, that the ceruminous glands resume their healthy functions, the auditory passage remaining dry and its lining scaly: or the wax which is produced being insufficient in quantity, of a very dark colour, and soon becoming

(*a*) The following is the formula for the tincture prepared for me by Messrs. Bewley and Evans. One ounce and a half of the *flowers* to a pint of rectified spirit of wine; macerate for fourteen days and strain; or, for the tincture of the *leaves*, the same quantity infused for a similar period in proof spirits. In prescribing these I usually order them in equal proportions.

Dr. Neligan says: "This tincture may be readily prepared by percolation, having previously macerated the flowers with a little of the spirit for twenty-four hours; or it may be prepared with the cut and bruised root in the proportion of ℥ii. of the root to Oj. of rectified spirit. Dose, f. ℥ ss. to f. ℥ii."—*Medicines and their Uses.* Second Edition.

hard and inspissated, &c. This deficiency of cerumen, which is but a symptom, is often set down as a disease, and various applications of ox-gall, creasote, &c., have been recommended to restore it. I find, however, that nothing produces a healthy action in the parts so soon, while, at the same time, it immediately supplies the best artificial succedaneum, as the *unguentum citrinum fuscum*, the soft brown citrine ointment, applied to the auditory passage in a melted state with a soft brush(*a*).

Case IV.—*Subacute Tympanitis with Paralysis of the Portio Dura.*

Patrick Rooney, aged 35, suffered from typhus fever about fourteen years ago, during which he had violent pain in his left ear, accompanied by a discharge which has continued ever since. He is quite deaf upon this side, and upon examination

(*a*) There is no other medicine in the whole materia medica so frequently prescribed by the practitioner, which presents the same differences, both in appearance and effects, as citrine ointment. According to the ordinary method of preparing it, as directed in any of the Pharmacopœias of the three kingdoms, it is impossible to procure it alike in any four different establishments. It is found of all shades of colour,—straw-coloured, grey, green, yellow, orange,—and of every degree of consistence, dry and hard, or soft and pasty. Many apothecaries in Dublin do not adhere to the pharmacopœial formula, but make it up according to a form of their own; some use fresh butter instead of lard and oil, and others different kinds of oil, as from habit or experience they find best. Some of these, however, are liable to the objections already stated. Moreover, if mixed with almond oil, as in diluting it into an eye-salve, although it looks yellow for a day or two, it soon becomes green, and gets a very unpleasant smell, no matter whether covered up or not, and in this state it is often very irritating. On explaining my difficulties, some two or three years ago, to Mr. Donovan, he procured me a citrine ointment of a very dark orange or brown colour, soft, perfectly and equally smooth, and which does not alter in any way by keeping, by exposure to light, by mixing with oils, or even by being gently heated to the point of fluidity: and it never acquires an acid smell. Its therapeutic effects I have had long experience of, and they are decidedly superior to those of the ointment in common use;—Mr. Donovan has not made known

the membrana tympani is found to be perforated at its anterior portion, and the whole membrane, auditory passage, and middle ear as far as can be seen through the aperture, are of a bright florid red; the ossicula, however, remain *in situ*. The hearing in his right ear remained perfect until the beginning of May last, when he began to perceive a deafness upon that side, which after a few days was accompanied by a most distressing noise resembling "the escape of steam;" he had also a rolling noise in his head, but no pain in either head or ear. He applied for medical advice, and had "drops" of an irritating nature poured into the meatus. Not having derived benefit from these, he applied at St. Mark's Hospital on the 29th of May, 1847. The noise and deafness were as already described; in addition he suffered from headach and pain in his face.

The right side of the face was then completely paralyzed, presenting the usual appearance of fulness and smoothness; the mouth drawn to the left side, the eye staring from inability to close the lids, the tears flowing over upon the cheek, the nostril collapsed, the colour of the skin somewhat heightened, and its temperature considerably raised beyond that of the opposite side. The auditory canal was dry and red; the tympanal membrane had completely lost its polish, and presented an

its constituents, nor its mode of preparation. Mr. Nicholls has made for me a citrine ointment precisely similar in colour, smell, consistence, and effects. He informs me that he has used rape oil instead of olive oil, and has never let the heat employed during the preparation exceed 200°. Mr. John Evans has employed cod-liver oil, and also seal oil, and the preparations thus produced are exceedingly elegant and useful ones. Messrs. Bewley have obtained for me a brown citrine ointment somewhat like those already mentioned, and they inform me that it is by using only the very purest olive oil. I find this ointment a decided improvement on the old preparation, and its composition should be investigated by those engaged in the preparation of medicines and pharmacopœias. When about to be used, it should be melted to the consistence of cream by placing the vessel containing it in hot water. It forms an admirable application in ophthalmia tarsi.

uniform pink appearance, not unlike blotting-paper. He had no pain anywhere around or about the ear, nor could pain or soreness be produced upon making pressure in any of the usual situations. He was able to inflate the tympanum; but could not hear the watch placed to the ear or any part of the head, and could with great difficulty distinguish the voice.

He was slightly mercurialized by the use of the hydrargyrum cum cretâ with cicuta; leeches were applied several times round the meatus, and small blisters over the mastoid process. As soon as his mouth became sore (in about ten days), the hearing returned, so that he could hear ordinary conversation very well; the vascularity of the membrane lessened considerably, and the noise decreased. On the 15th of June the paralysis had quite disappeared; he was then obliged to discontinue his attendance at the hospital, but was given some of the iodine and hydriodate of potash solution to take occasionally. Wishing to learn the result of this case, I sent for the patient, and again examined him upon the 10th of September last(*a*). He had no return of the paralysis; the hearing remained much the same; the meatus still red; the membrana tympani, over the head and handle of the malleus, was bright red; the rest of the membrane, with the exception of one clear spot in front of the point of the malleus, presented a dull, pearly hue; there were no folds observable in it, but a very opaque rim, like a broad arcus senilis, round its lower attachment.

The paralysis in this case seemed to have been caused by the inflammation in the ear extending to the portio dura. Now may not many of those cases of facial paralysis, so frequently met with, and some of which are apparently the result of cold, have been produced by a like affection? The state of the drum in all such cases should be accurately investigated.

(*a*) I would strongly recommend those engaged in hospital or dispensary practice in a large city, to make a note of the address of any patient whose case is interesting, in order that they may be able to learn the final result of such.

Case V.—*Sub-acute Myringitis; Mercurial Treatment; Recovery.*

The following case affords a good example of the subacute form of the disease, of the inattention paid to the early symptoms of deafness by practitioners in general, and the efficacy of antiphlogistic treatment. As the subject of this case, Mr. S., aged 19, is a young gentleman of very great intelligence, I give the history of his case, as far as possible, in the words of the narrative with which he has furnished me. "About the year 1836 I felt symptoms of deafness in both my ears for the first time, but on the application of blisters these symptoms passed away. From being but a child at the time, I have an imperfect recollection of the peculiar symptoms of my case. Again, in 1840, I became quite deaf in my right ear: this I mentioned to our family physician, but for some time he treated it as a joke, telling me merely that I was idle and wished for some holidays; however, on my frequently asserting that I really *was* deaf, he directed me to syringe my ear night and morning, and afterwards he dropped some liquid into it which he prescribed for me, but he did not make any particular examination of my ear. I continued to follow his advice for some weeks, but without any beneficial effect. I was then advised to get some rusty bacon, cut it into small shreds, and put one, morning and evening into my ear,—but with no better success(*a*). At last I applied a blister behind my ear, and kept it open for six months. This treatment, which may, and very probably would, as experience has since shewn me, have been successful, had it been resorted to in the first instance, was then of no avail. On two subsequent occasions, about Christmas, 1841, and July, 1842, I had an ear-ache in that ear, and the only application

(*a*) This is a very popular remedy in Ireland, and is frequently prescribed by medical practitioners. In cases of deafness, unaccompanied by inflammation, and solely the result of a deficiency of cerumen (very rare cases, by the way) it is innoxious, and may be effectual, but in no other case that I am aware of is it at all applicable.

which gave me relief was dropping warm laudanum into it(*a*). At the close of September, 1845, I felt my left ear one morning as if it were stopped, and perceived a buzzing sound in it, such as one feels on applying a sea-shell to it. This noise was increased at night when I lay in bed; it then resembled a constant, loud hissing. I became very deaf, and my difficulty of hearing increased daily; I also experienced an uneasy sensation, and a feeling of stuffing, in this ear, but no pain."

On the 21st of the November following I first saw this young gentleman. I found, in addition to the symptoms already described, a bright pink hue diffused over the left tympanal membrane, which, however, had not lost its polish, nor become opaque. He was with difficulty able to inflate the drum, and when he did so, the stream of air caused a slight squeeling and a mucous gurgling in the middle ear. The external meatus was dry, devoid of cerumen, and somewhat redder than natural. The throat, however, was normal. It was evidently a case of subacute inflammation of the membrana tympani, of the mucous membrane lining the cavity of the drum, and the Eustachian tube: with mucous engorgement of the middle ear. Upon the right side the membrana tympani was found thickened and opaque, and two or three large, red vessels spread over its surface, but on this side the air passed up with facility. Six leeches were immediately applied to the left ear, three round the meatus and three in front of the tragus, and warm stupes and fomentations prescribed. Upon the 29th his symptoms remained unabated and the appearances unaltered, so I immediately put him on the use of mercury, at the same time that a repetition of the leeches round the meatus,

(*a*) Laudanum dropped into the ear is one of the most popular remedies for ear-ache, and in many instances it certainly affords relief. We do not object to its application as a means of lessening pain, but we do as a remedial agent, while the *cause* of the pain is uninvestigated, and not treated according to the established rules for lessening inflammation, &c.

and the application of blisters over the mastoid process, was had recourse to. As soon as the mouth became slightly affected I observed that the vascularity of the right ear,—the one originally affected,—was very much lessened, and I then recommended the application of leeches and blisters to that also, and had the satisfaction to find that the hearing began to improve gradually on this as well as the left side.

As Mr. S. improved daily the mercury was omitted, and he commenced the use of bark and hydriodate of potash. Towards the end of December he was so much improved that I discontinued my attendance, and I lost sight of him for a short time. In the beginning of January, however, he again applied to me: worse than ever. The weather had been remarkably damp and unfavourable; he was much exposed to its influence, and had caught cold, which, to use his own expression, had "pitched in his ears." He was then so deaf that he could with great difficulty understand what was said to him, although addressed in a distinct and loud voice. The vascularity had returned in the left, and partially in the right ear, and the mucous engorgement of the tympanal cavities was more manifest. The same course had to be pursued as on the former occasion; he was confined to the house for a month, and kept under the gentle influence of mercury for the last three weeks of that time. I desired him to try occasionally to press the air into the drums, particularly when blowing the nose; and as the inflammatory condition subsided he was enabled to do this with greater facility. Each time the air passed his hearing was improved. At the end of a month the mercury was discontinued and the leeching given up. Small blisters were kept open behind the ears, and the use of bark and hydriodate of potash was persisted in for some weeks longer. I examined this gentleman in November last, and found that all trace of disease had been removed from the left ear, and that the tympanal membrane of the right was much thinner, and much less vascular and opaque, than when I

first saw him in 1845. His hearing is perfect upon the left side, and very much improved on the right, the hearing distance being increased on that side from three to fourteen inches.

In the foregoing case we have a good example in the right ear (which, when I first saw it, was in the condition of chronic inflammation, to be described in the next section) of the effects of neglect, and also of the efficacy of the antiphlogistic treatment, not only in the removal of recent disease, but in the improvement of an affection of several years' standing.

I could enumerate several other well-marked cases of this disease, were it necessary, all presenting the same appearances, and cured by the same means, but in very few has treatment been attended with the same happy results in the ear previously affected as in this case. Generally only one ear is affected at a time, but sooner or later the other usually becomes engaged. I feel convinced that many cases of incurable deafness have arisen from this disease.

III. CHRONIC MYRINGITIS, WITH OR WITHOUT INFLAMMATION OF THE TYMPANUM.

By referring to the table of aural diseases published in the former part of this Essay (vol. iv. page 392), it will be seen that this is a very frequent cause of deafness, eighty-two cases having been recorded out of 709, or nearly one in nine of the whole. Indeed, I am inclined to think that it is even of more frequent occurrence; as although many cases present themselves as such in the beginning of the deafness, the appearances of chronic inflammation of the drum are to be found as the sequelæ of nearly all the other forms of inflammation, in the same way that we find chronic ophthalmia so frequent a consequence of the various acute forms of inflammation of the eye. This disease presents under two forms; the first, a perfectly painless deafness; the other attended by paroxysms of violent pain, coming on at intervals, between which the patient is perfectly free from all uneasiness. The latter is much more

common among females from 15 to 30, and is at times accompanied by irregularities of the uterine functions. The appearance of the membrana tympani is too peculiar to be mistaken. It presents a general thickening and opacity, particularly of its lower portion, besides which there is almost invariably a number of spots, about the size of pin-heads, of greater density than the rest, and of a pearly lustre, studded over the surface of the membrane. In many cases it presents the appearance of crumpled parchment. During the quiescent periods, we only remark a few straggling vessels, carrying red blood, spreading over the surface of the membrane, and, for the most part, coursing from above downwards, parallel with the handle of the hammer. Upon any provocation, however, such as cold, or other exciting causes, the membrane will, in a few hours, and often without any increase of pain, become of an uniform dark red colour, precisely like *pannus* of the cornea, a disease of which it is the manifest analogue. The greater the amount of thickening and opacity, the less will be the quantity of vascularity and redness which the membrane is capable of assuming, as we perceive in cases of dense opacity of the cornea, owing, no doubt, to the greater quantity of deposit obstructing the flow of red blood, by diminishing, and, perhaps, also obliterating the caliber of the vessels.

Cases of this kind are often of many years' standing, and many have, I am convinced, been treated as instances of "nervous deafness." The following is no imaginary case, but one of constant occurrence.

A lady, aged between 30 and 40, consults a practitioner in aural surgery. She is very deaf, speaks in a loud, inharmonious voice, and has suffered from noise in her ears, of all descriptions, for several years. She usually prefaces the detail of her symptoms (which is generally very long and verbose) by stating that she does not think much can be done for her, for that she is labouring under *nervous deafness*, and is, therefore, incurable. She has a great objection either to be questioned

or to have her ears examined until she has made a full statement of her case; and as she has had a great variety of opinions, and has used all manner of remedies, she is tediously accurate in her account. She states that she has been deaf from a very early period; that at first her deafness was attributed to inattention, and endeavoured to be remedied by the means thought most advisable by her guardians and governesses; that, her deafness increasing, she was brought, when about ten or twelve years of age, to an eminent practitioner, who, after a few casual inquiries, told her friends not to mind it, for that she would certainly grow out of it as she grew up, and that probably all her deafness would disappear about the period of puberty; but that she might rub *eau de Cologne* on the jaw occasionally! With the exception of sea-bathing, and means calculated to improve the state of her general health, no other remedies were tried, and no other advice sought for two or three years; when, not finding the hearing improved, but gradually becoming worse, and the tinnitus increasing as she grew up, a special aurist was consulted, who stated the disease to be entirely local, and curable by local remedies alone. During the next few years various means were had recourse to; catheterism of the Eustachian tube was employed for several months, the tympanum constantly washed out, and various liquids and gases injected into it, but without effect. Counter-irritation was next employed, with issues in the arm and setons in the neck, and a long and fair trial given to their powers. It was next proposed to remove the tonsils,—and in several such cases they *have been* removed, or, at least, portions of them. Still the disease progressed. Drops, oils, and liniments, some of the most caustic nature, were without mercy, and without discrimination, poured into the external meatus, by those who

> "Stole
> With juice of cursed hebenon in a vial,
> And in the porches of *her* ears did pour
> The leperous distilment."

Broken down in health, wearied by the variety of opinions and the multiplicity of applications, an eminent physician was then consulted, who, having heard the history of the case, advised the cessation of all local remedies, and recommended tonics and antispasmodics, together with shower-baths, change of air, and sea-bathing: stating at the same time that the disease was entirely constitutional, and of a *nervous* character. And certainly by this time, from hope deferred (for many specious promises of cure had been made), from the increase of the tinnitus, and from the effects of the long and severe treatment, the patient had become remarkably nervous and irritable, brooding over her malady, and rendered unhappy and discontented by being unable to take part in any general conversation.

Some years now passed without her doing anything; she had not become much worse, but she certainly had not improved. Owing to some new theory being started, at the solicitation of friends who had been relieved of some curable form of deafness, or from the celebrity of some particular practitioner, she was again induced to seek relief; and having arrived at the metropolis, she took the round of the doctors and aurists. Some proposed perforation of the drum, others recommended travel; the honest prescribed nothing; the quack proffered his panacea, or offered to sell his peculiar acoustic instrument, and backed the recommendation of its merits by the sign manual of some of the judges of the land(*a*). The homœopathists and hydropathists were each consulted, and the merits of their systems tested; the spas of England and the Badens of Germany were visited, and their efficacies tried. Electricity, galvanism, and electro-magnetism, were also had recourse to, but in vain. The opinions of those whom she had consulted were as various as the remedies they employed: but the greater

(*a*) In a window in the Strand, not far from Somerset House, may be seen, framed and glazed, a certificate from one of the Chief Justices of England, lauding, and recommending to all whom it may concern, a particular form of ear trumpet!

number believed it to be a constitutional or nervous affection. Latterly she had been content to look out for "cures" among the newspaper advertisements, and of these she possessed a large number in her portfolio.

Of such cases, scarcely differing in a shade, I possess the notes of several. In many of these the following may be gleaned upon a careful examination. The membrana tympani will be found thickened, opaque, and slightly vascular, and sometimes very much collapsed or drawn inward towards the inner wall of the tympanum, so that the handle of the hammer forms a manifest projection. The membrane has also lost its polish and become of a dull pearl colour. On questioning the patient closely, it is acknowledged that constant attacks of *earache* were suffered several years previously, particularly in winter, and that such attacks were often preceded or accompanied by stuffing in the nose, and symptoms of catarrh, and were generally induced by cold, to avoid which the head was usually kept warmly muffled during such seasons.

In such a case our art at present does not offer much hope. The whole train of symptoms are evidently the result of slow chronic inflammation, affecting, in all probability, the lining of the cavity, as well as the membrane of the drum. The only means which can with safety be recommended at this period is the application of a solution of lunar caustic, applied with a camel's hair brush, every third or fourth day, upon the surface of the opaque membrane, while it is fully exposed to view, and should there be much vascularity present, the application of a few leeches as far in as possible round the meatus, at least twice a week. In a few cases the Arnica will assist to remove the tinnitus; but it is not so efficacious in this as in more recent forms of the affection.

In the cases of periodic pain, with a higher degree and more generally diffused vascularity, the application of leeches, applied every second or third day, will be found most effica-

cious; at the same time that the patient should be brought under the gentle influence of mercury, and kept so for at least a month. Under such treatment, if the case is not of too long standing, the hearing will often be restored, and all the symptoms of pain and tinnitus may be removed. As the symptoms improve, the membrane will clear generally, but in most cases spots of opacity remain indelible. In applying the solution of nitrate of silver with a fine brush, considerable caution and dexterity is required, as the membrane will sometimes present a small perforation the next day if it has been rubbed too hard; and although I have always seen such perforations heal readily, it is an accident which should be avoided. By this application scales of membrane peel off the surface of the part, and leave it thinner and more transparent than before.

There is a form of deafness with which I have been long familiar, which may be the result of some form of inflammation in the membrane of the drum. In such cases, upon bringing the external membrane into view, we do not observe any general thickening or opacity of it, or any apparent alteration of its texture, but a crescent-shaped opacity, about a line broad and three lines long, of a yellow colour, occupies the lower and usually the back portion of the membrane, with a tolerably defined edge, and rather rough upon its surface, closely resembling the atheromatous deposits which occur in the coats of arteries. It is quite gritty, and generally more insensible than the rest of the membrane. It differs from the ordinary opacity, the effect of inflammation, in the surrounding membrane being apparently free from disease, in its almost invariable seat, its yellowish colour and well defined edge, and in its having a portion of unaffected membrane between it and the bony attachment of the membrana tympani; whereas, as I have already remarked, the opacity which results from the ordinary form of inflammation, generally increases in density around its osseo-cartilaginous attachment. By a very slow and gradual process

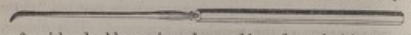
this disease spreads over the greater portion of the membrane, and produces permanent deafness. I am not aware of any remedy for it.

In some instances I have observed a manifest granular state of the membrane, not unlike the surface of a half ripe raspberry, the intervening portions between the reddish elevations being thickened and opaque, but unattended by discharge. In these cases I have procured an uniform thinning and clearing of the membrane, by the occasional application of a fine point of nitrate of silver; but this requires very great care, and should be persevered in for a great length of time, at least two months; it should, if possible, be applied so lightly as not to induce a discharge. Many of those cases are the result of long continued otorrhœa, but which, having healed, has left the membrane in this condition. It must be borne in mind that I am not now describing that form of chronic inflammation which is the ordinary attendant on otorrhœa, and which is the affection to which writers have given the name of "chronic inflammation of the membrana tympani." This disease, which I have been describing, may be the result of any form of inflammation, specific or otherwise.

In cases of permanent thickening and opacity of the membrana tympani, which have resisted all efforts at absorption and thinning, are we justified in performing perforation? I believe in very few cases indeed will it be found efficacious, because the opacity which we *do* see is but a portion of the general thickening and disorganization of the investing membrane of the middle ear, perhaps that of the labyrinth also, which we do *not* see. It may, however, be tried without injury in some cases, but it requires very great caution and dexterity indeed in its performance; and, as irreparable mischief has at times proceeded from its being done in a rough or clumsy manner, I beg to offer a few observations on the safest method of performing the operation of perforation. I wholly discard all the instruments in the shape of punches, trocars, and complicated

apparatuses for the removal of a portion of the membrane, of which several are described as those of Fabrizi, Himly, and others, and figured in works on aural surgery. First, because they all occupy so much space within the speculum that it is not possible, when they are introduced, to see accurately the point of the membrane which they are pressing upon, nor how much of it they are cutting; secondly, by our not seeing accurately the surface on which we are working, it is scarcely possible to avoid injuring the malleus or the chorda tympani, or wounding the inner wall of the tympanum; and, thirdly, because those with corkscrew points, which fix the membrane while the revolving punch cuts out the piece, are not only exceedingly painful, but dangerous, inasmuch as the slightest motion of the head during the operation would produce a degree of violence which might be at once destructive to this delicate membrane.

Having brought the membrane fairly within view, under bright, direct sun-light, I introduce this small, sickle-shaped



knife, with a double-cutting edge, and here figured of the natural size in the blade, but with the shaft and handle about two inches longer; and having made the patient inflate the tympanum, so as to make the membrane tense, and pressed outward, I gently introduce the point of the knife into its lower, thin, vibrating portion, and, drawing it downwards and forwards, make a simple incision of the membrane, about a line and a half in length. So simple is this, and so little pain does it give, that the patient has often been unconscious of its performance until made aware of its completion by the air rushing out through the aperture. In about a minute a slight oozing of blood takes place from the edges of the aperture, like that which follows a wound of the sclerotic with an ordinary broad cataract needle, and if left in this condition it would soon heal up; therefore, a very fine probe, fixed in a handle, and slightly pointed with nitrate of silver by being immersed in the caustic when heated to fluidity, should be immediately passed down into the perforation, the edges of which are thereby cauterized and prevented adhering; and this latter process should be repeated from time to time, as often as the wound shews an inclination to heal, and until we establish a sufficiently large elliptical opening(a).

IV. STRUMOUS INFLAMMATION.

This is a frequent affection in young persons, and, I believe, a very constant cause of deafness in after life. Its subjects are always from three or four years of age to 15 or 16. It

(a) In the month of March, 1846, Dr. Butcher, of this city, read a paper before the Surgical Society of Ireland, on the subject of Perforation of the Membrana Tympani, with a view of shewing the ill consequences resulting from the performance of that operation. He related the cases of two young persons, a man and a woman, in both of whom it would appear that death ensued from puncturing the membrana tympani. Where fatal consequences are said to result from an operation which heretofore has proved, to say the least of it, innoxious, it is of very great importance that we should inquire into all the circumstances attending these cases, and the mode of performing the operation. The first instance was that of a young woman, deaf in both ears for four years, the only history of whose case is, that prior to this period she got a severe cold, with a swelling of the glands of the neck; but what was the cause of her deafness, how it arose, what was the condition of the membrane tympani, why the operation was performed, in what manner, by whom, or with what instrument, we are not informed; all we know is (I quote from Ranking's Abstract), that "catheterism of the Eustachian tube was performed and said to fail; hence it was agreed upon that the membrane of the tympanum should be pierced, a small piece being drilled out of the membrane of the right side;" but we are not told any other circumstances attending the operation, nor who witnessed it. Pain and other evidences of inflammation in the ear ensued, and profuse discharge took place, but what the condition of the ear was we know not. At the end of four months she died, with symptoms of diseased brain; and upon examination it was found that the dura mater covering the petrous portion of the temporal bone was roughened and softened in its texture, particularly near the internal auditory foramen. The membrana tympani was *entirely destroyed* and the lining membrane of the tympanum thickened and villous. Now, while we are totally in the dark as to what the condition of this case was originally, it is manifest that some great violence must have been done to the drum of the ear in the performance of the operation.

The second case is equally defective as to the cause of deafness or the

chiefly attacks the light-haired, fair-skined, blue-eyed, and those who exhibit well marked evidences of a scrofulous constitution. Its first symptom is that of deafness, generally attributed to inattention: scarcely a fortnight passes that I do not see a boy or a girl, from ten to fifteen years of age, from some of the public schools, who, having been deaf for the two or three months previous, had been constantly reprimanded for inattention.

Upon examination, however, the tympanal membrane will be found of an uniform pinkish hue, but without either thickening or opacity, at least in the early stages; the auditory passage is dry, but seldom red. There is generally mucous engorgement of the cavity of the tympanum, with thickening and increased redness of the faucial mucous membrane,—a condition which, there can be little doubt, extends through the lining of the Eustachian tube into the middle ear. Enlargement of the tonsils is a very frequent accompaniment; and glandular swellings about the neck not an uncommon appearance in such cases. It is, generally speaking, a painless disease,

appearance of the ear, although the *post mortem* examination was most interesting; all my friend, Dr. Butcher, states, is, that the man was deaf for twelve months previously, and that he then applied to a surgeon, and had his tympanum pierced, but why, or whether with a gimlet or a punch, a trochar or a probe, we are not informed. At first the hearing was improved, but then relapsed; after some time head symptoms set in, and the man died in the course of six weeks. Upon dissection, evident traces of inflammation of the brain and its membranes were discovered; the dura mater in particular, covering the auditory portion of the temporal bone, was rough and thickened, and a small abscess was discovered in the anterior globe of the brain, upon the same side on which the perforation was said to be performed. In this case, however, the original cause of the deafness, namely, a small tumour about the size of a bean, lying on the auditory portion of the seventh pair of nerves, was discovered. This was evidently a case in which the operation never should have been resorted to. Dr. Butcher deserves much credit for making those cases public, but it is much to be regretted that the statement of the surgeon who performed the operation was not obtained, nor the appearances of the ear, both before and after the operation, described.

and but seldom accompanied by tinnitus in the first instance; occasional crackling sensations, gurglings, and sometimes loud reports, are felt in the ear by patients themselves. Catarrh, stuffing in the nose, and great liability to cold in the head, are not unusual symptoms, or rather are attendants; there is no pain on pressure in or about the ear, the throat, the mouth, or the Eustachian tube. Strumous affections of the eyes are not an unfrequent complication, and these, particularly corneitis, which it very much resembles, and also strumous ophthalmia, sometimes alternate with the affections of the ear. The amount of deafness varies from a hearing distance of eight or ten inches with a watch, to total inability to hear a watch applied to any part of the head, or held between the teeth, or even to hear what is said in a loud and distinct voice; and, generally speaking, the amount of redness and vascularity presented in the membrane of the drum is in the ratio of the amount of deafness; but the latter is very variable, and would in many instances appear to be influenced by the state of the atmosphere, being greatest in damp, moist weather. In some cases the redness assumes a dark, damask rose colour, and then we may generally rest satisfied that the entire of the middle ear is engaged. Simple mucous discharge occurs occasionally, and otorrhœa succeeds in the more aggravated cases, as the disease advances, but it need not present at any period of the affection. The constitution is generally below the standard of health; the patient is usually pale, languid, and inactive, with, perhaps, slight loss of appetite, and some dryness of the skin.

The treatment in this disease should be chiefly directed to improve the condition of the constitution, and I know nothing better for effecting this object than the use of bark in its various preparations, conjoined with iodide or bromide of potassium, and, when the inflammation is of a more active character, the chloride of mercury. In the advanced stages, and where there is much constitutional taint evident, with enlargement of the cervical glands, &c., the oleum jecoris will be found most ef-

fectual; but whichever of these are employed, it should be persisted in for a considerable length of time. This is a slow and tedious disease, lasting, even in the most favourable cases, for months, and is liable to relapse, and return again and again. Such patients should, therefore, be carefully watched, and their ears examined at least once a week, while any trace of inflammation remains. A dry, pure, country air will always be found beneficial, and perhaps I should add, a residence by the sea-shore in summer; but, as far as my experience extends, I have always found bathing in the open sea injurious. The warm bath occasionally, appears to be of use. As in cases of strumous ophthalmia, so in scrofulous myringitis, a leech or two may be required occasionally, although depletion is not generally indicated.

As the tongue is usually white and clammy, and the dejections often vitiated, small doses of chalk and mercury, combined with rhubarb and columba, given as alteratives every second or third night, will assist our other means. The diet should be light and highly nutritious, while all acid fruits, pickles, and ill-boiled or stale vegetables should be avoided. Constant open air exercise during the fine part of the day is very necessary; and when the weather is at all harsh, cold, or damp, a light covering should be worn over the ears, or small bits of cotton laid in the concha; but in the house, or in warm weather, these precautions are unnecessary; neither do I believe it at all efficacious to keep the head warmer than under ordinary circumstances.

Locally, counter-irritation will be found most effectual, and I find the vesicating liniments more efficacious in producing the desired effect than the ordinary blistering. As such, the strong tincture of iodine, with acetum lyttæ, or croton oil and acetic acid conjoined with spirit of turpentine, oil of rosemary, and soap liniment, form very useful applications. The liniment should be rubbed over the mastoid process, and lower down, as far as the angle of the jaw, once or twice a day, until

a slight vesicular rash is produced, when its use should be discontinued until the redness has disappeared, and then it should be reapplied as before. This counter-irritation should be kept up for a couple of months at least, varying the application as the parts become accustomed to any particular substance. Whatever substance is used, great care should be taken that it does not spread over the back of the auricle, which is very likely to become inflamed and greatly swollen by it; to prevent this a small fold of linen should be applied between the auricle and the mastoid process after each application. Should pain be experienced on pressing the tragus backwards with the finger, a single leech should be applied either on that spot or within the circle of the meatus, but, generally speaking, local depletion, as I have already stated, is less indicated in this than in any of the other inflammations of the drum or its membranes.

This is one of the diseases in which catheterism of the Eustachian tube is sometimes necessary, but, I believe, not so often as is generally resorted to. When the patient himself can readily pass a stream of air into the drum, by making a forced expiration, and at the same time holding the mouth and nose, whilst we apply our ear, or a stethoscope, to his external ear, so that we can distinctly perceive the full and natural inflation of the membrane, the introduction of a catheter, and the pressure of a stream of cold air, I believe to be not only unnecessary, but injurious. In cases, however, where mucus has collected in the cavity of the tympanum, catheterism should be resorted to occasionally, and even warm water, or some bland fluid, thrown up by means of a syringe, although I have my doubts as to the quantity of any fluid which can be thus driven into the tympanum, in order to wash out mucus, pus, blood, or other extraneous substances. I am aware that in this opinion I differ from many distinguished authorities, and particularly from my friend, Mr. Pilcher, but it is, nevertheless, the result of considerable experience in the management of such cases. As I do not believe that the enlarged tonsils which

often accompany this disease (as they do other strumous affections) are the *cause* of the deafness and the inflammation manifest in the drum and its membranes, I cannot recommend their removal, as has been proposed, and, I believe, acted on by others; but the application of a strong solution of a nitrate of silver to the back of the throat and fauces, and particularly towards the mouth of the Eustachian tube, by means of a piece of lint attached to the end of an aneurism needle, and applied as far up as possible behind the pillars of the soft palate, will be attended with beneficial results; and the use of astringent gargles should be persevered in during the continuance of the throat affection. If otorrhœa ensues, it is to be treated as I have recommended in my former essay upon that subject.

Gout may occasionally attack the tympanal membrane, but I have never seen a case of it myself; instances have been recorded of its exhibiting itself in the auricle. It is stated that gonorrhœa appears sometimes in the external auditory canal, but we still want careful examination and accurate observation to establish these cases.

V. SYPHILITIC INFLAMMATION.

Although practitioners who treat syphilitic diseases upon a large scale appear to be aware of the fact that venereal occasionally causes deafness, I cannot find any authority which has noticed the disease I am about to describe. The deafness which sometimes accompanies the secondary form of syphilis is generally believed to be caused by inflammation and ulceration extending from the throat through the Eustachian trumpet into the middle ear; such may, under certain circumstances, no doubt, occur, and produce destructive inflammation and suppuration in this cavity, although I have never met with such a case myself, nor have I seen a well authenticated instance of it recorded. The English writers upon aural diseases have completely omitted syphilitic affections of the ear, as have also Kramer, Schmalz, and most of the continental writers, with the exception

of Lincke. Martell Frank, the last writer of note, in his *Practische Anleitung*, enumerates two forms of the disease,—the first, external syphilitic otitis, in which secondary syphilitic ulcerations occur in the auditory canal, accompanied by other well-determined symptoms of the disease. These, however, are already known to the surgeon; they resemble the ulcerations which occur on the margins of the tarsal cartilages, and are sometimes the consequences of rupia seated upon the auricle, in the vicinity of the meatus. Under the head of otitis interna, he describes that form which is the result of lues, which, he says, arises either as a reflex of the disease in the ear itself, or is propagated through the Eustachian tube, as an extension of inflammatory action in the throat. He says this disease is accompanied by great pain, and often terminates in suppuration of the middle ear, destruction of the tympanal membrane and the ossicula, caries of the temporal bone, profuse otorrhœa, and exfoliation, &c. It is evident, however, from his description, that the disease of which he speaks is the ordinary suppuration of the cavity of the tympanum, with neglected otorrhœa and caries, and in no wise characterized by any peculiar syphilitic symptom.

Lincke's usual accuracy and observation seem to have deserted him when writing his chapter upon "Otitis Syphilitica;" for, while the affection now under consideration seems totally to have escaped his observation, he has, with most laborious German assiduity, collected together a multiplicity of authorities bearing upon the subject of what are supposed to be syphilitic diseases of the ear, but not one of which he himself has verified. Thus, he enumerates from the works of Cullerien and Plisson chancres both on the auricle and in the meatus. He also gives a description of chancres, "if they arise near or *on* the membrana tympani!" but, like Frank, his descriptions are chiefly in reference to the syphilitic otorrhœa, the result of inflammation and ulceration extending from the throat or nose, a disease which it yet remains to be proved, by

original observers (not system-makers or cyclopædia-compilers), at all exists.

While Lincke's work, *Handbuch der Theoretischen und Praktischen Ohrenheilkunde*, must ever remain a most valuable book of reference, it is high time for those who wish to advance the science of aural surgery to cast off the incubus of authority, and by patient investigation and originality of observation establish facts. Kramer deserves much more credit for omitting all notice of an affection which it is evident he had never himself observed, than those writers who, with equal want of knowledge, have endeavoured, by collecting out of a variety of obscure writers some ill-recorded cases, to establish an untenable theory.

The disease which I am about to describe is an inflammation of a specific character, occurring in the membranes of the tympanal cavity, but chiefly exhibited in the external membrane of the drum. All the cases I have seen of this affection occurred in young men, and generally those of fair complexions and blue eyes, who had had primary sores upon the genitals from six to twelve months previously, which sores were rather of a deceptive character, so that mercury was seldom given in the first instance, at least in a legitimate form. These sores were usually tedious in healing, and followed by papular eruptions and sore throats, for which mercury was, in most of the cases, taken irregularly. Buboes were not a common attendant, nor had iritis ensued in any of the instances of well-marked venereal myringitis which fell under my notice; but copper-coloured blotches, fissures, and ulcers of the tongue, with loss of strength and slight nocturnal pains, generally speaking, existed previous to the aural affection, which should, I think, be ranked as a tertiary symptom. In four cases out of five of this disease which I witnessed last year, the disease appeared suddenly, as an eruption was fading off; in the fifth it came on at a later period, and was accompanied by loss of hair; in all it appeared in the upper

or middle ranks of life. In some cases there is at first a sensation of fulness in the head, and often vertigo upon stooping or rising up suddenly, and the patients have usually a feeling of fulness within the ear; but in no instance have I seen it accompanied by acute pain, in which circumstances it resembles the subacute form of inflammation already described at page 83, but upon inspection the amount of redness and vascularity will be found very much greater than the latter; and in this consists one of the chief characteristics of this disease, that while it is unaccompanied by local pain, as in the subacute inflammation, the membrana tympani will be found to present an amount of redness equal to, and sometimes exceeding, that seen in acute myringitis. The redness has generally, however, a brownish hue in the syphilitic form, which is not observable in that just alluded to. There is not, at first, much loss of polish, but in a short time the membrane assumes a fuzzy appearance. The auricle and meatus I have not seen affected more than in the subacute form; both ears are usually affected at the same time. The amount of deafness is usually very great, and is the symptom that first attracts the patient's attention, and it seldom varies. Tinnitus is not usually present, but in two cases which I possess the notes of the deafness was ushered in by a very loud noise, which passed away after a few days. This inflammation does not end in mucous or muco-purulent discharge from the surface of the membrane, or the sides of the auditory canal; nor have I seen lymph effused upon the external surface of the membrane, as in the more violent and painful forms of otitis; but from the *brownish*-red colour of the membrane in the early stage, from a yellow-speckled opacity, which is generally observable in it on the subsidence of the redness, and from the intense degree of thickening and opacity which were present in some cases, which were evidently the result of syphilitic myringitis, I am inclined to think that lymph is largely effused between the laminæ, or upon the inner surface of the

membrana tympani. Two of the worst cases of deafness (not congenital) I ever saw, appeared to have been the result of syphilitic inflammation, and in both there was great thickening, opacity, and insensibility of the membrane. I am also inclined to think that syphilis has played a more extensive part in the production of deafness than the profession is at all aware of.

Case VI.—*Syphilitic Inflammation of both Tympanal Membranes; Mercurial Treatment; rapid Recovery.*

Mr. A. B. had a doubtful-looking sore upon the penis, twelve months previous to my seeing him in October last. Considerable doubt was expressed as to the genuine syphilitic character of the sore. It healed under local treatment. Some months subsequently he had a bubo in the right groin, and a small abscess also formed on the under side of the urethra, he then rubbed in mercury, and was confined to the recumbent posture until the swelling in the groin had completely subsided. After this he experienced great weakness and lassitude, and suffered for several weeks from sore throat. These symptoms were relieved by removal to the country; but on his return to town, an eruption appeared extensively on the genitals, thighs, and abdomen, and he had also some slight deafness. These symptoms were relieved by the use of the hydriodate of potash. The eruption, however, came and went, both on its original seat and on the chest and extremities, during the next few weeks. I first saw him, with Mr. Evans, in the middle of October last; he had then no sore throat, but a fresh crop of eruption, in the form of brownish spots, interspersed with small pimples, had appeared generally over the back and the outer sides of the arms. He had also become exceedingly deaf, hearing the watch only when pressed against the auricle, and he complained of a sense of giddiness and fulness in the head, but had no pain whatever in the ears, nor any snuffling in the nose. He stated that his deafness had occurred suddenly, a few hours after rising in the morning, some days before; he had had some noise at

the commencement, but it had now nearly vanished. Upon inspection, the auditory canal was found dry, and the membrana tympani of an uniform dark, brown-red colour, so that the situation of the hammer bone was not easily recognizable. There was no ulceration observable, nor any alteration in the plane of the membrane; but the light was not reflected from it in the ordinary manner, thus shewing that it had lost its polish. These appearances were nearly the same upon both sides. He was able to inflate the drums perfectly, and auscultation afforded no evidence either of contraction of the auditofaucial passages, or of any accumulation of fluid within the drums.

The treatment consisted in the application of leeches round the meatus every second day, and the use of calomel and opium in small and frequently repeated doses. This mode of administering the mineral disagreeing, having produced diarrhœa and great tenesmus, we were obliged to discontinue it, and substitute inunction in its stead. The deafness and the appearance in the ear remained unaltered until the morning on which salivation was produced, and then hearing was restored almost miraculously, and the next day the redness and vascularity in the ears had almost disappeared. Gentle ptyalism was kept up for some days longer. He has not since had any return either of the deafness or other syphilitic symptoms.

I attended a case with Mr. Cusack two years ago, in which it was found necessary to keep up the mercurial action for above a fortnight, but in this instance the disease had been of a much longer standing. I treated a well-marked case last summer in consultation with Mr. Mason, in which several relapses occurred, just as we often observe in syphilitic iritis.

VI. FEBRILE SUBACUTE INFLAMMATION ACCOMPANYING THE EXANTHEMATA AND OTHER FEVERS,—GENERALLY PRODUCING OTORRHŒA.

Although, in forming a classification of inflammations of the tympanal membrane, it became necessary to introduce the fore-

going heading, it is unnecessary for me to here describe those aural affections which accompany the exanthemata, as being always accompanied by purulent discharges, I have fully detailed their symptoms and treatment in one of my former Contributions to Aural Surgery,—the essay on Otorrhœa. Moreover, I am not at present able to state from personal knowledge what are the peculiarities of the inflammation which precedes the discharge in those cases; as, although of very common occurrence, the practitioner in aural surgery does not in general see them till long after their first appearance,—seldom, indeed, till the disease becomes chronic, and complicated with polypus; or often not till long after ulceration has destroyed the membrane, the ossicula have been discharged, and other irreparable mischief has occurred. During the recent epidemic of influenza I have had some opportunities of examining the membrane in the early stage of this affection, and I have found it dark-red, thickened, and very pulpy, like a highly injected portion of the intestinal mucous membrane.

In the foregoing essay I may to some have appeared prolix, but on a subject comparatively so new in English medical literature, so little studied, and, consequently, so little understood, by practitioners in general, it was impossible to explain my meaning without entering into minute descriptions. If aural diseases were as attentively studied in these kingdoms as ophthalmic or obstetric medicine, then would the lengthened description of cases be unnecessary; but where do we find, throughout the whole circle of our periodical literature, half-a-dozen well observed and accurately noted cases of diseases of the ear in a twelvemonth? Faithful observation and clinical records of disease are now more required in this than any other branch of medical science.

THE END.

Looking at these great works, without being in a condition to comprehend the steps which led to their establishment, the effect has been similar to that which might be produced by magic, on the public mind of England. It has been said, that wonder is the effect of novelty upon ignorance: and there being presented on every hand monuments of the triumphant efforts of intellect and genius, the astonished and ignorant stand agape, and are ready to receive the advances of every charlatan who promises a new wonder. Such, it appears to us, is the explanation of the extraordinary gullibility daily manifested by the British people, a gullibility of which there is a numerous tribe of native and foreign knaves always ready to take advantage.

We have been led to these reflections by a perusal of the document, the title of which is given at the heading of this article. This paper, which is published by order of the House of Commons, and at the national expense, in this year of great monetary depression, purports to contain copies "of any letters or reports received by the Chief Commissioners of Woods and Forests, from *Manchester*, *Liverpool*, and *Ireland*, on the Efficacy of Monsieur Ledoyen's Disinfecting Fluid." It opens with a letter to Lord Morpeth, signed by "Ledoyen," and "A. C. Calvert," calling his Lordship's attention to "a statement of the different objects to which M. Ledoyen's process can be applied with success;" moreover, professing that the writers "have no sordid views;" that they "wish to avoid, if possible, being forced to form a company, and make it the traffic of speculators;" and ending with a "hope to find in your Lordship that which your Lordship is so well known to possess, benevolence and charity to all men." Then comes the "statement," in which it is said that "M. Ledoyen, chemist of Paris, and Mr. F. C. Calvert, professor of chemistry, late of the Garden of Plants at Paris, and pupil eight years of Monsieur Chevereul, at present lecturer at the Royal Institution, &c., at Manchester, have discovered the means of disinfecting all fœtid animal substances and gases by a liquid which is very cheap, simple, and can be applied by any person with the greatest facility. It disinfects night-soil, not destroying, but increasing vegetation, more particularly as regards agriculture, completely preventing the disease in potatoes, when the land is manured with disinfected night-soil. It disinfects hospital-wards of miasma; also cellars, water-closets, and buildings infected by impure gases. It disinfects sailors suffering from fever on board of vessels; it will also disinfect ships at sea, and under quarantine. It disinfects patients suffering with infectious disorders and wounds, also dead bodies, so that they may be kept

nearly a month; also different parts of the body can be kept for the purposes of dissection, for coroners' inquests, &c."

It may easily be imagined the delight which this communication must have produced in the bosom of the First Commissioner of Woods and Forests; it was a mare's-nest of the greatest promise; it offered a panacea for all the ills that burden her gracious Majesty's advisers. Are the potatoes threatened,—here is a prophylactic; does fever rage throughout the land,—here is a magic scarf which, moistened with "the liquid," and waved through the wards of an hospital, immediately cures all the patients; are the higher classes fearful of impending contagion, vases of "the liquid," rose-scented, and distributed through the apartments, will, by their protective influence, dispel every uneasiness; is a Health-of-Towns Association tormenting the First Commissioner, what an agreeable means of propitiating its members, growling at the postponement of their bill, will be the present of a liquid, cheap, simple, and easily applied, which is capable of removing every odour, no matter how unpleasant. No fear of another Boa Vista catastrophe; the decks need only be washed with a few gallons of "the liquid," and infection becomes impossible. We declare that we do not in the slightest degree exaggerate the promises which Messrs. Calvert and Ledoyen hold forth. They say that their discovery is capable of preventing the potato disease, curing fever, destroying contagion, and removing all disagreeable odours. Is it any marvel that Lord Morpeth should direct his secretary to acquaint Colonel Calvert that he had—

> "Prevailed upon Dr. Southwood Smith, Mr. Toynbee, and Mr. Grainger, to witness and test any experiments which he may submit to them, having for their object the disinfection of dead bodies, ulcers," &c.

Yet, Lord Morpeth ought to have hesitated before he gave the sanction of his name to an investigation of professions so profuse: although his Lordship, in common with his order, is probably not very profound in chemistry and physiology, he ought at least to be acquainted with the English language. We suppose he knows the meaning of "infection;" and he should have seen some inconsistency and confusion in the language which spoke, in the same breath, of "disinfecting" a water-closet and a fever patient; of preserving potatoes from the rot, and pickling subjects for dissection.

However that may be, we are next presented with the "Report on M. Ledoyen's Disinfecting Fluid. To the Right Hon. Lord Morpeth, First Commissioner of Her Majesty's

Woods and Forests, &c. By Dr. Southwood Smith, D. R. Grainger, and Joseph Toynbee, Esqrs." According to this Report,

"This fluid does not possess any peculiar power in preserving the dead body from decomposition, and that, therefore, it is not applicable, to any considerable extent, to purposes of dissection: it removes the fœtor of putrefying substances, vegetable and animal, by decomposing the sulphuretted hydrogen upon which that fœtor chiefly depends."

It appears, moreover, from this Report, that this substance converts the volatile ammonia, generated in putrefaction, into a fixed salt, useful in agriculture; but there is at the same time formed a metallic compound, the effect of which on vegetation is confessedly unknown to the Commissioners.

Among the scientific experiments upon which the Commissioners arrived at these results, we beg to introduce one as a specimen:

"We have had an opportunity of trying the effect of this fluid in a sick chamber in a private family. A small quantity was put into a close-stool before the invalid used it. Upon uncovering and emptying the stool only a very slight smell could be perceived in the room, although, on a previous occasion, when the stool was used without the fluid, the stool was extremely offensive."

We again read, that by saturating the bed-clothes with the so-called disinfecting fluid, the laundresses and other persons engaged in the cleansing of such, are, in the opinions of the Commissioners, most probably protected, "and prevented from receiving a shock which is never recovered, even when death is not the immediate result of the attack." But how many cases of painters' cholic and paralysis would follow, the Commissioners have not offered a conjecture upon(*a*).

At page 12 we meet with an omission which certainly appears to us extraordinary in a parliamentary document, and has a savour of quackery, which even a "disinfecting fluid" would not remove. The passage we allude to runs thus:

"M. Ledoyen's disinfecting fluid consists of ————————————; the action of this preparation is to decompose sulphuretted hydrogen," &c.

Who directed this omission?—the reporters or Messrs.

(*a*) This fluid has been examined by Dr. Aldridge, and found to be a solution of nitrate of lead. Sir W. Burnett has introduced the chloride of zinc for similar purposes in the navy.

Calvert and Ledoyen; the printer's devil, or the Viscount Morpeth. So much for the facts arrived at in the Report before us. Let us now see what substances are capable of destroying the odour of sulphuretted hydrogen, and forming a fixed salt with ammonia. We shall give a list of many such:

Sulphate of copper.	Nitrate of silver.
Nitrate of copper.	Chloride of gold.
Chloride of copper.	Protochloride of tin.
Super-nitrate of bismuth.	Perchloride of tin.
Nitrate of lead.	Nitrate of mercury.

We can assure Lord Morpeth that a solution of any one of the foregoing salts will produce the effects attributed in the Report to M. Ledoyen's disinfecting fluid; they will be found all equally effectual; and it therefore comes to be a mere pecuniary question which of them ought to be preferred. It is plain that, however wonderful the disinfecting nostrum may be to the inhabitants of Cockaigne, it is really no secret to the scientific world.

There is not a word of evidence in the document before us as to the influence of this solution of nitrate of lead in curing, or "disinfecting," as they call it, by its vicinity, fever or other infectious diseases. Of course, no professional man (except Dr. Southwood Smith) could bring himself to support such an absurdity as that would amount to. With respect to the potato disease, Dr. Smith has been even less guarded. He manured portions of his garden with his disinfected night-soil, and finds that potatoes grown on these spots are finer than elsewhere. He says: "I have this day had specimens of them examined by Mr. Alfred Smee, who pronounces them to be at present perfectly healthy." What! not a single aphis vastator! Oh, genius of humbug! how numerous are thy votaries. Truly, successful speculation constitutes the idolatry of this age, and the wonder-workings of pseudo-science its superstition.

Before we conclude this article we have a few plain words to say, and we will speak the more plainly, because it is evident that the upper and middle classes are extremely ignorant of all that relates to life and health. Well, then, in the first place, a disagreeable odour does not constitute infection, although a stink may, under certain circumstances, afford a valuable index to infection; thus, in the wards of an hospital, if the medical attendant has his sense of smell unpleasantly assailed, it is a signal that ventilation has not been sufficiently attended to, and he can, accordingly, order this neglect to be

remedied; but if the caretakers of the ward have at their disposal an agent for conquering this stink,—a liquid, which, upon being poured into the chamber-vessels, or sprinkled on the ward, will remove all unpleasant effluvia,—then the safeguard afforded by the senses becomes nugatory: the unpleasant odour is removed, but the contagious poison continues and accumulates. It is like taking away the beacon, while the rock remains. Such a substance may lessen the trouble of the night-men and wardsmen, and dissecting-room porters, whose eulogistic testimony to the value of M. Ledoyen's fluid, is published by the House of Commons in the paper before us, but we feel persuaded that its employment would prove very injurious in practice.

We have another observation to make, and that in a very serious spirit. The facts are these: the originators of this *imposture*, we can give it no other name, came over to Dublin avowedly under the patronage of Her Majesty's Government; they sent round a circular to officers of the municipality, professional men, &c.; they asked for inquiry: this was responded to. They were treated with hospitality, became intimate in families, were furnished with testimonials by some few, and subsequently corresponded with by others with whom they had formed acquaintance. What will it be thought of by our readers, when they are told that these private letters, containing domestic details in some instances, remarks on friends which would not bear to be repeated in others, are published in this paper ordered to be printed by the House of Commons. We could not expect better from a vulgar cockney; but, certainly, we think that Her Majesty's Government should not present, nor the House of Commons order to be printed, documents of such a nature, without suitable supervision. From a dislike to becoming the medium for propagating petty scandal, we refrain from quoting portions of this Report which fully bear out our assertion.

We have had occasion in this article to blame various parties, but are anxious that we should not be misunderstood. We think Lord Morpeth has acted without consideration in this transaction, but we do not, on that account, forget his noble nature, or the services which he has rendered to our country. Dr. Southwood Smith we believe to be sincere and well-meaning, although rather crotchetty, and somewhat enthusiastic.

Let us now briefly pass in review some of the evidence detailed in this precious document—some of the "Letters and Reports received by the Chief Commissioner of Woods and Forests,"—set forward in a parliamentary folio, gravely ordered

to be printed by the British senate, and, consequently, paid for by the country. Always premising that we do not deny to this, in common with many other chemical substances, the power of destroying some unpleasant odours, or, to deal more in the phraseology of the Report, *stinks*. But against the disgraceful quackery with which this book abounds,—a quackery not equalled by the most offensive and indecent advertisement,—and the humbug of presenting such a book to the country, we loudly and strongly protest. Let it be remembered, moreover, by every Irish practitioner, who risks, and has for years risked his life, and devoted his time, talents, knowledge, and energies to his country's service, that, while his just and respectful *claim* has been scouted by the authorities, these adventurers have been patronized and fostered, introduced and lauded, and their productions printed and paid for out of the public purse!

We have already alluded to the circumstance that this imposture has been attempted to be bolstered up by the testimony of night-men, dissecting-room porters, ward-men, and other respectable authorities of a similar kind. Some of the experiments made by these intellectual and educated individuals may amuse our readers, as they have doubtless enlightened the House of Commons. Speaking of the contents of a privy:

"William Fenwick did, as you gentlemen saw, *taste* it, and William Dyer put some over his eyes without injuring them: if it had not gone through your process, it would have *blinded* him!!"

We cannot, however, pursue a strain of levity when we come to examine the part which a physician of repute in London has taken in this transaction. Dr. Southwood Smith, not content with bearing his share in the fooleries of the Report already spoken of, volunteers his individual testimony as to the efficacy of this fluid in obviating contagion among the medical and non-medical attendants on the sick:

"Whatever difficulties," he writes, "your Lordship may have encountered in obtaining the necessary powers to make even any commencement of a system of prevention by the removal of the causes of fever, you have in your own hands, and have had for some months, the sure and certain means of preventing the extension of fever to the immediate attendants on the sick."

And again:

"That, by means of this agent, medical men, who are always in imminent danger, and who so often suffer, might perform their arduous duties with perfect security."

Can it be believed that a nobleman of such acknow-

ledged philanthropy can be, in common with a member of the Royal College of Physicians, in possession of a secret which, if made known, would now stay the pestilence in our land, and that they churlishly withhold it! Will they not afford one drop of this healing liquid to the poor Irish physician?

In the columns of newspapers, in the pages of journals, on the covers of magazines, in the corners of railway guides, placarded on dead walls and bankrupts' shop-windows, dropped into the hat at public meetings, thrust into the hand in streets, and forced upon the attention at every turn, we thought all the modes of puffing quack advertisements, and indecent labels, either in prose or rhyme, had been exhausted. But we find that we were mistaken. A novelty in this department has been introduced by Colonel Calvert; and in the pages of a parliamentary report we see puffs as gross, and language as indelicate, as any that disfigure the lowest newspapers. Let us take a few examples:

PARLIAMENTARY REPORT.

"Mr. Sankey, the resident medical officer of the Fever Hospital, will feel obliged by Mr. Davis sending five gallons of M. Ledoyen's disinfecting liquid."

"Will you have the goodness to send to Mr. Davis, at Colonel Calvert's, Deptford, as we have, unfortunately, lost the address, for five gallons of your disinfecting liquid, for the use of the hospital.

"I have, &c.

"(Signed) F. BURTON, M.D.

"*To M. Ledoyen.*"

"We, the workmen employed by Mr. Radford, nightman, to empty a cesspool of night soil yesterday, at Mr. Eldertons, Brixton, feel it our duty to return you our thanks for your kindness to us, and to express our astonishment at the discovery of the French gentleman.

QUACK ADVERTISEMENTS.

"I wish to have another box and a pot of the ointment, in case any of my family should require either.

(Signed) "ALDBOROUGH.

"*To Professor Halloway.*"

"SIR,—Send me a 4*s.* 4*d.* canister of your snuff, called 'Grimstone's Eye Snuff;' let it be the same sort which Lord Liverpool received from your house in the Strand.

"Your obedient Servant,

"G. CANNING.

"*To Mr. Grimstone.*"

"When I commenced the use of your pills I was in a most wretched condition; and, to my great delight, in a few days afterwards, there was a considerable change for the better, and by continuing to use them for some weeks I have been perfectly restored to health, to the surprise

We beg you to accept our best wishes, and may you long live to do good.

(Signed),

"W. FENWICK.
"JOHN DOBSON.
"CHARLES COOKE.
"WILLIAM DYER."

"SIR,—I, Daniel Kearney, attendant of the foul dysentery ward in North Dublin Workhouse Union, declare that, before you came, the stench of the ward was so intolerable that I could scarcely remain in it for a few minutes; but that since you and the French gentleman gave us your liquid the ward has been completely free from stench; that myself and the patients are much healthier, and there have been no deaths in the ward; and that the air of the ward is now pure and clean.

(Signed),

"DANIEL KEARNEY.

"*Colonel Calvert.*"

"*Madam Stevens's Hospital,*
"*Dublin.*

"SIR,—In compliance with your desire, I have the honour to address you, and feel much pleasure in acquainting you that the patient, M'Dermott, No. 11 ward, is able to be out of bed for the last few days, which I am of opinion is owing chiefly to your instrumentality, as without the application of your invaluable discovery it would not have been in my power to pay that attention which has conduced to his present improved condition; of his ultimate recovery I make no doubt whatever. The discovery of all who have witnessed the state to which I had been reduced by the disordered state of the liver and stomach. Would to God that every poor sufferer would avail himself of the same astonishing remedy.

(Signed)

"CHARLES WILSON."

"He had severe hectic fever, the urine depositing large quantities of sediment; constant, distressing cough; no appetite, and the stomach rejecting nearly everything he took, both food and medicine. He began by taking five of your pills night and morning, which were gradually increased to ten, which in a short time had the effect of completely curing the cough, the stomach affections, and restoring the urine to its natural state. His strength and flesh are also restored, and his appetite keen and digestion good.

(Signed),

"ROBERT CALVERT."

"(*From the Right Hon. Lord Elphinstone.*)

"Mr. Eisenberg having asked me for a certificate, after six months' experience of his skill, I have no hesitation in giving it, his treatment having been perfectly successful.

"ELPHINSTONE."

will, no doubt, be estimated by society.

"Certified this 15th June, 1847, by me.

"(Signed), DANIEL O'BRIEN(*a*).

"*Colonel Calvert.*"

We think it right to put our readers in possession of the mode in which some of the testimonials printed by order of the House of Commons have been obtained, and, at the same time, acquaint our readers with some of Colonel Calvert's proceedings in Dublin. Colonel Calvert states that he received certificates from "Sir William Crampton, Bart., physician; Mr. Carmichael, surgeon; Dr. Frederick Kirkpatrick, M.D., physician to the North Union Workhouse,—and George Brown, resident apothecary; Sir Henry Marsh, Bart., physician,—and Mr. Cusack, surgeon; and Charles Fleming, M.D." With even the names of some of the foregoing we are not acquainted.

Besides the experiments performed in presence of the surgeons and physicians of hospitals, several of whom refused to bear testimony to the efficacy of his fluid, or to sign the documents laudatory of it placed before them, the gallant Colonel availed himself largely of the extensive experience and profound medical knowledge of the nurses in hospitals, and the pauper patients in Union Workhouses, who supplied him with their testimonials, in return for————————————(*b*), in addition to sundry complimentary communications. Daniel Kearney, whose testimonial we have already quoted, is a pauper in the North Union Workhouse, where he holds the situation of ward-man. Without the knowledge of any of the officers of the institution, Colonel Calvert and his secretary procured from this man the document referred to, in which Kearney states that, previous to the use of the disinfecting liquid, he could scarcely remain in the ward for a few minutes, although the fact is, he had actually slept in it for months previously. Daniel Kearney is, however, communicative; and the Colonel wishes, it would appear, to cultivate his acquaintance, as we learn from the following document, addressed to him by the Colonel after his departure from Ireland. In a matter of this kind no apology is necessary for its insertion. We procured it by the same

(*a*) Daniel O'Brien is a nurse or ward-man in Dr. Steevens' Hospital. Why did not the medical attendants of the hospital sign the document?

(*b*) Our readers will perceive, at p. 4, that we have parliamentary precedent for this blank.

means, we dare say, that Colonel Calvert obtained its answer, and the certificate.

20th June, 1847.

"KEARNEY,—I have been anxiously waiting, expecting a letter from you every day, letting me know how your sick men go on, and if my old friend Keough (I do not know how to spell his name) is getting better. Does he take his snuff? Are the young men out of the ward? Let me know all about it. *Do you make use of the liquid?* Is the ward quite clean, and clear of smell? Remember me to my old friend, and all the others. Ask the old man if he is nearly ready to dance the jig, as I intend coming to Ireland on purpose. I render you great justice that nobody can be more attentive, and do more justice to the sick, than you do; and if the liquid did any good, it was owing to your always taking care to keep it constantly used, and I attribute all the success of it to you. I shall be at all times willing and wishing to do you any good I can. Write a certificate of the health of the men since I left; and *write me two or three lines, on another piece of paper, letting me know how you all are*(*a*).

"Believe me your well-wisher,

"A. C. CALVERT.

"*Dover, Kent, England.*"

The reply to the foregoing is too absurd to occupy our pages with.

There are but few other circumstances with which we shall weary our readers. Colonel Calvert has communicated with the Marquis of Downshire, and after what fashion we may glean from the following extracts contained in a letter from that nobleman to him, dated the 22nd of June last:

"I sent your message to him as you gave it to me, coupling Lord Morpeth's permission with your own, in which you kindly said you would be happy to give some of the stuff for the benefit of the poor sick people in Belfast. I now write to you to ask you to be so kind as to send some by as early a period as you conveniently can, and to write your own directions for its use, and *your own change of diet*, which appears to have so wonderfully brought round the sick under your charge in Dublin and Drogheda."

What was the nature of the dietary alluded to in the foregoing paragraph? Who placed the sick in Dublin or Drogheda under the charge of Colonel Calvert?

Colonel Calvert has brought forward certain letters from a few medical men in Dublin, commendatory of M. Ledoyen's fluid. We are in a condition to assert that some of these let-

(*a*) The only liberties we have taken with this letter refer to the punctuation, and the use of italics in the last sentence.

ters were written by himself, and proffered to the medical officers of charities, some of whom signed them, and others refused. We now ask why letters written in a less laudatory strain than those contained in the document before us were not inserted: why was not the following letter, written by Dr. Monahan, a colleague of Dr. Kirkpatrick's, and *received* by Colonel Calvert, and which we have Dr. Monahan's permission to insert, published, as well as those of other officers of the same institution?

"71, *Marlborough-street, June* 4, 1847.

"SIR,—I beg leave to say, that the fluid invented by Monsieur Ledoyen has certainly the property of modifying nauseous odours, but am not at present prepared to say that it is superior to several other chemical compounds recommended for that purpose. I shall test the qualities of all such compounds, and give you the result of my experiments in the course of twenty or thirty days, by your favouring me with your address

"I have the honour to be, your obedient Servant,

"THOMAS LEWIS MONAHAN,

"*Physician to the North Dublin Union.*"

Besides the private letter of Daniel Kearney, given in page 44 of the Report, other communications, of an entirely private nature, not intended by their authors, we are warranted in stating, to be made public, are, as we have already stated, printed by order of the House of Commons;—for example, that of Dr. Kirkpatrick, of the 14th of June, and that of Dr. Eades, of the 23rd. A few specimens of domestic history and private feeling from these will suffice to shew their character:

"In your own ward all the poor fellows remain as you left them: your old friend, Keough, is alive and gaining ground, though he misses your cheering countenance; I do not, however, let him want a pinch to comfort his nose with. The country looks beautiful, and the prospect of a plentiful harvest most cheering: the prices, however, still keep up, and there is a continuance of fever. I have attended myself 350 cases of typhus in the last three months; an occupation I would gladly exchange for that of budding roses in your good company in Normandy. Have you a vacancy for an assistant gardener at present?"

And, again:

"Matters go on in our hospitals as of old, the only change in our inquiries being an occasional question as to 'what has become of the disinfecting fluid; has it died a natural death; and what in the world could a colonel have to do with it? or we enjoy a laugh as we retail one of your merry jeu de mots.'

"I am struggling on as usual; up every morning at five, and in Dawson-street with my class at six; *pour reustir, il faut travailler.*"

Not certain of the effect which the Report might produce, Messrs. Calvert and Co. have induced the Government to publish a Supplement, consisting of letters from Mr. Carmichael and Dr. Macdonnell of Dublin, on the "*anti-bromic*" virtues of the disinfecting fluid, and also a letter from Colonel Calvert to the Secretary of State for the Home Department, in which he states that Mr. Phillips has communicated to him Sir G. Grey's "satisfaction on reading the various papers which have been presented by Her Majesty's command, and ordered to be printed by order of the House of Commons."

We have now finished our disgusting task. We hope it will never again be our duty to hold up to public reprobation another such example of ignorance and quackery patronized by power.

ART. VI.—*Observations on the History of the Cure of Popliteal Aneurism by Compression.* By THE EDITOR. With Cases by the late CHARLES H. TODD, Professor of Anatomy and Surgery to the Royal College of Surgeons in Ireland; SIR PHILIP CRAMPTON, Bart.; J. W. CUSACK, V.P.R.C.S.; R. ADAMS, A.M., M.D.; and PROFESSOR HARRISON.

THE following cases having been placed in our hands by Sir Philip Crampton, Mr. Cusack, Mr. Adams, Dr. Robert Todd, of King's College, London, and Dr. Harrison, of the University of Dublin, we present them to our readers, together with such information, bearing upon the history of the cure of aneurism by compression in Ireland, as the literature of medical science affords, or as we have gleaned by conversing with those who are more familiar with the subject than ourselves, or who were eye-witnesses of those successful cases on which the present mode of treatment has been founded.

We have been induced to enter into the merits and details of this matter in the present form of an editorial article, at the suggestion of some friends who were anxious to have put forward in their true light, the just and honest claims of those who were entitled to merit for the introduction and practice of this most important improvement in surgical practice; and as far as in us lies we shall endeavour to set our readers and the professional public right with regard to a discussion still unconcluded in these kingdoms. This is a duty incumbent upon us as journalists; and not having been engaged in the treatment of any of these cases ourselves, we think we are, or at least we should be, the less likely to be swayed by influences or partialities that few among us are entirely free from. Moreover, we think that, as the entire merit of this invention is due to the surgeons of this city, it is from an Irish periodical that the true statement should come.

We do not propose to enter into the history of all the cases that have been treated, nor to entertain at any length

the question of the *modus operandi* of the cure. Mr. Storks, of London, when recording two successful cases of his own, in the *Lancet* of the 23rd of May last, published a table exhibiting (with the exception of Mr. O'Ferrall's)(*a*), all the cases which have lately appeared in the journals,—by whom the pressure was applied,—the seat of the disease,—the time occupied in the treatment,—the result, and other matters of minor detail: and Mr. Storks acknowledges, in conclusion, that "the profession is much indebted to the Dublin surgeons for the introduction of a practice which promises, in many instances, to supersede an operation which in the best of hands has proved too often fatal."

The first case which was treated successfully in this country, *of late years*, was that of Michael Duncan, who was cured of popliteal aneurism in the Richmond Hospital, by Dr. Hutton, between the 3rd of October and 27th of December, 1842; and this case, together with one by Mr. Cusack, and another by Dr. Bellingham, were related at the meeting of the Surgical Society on the 22nd April, 1843. The two former of these were published in the sixty-eighth Number of our former series (pp. 364–9), which was in circulation before the end of that month; and this was the *first* notice that appeared in print of these cases. Dr. Bellingham's was not reported till some days after. In describing his case, Dr. Hutton says: "The patient being reluctant to undergo the operation, I resolved to try compression of the femoral artery; and I entertained some hope of success from being informed by Mr. Adams that the late Mr. Todd had succeeded in a similar case, of which no account has been published."

Mr. M'Coy also acknowledged the priority of Mr. Todd, in a communication which he made to the Surgical Society, on the 8th of April, 1843, relative to a case treated many years ago by Mr. Duggan, to which we shall presently refer.

(*a*) Dublin Hospital Gazette, October 15, 1845.

Immediately following Dr. Hutton's communication in our Journal, is another to the same effect, by Mr. Cusack, of a man cured of a popliteal aneurism by the like means, in Steevens' Hospital, in January, 1843; in detailing which to the Surgical Society, Dr. Fleming stated that Mr. Cusack was induced to put this mode in practice from his remembrance of the favourable result of a case treated successfully by compression by the late Mr. Todd. In our next Number, that for June, 1843, we published the first essay upon this method of treatment, afforded us by Dr. Bellingham, to which paper we refer our readers for a very admirable *resumè* of the history of compression, and also notices of all the instruments then employed to effect that purpose. In this account, Dr. Bellingham says: Richerand in the second volume of the *Dictionnaire des Sciences Medicales*, "has related, perhaps, the earliest case of this kind: it was that of a grocer in Paris, the subject of popliteal aneurism, who, by preserving the recumbent posture for twelve months, restricting himself to a low diet, with a bleeding once a month, and at the same time compressing the artery in the thigh by means of an instrument, constructed on the same principle as a truss, was perfectly cured." About the year 1817, the Baron Dupuytren is said to have cured a case of popliteal aneurism by pressure; but Mr. Adams, who witnessed it, informs us that it did not turn out successfully. At page 463 of his essay, Dr. Bellingham also states: "The late Mr. Todd, some years ago, successfully applied compression by an instrument different from any of those alluded to, in one case of popliteal aneurism."

Our readers are, no doubt, well aware, that the idea of curing an aneurism by compressing the artery in which it occurs, between the heart and the sac, is neither an entirely novel procedure, nor confined to the practice of continental surgeons. Speaking of the dangers attending the Hunterian operation, Sir Philip Crampton in his truly practical essay upon aneurism, published in the Medico-Chirurgical Transactions, in 1816, says: "All practical surgeons will admit that

they look with anxiety for some means of averting dangers, the reality of which they have but too often had reason to lament. Accordingly we find Mr. Hunter himself, Sir Everard Home, Sir William Blizard, and several other distinguished surgeons, both in these countries and on the Continent, endeavouring by various contrivances to *compress* the artery *from without*, with a view of taking off the force of the circulation from the sac, *without inflicting any injury on the diseased vessel*. Their attempts, however, have not been attended with success, and the causes of failure are too well understood to render it necessary to insist upon them in this place." And that compression was tried, even in this city, so early as 1815, we learn from the following paragraph in the essay from which we have just quoted:—alluding to a patient of Mr. Dease's, labouring under popliteal aneurism, Sir Philip says, "A few days before Mr. Adrian had, by a contrivance similar to Sir W. Blizard's, endeavoured to *compress the artery from without;* but by no force that could be borne was he able to stop the pulsation at the ham,—the attempt was therefore abandoned. The operation was performed by Dr. Dease, at 12 o'clock, on Monday, the 27th February"(*a*).

What we are, however, anxious to establish is, that *the first successful case of popliteal aneurism treated by compression in these countries, was in the practice of the late Mr. Todd.*

At the meeting of the British Association held at Cork, in 1843, Professor Harrison recorded a case of popliteal aneurism cured by compression, to which, as there are some points of interest connected with it which have not been made public, we shall presently allude, but in which communication he distinctly stated his conviction of the then popular mode of treatment being but the revival of that proposed and successfully carried out by the late Mr. Todd.

At a discussion which took place at the Surgical Society

(*a*) Medico-Chirurgical Transactions, vol. vii., part 2, pp. 352 and 368; see also John Bell's Principles of Surgery, for an account of the various instruments then in use for arresting hæmorrhage, and compressing arteries.

in January last, on the subject of the cures effected by Messrs. Hutton, Cusack, and Bellingham, Mr. Adams, to whom much credit is due for his steady and determined advocacy of the claims of Mr. Todd, mentioned the case successfully treated by that gentleman, twenty years ago; and we had, in common with many others in this city, a traditional knowledge that the entire merit was due to that distinguished surgeon: and this opinion was confirmed by conversing on the subject with Sir Philip Crampton, Mr. Cusack, Mr. Adams, and others, who had personal recollections of the cases treated by Mr. Todd,—while, on the other hand, it has been asserted that the honour of first advocating "*the principle*" of the operation was due to Dr. Bellingham.

Under these circumstances, we communicated with Dr. Robert Todd, of London, on the subject, and have received from him the interesting document which will be found further on; but before inserting it, we would call the attention of our readers to the late Mr. Todd's Essay on Aneurism, published in the third volume of the Dublin Hospital Reports, in 1822. In the third case there related (page 121), he resolved to try the effect of pressure on a recent popliteal aneurism, in June, 1820. This case bears so forcibly on many of the points at present under discussion as to the treatment of aneurism by pressure, that we here transcribe a portion of it.

The patient, a man aged 30, was directed to remain in a horizontal posture, was put on low diet, and occasionally bled and purged. "The tumour was so much under the control of pressure on the inguinal portion of the artery," writes Mr. Todd, "that I was not altogether without hope that, *by diminishing the current of blood in the trunk of the artery, so as to favour the coagulation of the contents of the sac, a cure without operation might be effected;* at all events, it was obvious that by giving time to the collateral arteries to be dilated, the success of the operation would be rendered less uncertain.

"At first it occurred to me that the object I had in view

might be attained by the application of a tourniquet in the ordinary way to the upper part of the thigh; however, the pressure made by the circular strap of that instrument on the small vessels of the limb being an objection to its use, I constructed an apparatus resembling a common truss for femoral hernia, the spring of which was much stronger, and the pad longer, of a more oval form, and more firmly stuffed, than in the truss. The pad of this instrument was furnished with an inner plate of iron, which was connected with the outer iron plate by means of a hinge close to the junction of the outer plate with the spring, and a tourniquet screw passing through this plate had the effect, when turned, of making a greater or lesser degree of pressure with the pad, on the part to which it was applied.

"This instrument was put on like a common truss, the pad being placed in the line of the crural artery, immediately below Poupart's ligament, and it was effectually kept in its situation by a soft strap of chamois leather, which passed from the spring of the truss behind, on the inner side of the thigh, and buttoned in front on the outer plate of the pad. With this contrivance I possessed full power over the circulation in the femoral artery, at the same time that the collateral arteries suffered little or no compression. The principle of the instrument and the object for which it was employed were explained to and easily comprehended by the patient himself, so that he was enabled to regulate the degree of pressure according to his sensations. After a trial, however, of several weeks, he could not be persuaded that the plan adopted was productive of benefit. *During this period the tumour had obviously diminished, and its contents had acquired a firm consistence;* but the patient complained that the instrument gave him much pain, and that his health and spirits had suffered materially from confinement, rigid abstinence, &c. The operation was accordingly agreed to, and I performed it on the first of September, being two months after his admission into the Hospital."

From a careful examination of this case, we learn that Mr.

Todd was perfectly acquainted with the *principle* of the operation; and, in truth, although Mr. Todd was not himself aware of the fact, this case, we have every reason to believe, would have been, or even then was, a successful one, and would have perfectly recovered by means of the process then set up in the aneurism without the usual operation of tying the artery being resorted to; for we now know that the establishment of the collateral circulation, the diminution of the tumour, the lessening of the pulsation in it, and its acquiring a firm consistence, are proofs that the cure has been, to use a common expression, "set a going," and that nature will, under the most unfavourable circumstances, complete the cure, after the coagulum has taken place, though some pulsation may still exist in the tumour. This valuable fact was first made known to the profession by Professor Porter, in his article on aneurism in the last Number of this Journal; it has been lately proved in two or three instances; and the case afforded us by Mr. Cusack, to be detailed presently, is conclusive on the point.

The following case has been afforded us by Mr. Adams:

"James Scarlett, æt. 33, formerly a revenue tide-waiter, but then living on a pension, applied to Dr. Duggan, the revenue surgeon, in July, 1824, to be treated for a femoral aneurism of the left leg, situated just two inches below Poupart's ligament. Mr. Hayden and Mr. M'Coy, who were pupils of Dr. Duggan, and also myself, attended this man, and the following particulars of the early history of this case I now adduce, principally from my own note-book, and from information which Mr. Hayden and Mr. M'Coy have severally supplied. In my own case-book I find the following note: 'When James Scarlett first consulted the revenue surgeon, he was twenty-seven years of age, and an acting tide-waiter in the revenue. In the month of March, 1818, he had a popliteal aneurism, for which he never had medical advice, until one day, while he was wrestling with another revenue officer, he fell, and at that moment the popliteal aneurism became diffused.'

"Mortification of the foot set in, and Dr. Duggan, assisted by myself, Mr. Shekleton, Mr. Owen, Dr. Hayden, and Mr. M'Coy, performed amputation of the thigh four inches above the knee. In July 1824, that is, in six years after the amputation, an aneurismal tumour appeared in the femoral artery, about the size of a hen's egg, situated at the distance of two inches below Poupart's ligament, in the femoral artery of the stump.

"There could not be a much more unpromising patient than this: he had already shewn his predisposition to aneurism, and both before and since his limb had been amputated, had led a most intemperate and dissipated life. When the femoral aneurism appeared in the stump, I frequently examined the tumour, which was situated exactly two inches below Poupart's ligament; it had the usual signs of aneurism, and it is to be observed that it had a strong diastolic pulsation; it was gradually increasing when the treatment by compression was resorted to. This case seemed a peculiarly appropriate one for such treatment, and unsuited for any other; the dissipated habits of the man, and the situation of the aneurismal tumour, were circumstances which would have rendered any operation peculiarly hazardous. Dr. Duggan therefore gladly adopted the proposal of Mr. Todd, contained in the Dublin Hospital Reports, and determined to give a trial to the aneurismal truss, which, says Mr. M'Coy, 'I was directed by Dr. Duggan to apply to the femoral artery, above the aneurismal tumour. Mr. Todd had the kindness to lend his own apparatus, and I put it on.' Mr. M'Coy tightened the screw until all pulsation ceased. Next day, he adds, 'I found him easy, and there was no return of pulsation. The tumour in three weeks became solid, and diminished in size, and he was perfectly cured.'

"The man lived twenty years after the cure of the aneurism, and suffering much from the effects of the idle, dissipated mode of life he had adopted. During this period he lived occasionally with his brother, who resides near me, and I had frequent opportunities of seeing him; he complained occasionally of rheumatism in the right hip joint, as if it had suffered from

too much weight being thrown on it, in consequence of the left leg being amputated. In the year 1842 he was a patient of mine in the Richmond Hospital, under treatment for rheumatism. I then directed the attention of the class to his case, and related the remarkable facts which I have now detailed.

"Since he was discharged from the hospital, I seldom have seen him, but I learned from his brother, that he died on the 17th September, 1844. He also told me that his death was caused by his intemperate habits; and that, therefore, he never had medical advice for him. I had no opportunity of knowing his condition for the last year of his life, or of seeking or obtaining leave to make a *post mortem* examination, which I regret."

The instrument used by Mr. Todd is figured in the Dublin Hospital Reports (vol. ii. p. 123); but Mr. Cusack informs us that Mr. Todd, with whom he frequently conversed upon the subject, subsequently contrived another apparatus, consisting of a padded splint, into which the thigh fitted, and to which was attached a hoop, which passed over the limb, whilst to this latter was affixed a screw-stem, connected with a pad to press upon the vessel. With this instrument it has been reported that Mr. Todd completely cured a case of popliteal aneurism; but although the fact was testified to by Sir Philip Crampton, Mr. Cusack, Mr. Adams in particular, Dr. Robert Smith, and Dr. Williams, yet as the case had not been published, Mr. Todd's merits do not seem to us to have been fully admitted, although it is but just to say, that no one, in print at least, claimed to himself the honour of the discovery.

The following document is, however, conclusive: it was originally intended for publication in the Dublin Hospital Reports, of which the late Mr. Todd was an editor, along with Drs. Colles and Cheyne; but Mr. Todd's death very shortly after the case occurred, and before the appearance of the fourth volume of that work, caused the delay which has since taken place. It remained in the hands of the late Professor Colles till a few years ago, when it was returned to Dr. Robert Todd, to whom we are now indebted for it.

"Patrick Murtagh, aged 36, a strong athletic man, of rather intemperate habits, by occupation a labourer in a brewery, was admitted into the Richmond Surgical Hospital on the 5th of September, 1825, for an aneurism in the right ham. He does not attribute its formation to any particular cause; says he never received any hurt in the limb, but that he is exposed to much hardship and labour, and is constantly employed carrying barrels of beer up very steep steps.

"The aneurism is about the size of a turkey's egg; it lies across the popliteal artery, and extends laterally under the ham-string tendons, so that, by looking at the front of the thigh, it can be seen pulsating on either side. Its contents seem to be fluid, as, by making pressure on the sac, its size can be much diminished. The pulsation is easily commanded by pressure on the femoral artery below Poupart's ligament.

"He states, that about fourteen days previous to his admission he perceived a stiffness in the ham after walking a short distance into the country; on returning home he examined the part, and could perceive nothing but a little puffing in the skin; conceiving he had strained the joint, he paid no attention to it, and continued working as usual for some days, till the stiffness increased so much as to cause great inconvenience in moving the limb. At this time he perceived a small tumour in the ham, which, when pressed on, gave him pain, and throbbed violently. Still thinking it proceeded from a strain, he applied stupes and soap liniment; but perceiving its size increasing rapidly, he became uneasy, and consulted an apothecary, who immediately directed him to the hospital.

"On his admission he was ordered to keep his bed, and have a dose of the purging mixture of the hospital.

"Thursday, 8th. Complains of headach; tongue white; pulse, 100. V. S. ad ℥xii. Mist. purgans.

"17th. The tourniquet truss was applied at 12 o'clock, which perfectly commanded the pulsation of the tumour, but it returned in two hours after the application of the truss;

in the evening it was screwed tighter; pulsation ceased but for one hour.

"18th. The instrument not appearing to fit, was removed, and sent to be altered.

"21st. The instrument was again applied (it appeared to answer perfectly), and was kept on till 8 o'clock, P.M., when it was removed, as the man could no longer bear the pressure; the pulsation in the sac less violent.

"Thursday, 22nd. The instrument was applied at twelve o'clock, and continued till Saturday, 24th. The pulsation of the tumour has entirely ceased. Pressure was applied on the tumour by graduated compresses and a roller, wetted in a solution of muriate of ammonia.

"25th. The instrument was not applied yesterday (through mistake); however, there is no pulsation in the tumour. It was applied on the morning of the 25th, and remained on till Tuesday, 27th, when it was removed entirely.

"28th. No pulsation; tumour is diminishing."

This then was the second successful case during the lifetime of Mr. Todd. It was transcribed from the note-book of Dr. Connor, and is in the handwriting of Mr. Nunn, to whom we presented it, and who has furnished us with the following testimony:

"6, *Dawson-street, June 29th*, 1846.

"The report of the case of Patrick Murtagh, who was a patient in the Richmond Surgical Hospital, in the year 1825, under the care of the late Mr. Todd, is in my handwriting.

"I perfectly recollect this case, which occurred during the time I was an apprentice at the hospital; the cure was complete and permanent. I have latterly lost sight of this patient, but for some years I saw him frequently: the last time I saw him he was quite free from any trace of his former disease.

"R. L. NUNN."

And on the 1st of July, Dr. Connor of Battersea writes:

"I have a perfect recollection of the man, and of his calling at the Richmond Hospital three or four months after he had been discharged, and of his being exhibited to the class, and considered by all who saw him as being perfectly cured. No trace of the aneurism remained; but there was a small tumour in the ham unaffected by pulsation, and the pulsation in the tibial arteries was undiminished."

Professor Todd died in March, 1826, and so the matter rested, as far as any practical result was concerned, till *revived* by Mr. Hutton, in 1842. And here we feel it our duty to say, that but for this successful case of Mr. Hutton's, and those following immediately upon it, under the care of Messrs. Cusack, Bellingham, and Harrison, it is more than probable that the treatment of aneurism by compression would now be in the same state it was six years ago. Mr. Cusack informs us that shortly after the cure of Mr. Todd's case, he was lent the instrument employed, and tried it on a case in Steevens' Hospital, in the early part of 1826, but as the subject of it was very impatient and bore the pressure badly, he performed the usual operation, and the man recovered.

We now arrive at the year 1830, when Sir Philip Crampton again took up the matter, although in a somewhat different light; he has furnished us with the followingcommunication:

"*Merrion-square, July* 4, 1846.

"DEAR SIR,—Agreeably to your desire, I send you my notes (imperfect as they are) of a case of femoral aneurism, which was treated by *immediate* compression of the artery at the groin, in the Royal Military Infirmary, Phœnix-park.

"Corporal Coulson, aged thirty-six, was admitted into the Infirmary, in the autumn of 1830, with a large femoral aneurism, which occupied the upper third of the thigh; the greater part of the contents of the aneurismal sac were fluid; there was but little pain in the limb, but he complained of severe pain in the chest, shooting back to the shoulder-blade; on ex-

amination with the stethoscope, a very suspicious *bruit* was heard at the back of the thorax, rendering the existence of aneurism of the aorta but too probable.

"In such a case, ligature of the external iliac was not to be thought of, as the co-existence of thoracic with femoral aneurism too clearly proved a condition of the arterial system, the most unfavourable that could be imagined for the operation. I determined, therefore, to try if the coagulation of the blood in the aneurismal sac could be effected by compressing the femoral artery at the point where it passes over the pubis. The constant failure which had attended the attempts to compress the femoral artery above the aneurism, by means of tourniquets of various construction, even in the hands of the most eminent surgeons, was anything but encouraging; relying, however, on the experiments of Hunter and Freer(*a*), and those which I have detailed in the Medico-Chirurgical Transactions(*b*), which seem to establish that 'a very moderate degree of irritation applied to the external coat of an artery, aided by a sufficient degree of compression to bring its internal surfaces into contact, is sufficient to effect the obliteration of its canal,' I determined to try the effect of the *immediate* compression of the artery, by means of a compress, without the aid of a ligature. An apparatus was accordingly constructed, by means of which pressure, regulated by a screw, was brought to bear on the artery, which was previously laid bare to the extent of about half an inch(*c*).

"The operation was performed in the presence of Professor Colles, Mr. Cusack, and several other surgeons, civil and military. The immediate effect of the compression of the artery was to stop the pulsation in the aneurism and to diminish its

(*a*) Observations on Aneurisms, p. 14. (*b*) Med.-Chirurg. Trans. vol. xvi., p. 343.

(*c*) This apparatus, improved by Mr. Daly, was successfully applied in the first case of popliteal aneurism treated by Mr. Cusack in 1843; it is figured and described by Dr. Fleming, in the *Dublin Medical Press* of the 3rd of May, 1843.

bulk; pulsation, however, soon returned, but was easily commanded. The resident staff assistant-surgeon, aided by the hospital sergeants, took charge of the case, increasing the pressure on the artery when the pulsation in the aneurism returned, and relaxing it when the pain became intolerable. In this way the current of blood through the aneurismal sac was occasionally arrested completely, and at all times was materially obstructed. At the expiration of forty hours the pain from the pressure became so severe that it was thought advisable to remove the apparatus and to substitute a firm linen compress about two inches thick, which was secured by means of a tightly applied spica bandage; this degree of pressure was attended with no pain, but it did not completely suppress the pulsation. The bandage was tightened from time to time, and from day to day the pulsation became less distinct; and when I examined the man after an interval of three days, that is to say, six days after the operation had been performed, I found, to my great surprise and delight, that all pulsation in the sac had ceased, and that the aneurism had lost nearly one-half of its bulk. The bandage and compress were worn (as a measure of precaution) for a week longer, and were then removed altogether. Things went on in this satisfactory state, when, on the morning of the fifteenth or sixteenth day, the soldier who slept in the neighbouring bed was awoke by 'a loud gurgling noise' which proceeded from the man who had been operated on; he got up and raised him in the bed, which was deluged with blood, but he was quite dead,—the thoracic aneurism had burst into the trachea.

"On examining the parts concerned in the femoral aneurism, it was found that the artery was pervious as far as the sac, which was filled with a soft coagulum of an intensely dark colour generally, but of a bright arterial colour towards the centre, and here the coagulum seemed to be of very recent formation; a portion of it about half an inch in length passed into the lower or distal part of the artery.

"The remarkable success which of late has attended the treatment of popliteal aneurism by the '*mediate compression*' of the femoral artery above the sac, entitles this operation to be considered as a means of cure, which, if not universally, is at least generally applicable to such cases. There are cases, however, of external aneurism,—the axillary and carotid, for example,—in which this mode of treatment cannot be employed, for it is well-known that a degree of mediate compression, which would be sufficient to arrest the current of blood through the subclavian artery, could not be endured for ten minutes, and the same is true of the common carotid. I am by no means so certain, however, that *immediate* compression, if applied to the subclavian artery at the point where it passes over the first rib, and effected in the manner described in the following case, might not be employed with success.

"A dragoon, about 35 years of age, and apparently of a good constitution, suffered from popliteal aneurism of six months' standing; he was received into the Royal Military Infirmary in the summer of 1830, and, after the usual course of preparation, the artery was tied with a single silk ligature at the usual place, in the presence of Mr. Cusack, Professor Porter, and several other surgeons. Several cases of secondary hæmorrhage after operations for aneurism having occurred in the course of the year, in consequence of the giving way of the artery at the place of the ligature(*a*), I determined to try how far such an occurrence might be prevented by drawing the noose of the ligature no tighter than was necessary to arrest the current of the blood without dividing the inner and middle coats of the artery; the ligature was accordingly closed slowly, while one of the assistants placed his hand on the aneurism. The moment he announced that "the pulsation had ceased," the noose was secured by a second knot. The man expressed no pain during the slow closure of the ligature. About an

(*a*) See Guattani de Wocamaslaus on Aneurismal Surgery, Med-Chirurg. Trans. vol. vi. p. 350.

hour after the operation, an obscure pulsation could be detected in the aneurism: it was attended with this remarkable circumstance, that when the horizontal posture was observed the pulsation ceased; but when the body was made to form a right angle with the lower limbs it immediately returned, a circumstance easily accounted for by the different degrees of tension to which the artery was subjected, in the different angles formed by the pelvis on the thighs, in the recumbent and sitting postures respectively. Obscure pulsation continued to be felt in the aneurism for ten days; after the expiration of this time it ceased altogether. On the sixteenth day the ligature, which lung loosely from the wound, was removed, and within an hour afterwards there was a smart arterial hæmorrhage from the hole which had been occupied by the ligature. On arriving at the hospital, I found that the resident surgeon had stopt the hæmorrhage, by pressing his finger on the bleeding orifice. I immediately formed a rolester, consisting of the hospital sergeant and six men, selected by him from the patients in the ward; they were instructed as to the manner which the compression was to be applied; and the resident surgeon undertook, at each relief of the guard, to press the femoral artery against the pubis, until the compression at the wound had been perfectly adjusted; an efficient pressure was, by this means, maintained for upwards of forty hours. It was then gradually withdrawn. The bleeding never returned, and the man returned to his duty in a month.

"I cannot conclude this very hasty and imperfect notice, without expressing my strong conviction that manual pressure may, under due regulation, be advantageously substituted in many cases, not only of wounded artery, but of aneurism, for the ligature or for the best constructed instruments for effecting mediate compression.

"I remain, dear Sir,

"Your's faithfully,

"PHILIP CRAMPTON."

Here we beg leave to remark that the practice of tying arteries for secondary hæmorrhage has been for many years on the wane in this city. While resident in Steevens' Hospital we happened to be standing in the ward on three different occasions when the brachial artery sprung, after an operation, at the bend of the elbow. The practice taught in the hospital was immediately had recourse to: the dressings were removed from the part, and pressure made with the finger directly on the bleeding vessel; a corps of attendants was then organized, and immediate compression upon the artery kept up by the finger, with the intervention of a small piece of prepared sponge, for the next twenty-four or thirty-six hours, and with complete success. Two of these cases were under the care of Mr. Cusack, and one under the late Professor Colles. Many other similar instances will be remembered by the former students of Steevens' Hospital.

The instruments used by Messrs. Todd, Crampton, Hutton, Cusack, and Bellingham, are now pretty well known to the profession, and it is not the object of this paper to describe them, or the many other ingenious contrivances and improvements by various members of the Profession, Mr. L'Estrange in particular, as well as those adapted by the instrument-makers, Mr. Read and Mr. Milliken. All these, however, were more or less defective, *inasmuch as they applied the pressure on but one point;* and few persons will be found who have patience and fortitude enough to bear it in this way for a sufficient length of time to cause such a diminution in the calibre of the vessel as will permit of the formation of a clot in the aneurismal sac. This difficulty was, however, obviated by a patient treated by Professor Harrison, who contrived for himself an apparatus, by which the pressure could be *applied on several points in the course of the artery*, and so relieve the distress and pain (which is, in many instances, scarcely supportable), by altering the pressure from one point to another in succession, during the process of cure. Professor Harrison gave a history of this case at

the meeting of the British Association, held at Cork, in August 1843: some brief notices of which appeared in the local newspapers, and in the Athenæum, at the time; but as the case has never yet been properly recorded, and as there are some points in its history of great practical importance, we here insert an abridgment of it, from the manuscript kindly afforded us by Professor Harrison.

Robert Hoey, aged twenty-nine, a carpenter, of great intelligence, and of temperate and regular habits, was admitted into Jervis-street Hospital, with popliteal aneurism of about a month's standing, on the 9th of May, 1843. It being deemed a proper case in which to try pressure, the usual instrument then in use, consisting of a padded splint, with a circular hoop, holding the stem of a pad which compressed the vessel where it passed over the ramus of the pubis, was applied. The pain experienced from this, when tightened so as to stop the pulsation, was so great, that he was unable to bear it for more than an hour at a time. Several ineffectual attempts were made to keep up the pressure by means of this apparatus, but it never could be endured for more than the period just specified, when it was loosened on account of the pain, and after a few minutes re-applied.

On the 12th, it is reported that the tumour was somewhat harder and smaller than on admission, but no sensible effect had been produced on the pulsation. After this he took small doses of the tincture of digitalis morning and evening, and was kept on very low regimen.

On the 13th some œdema was visible on the front of the leg; the pressure continued as usual at intervals; he complained greatly, not only of the pressure of the pad upon the artery, but of the inconvenience of the posterior splint. Matters went on in this way till the 18th, when, a slight abrasion being perceived on the point of pressure in the groin, the instrument was removed, and applied about four inches below the pubis.

During the next four days he complained greatly of loss of rest, which even an opiate failed to procure.

On the 22nd a swelling presented itself on the outside of the knee, about the size of a nutmeg, painful to the touch, and evidently communicating with the aneurismal sac.

At this period the sudden increase of the tumour, the great loss of rest, the inability of bearing the pressure, the irritability, and the evident sinking of the patient's health, was such as induced Dr. Harrison, in consultation with the other surgeons of the hospital, to determine on the performance of the usual operation. The next day, however, the patient was better in every respect, and for the time it was abandoned.

On the 23rd the instrument was removed to its original position, but little progress was made in arresting the pulsation or diminishing the tumour; the pain was complained of as intolerable; he was unable to bear the instrument pressed home for more than one hour at a time; and was exceedingly restless, irritable, and feverish. The instrument was completely removed on the 27th, and that of Mr. L'Estrange applied on the 29th; and thus the treatment was continued during the entire month of June. Several instruments were tried, but none of them could be borne for a sufficient length of time to make any material or permanent change in the aneurism. On the 4th of July the patient was obliged to leave the hospital, owing to the death of a relative, but was allowed to take the instrument with him, with the intent and mode of application of which he was perfectly familiar.

On his return home, having reflected upon the cause of failure, which he naturally attributed to his having being unable to bear the pressure on the artery at the pubis, he invented, and immediately applied, a very simple instrument, on the principle of the carpenter's clamp, consisting of a small, well-padded iron splint, four inches by three, connected with a steel bow, in the front of which worked a screw, furnished with

a pad, with which he could compress the artery in any part of its course on the anterior or inner part of the thigh. He at once applied two of these, the upper compressing the vessel about three inches below Poupart's ligament, the lower about the middle of the thigh, but each of them capable of being shifted occasionally, as the point of pressure became tender. With these he completely commanded the circulation for upwards of twenty-four hours. As soon as the upper caused much pain, after an hour or so, he tightened the lower one, and relaxed that above, and so alternated from one to another, always making sure that the circulation was fully commanded, by one instrument being screwed down, before he loosened the other. He had thus the satisfaction of completely effecting his own cure; but, fearful of any return, he wore the clamps even outside his trousers for a considerable time afterwards.

We examined this man on the 1st of last month, along with Sir Philip Crampton, and we can state that the cure remains most perfect; there is still some fulness in the ham, but he follows his occupation, and walks about as well as ever, and does not complain of any sensation in that limb more than in the other. Although this man owes much to Professor Harrison, who commenced his treatment and cure, he certainly achieved for himself, personally, a great good, and for science a very valuable improvement. The weight used by Dr. Bellingham is somewhat to the same effect, and appears to us a very meritorious invention, though not equally effective with the clamp.

The following case has been placed in our hands by Mr. Cusack, who treated it a few months ago in Steevens' Hospital. The reports from which we extract have been drawn up by Dr. Molloy himself, and by Mr. Harris, who had charge of the case while in the hospital:—

W. H. Molloy, M.D., aged thirty-three, a practitioner in the county of Donegal, of strong, athletic make, sallow complexion, dark hair and eyes, energetic in character, but impatient of pain. Has been accustomed to take a great deal of horse

exercise in the performance of his duties, in an extensive district; has enjoyed good health, with the exception of periodic attacks of rheumatism, several of which terminated in effusion into one or both knee joints. On more than one occasion a tumour, the size of an egg, was perceived in each popliteal space after a rheumatic attack: it was elastic, free from pulsation, and always disappeared as the rheumatic effusion went off(*a*.)

On the 9th of February, 1846, he was seized with pain in the right knee, which he supposed to be the forerunner of one of his usual rheumatic attacks; but it was accompanied with coldness of the limb, and numbness about the great toe. On the 10th all these symptoms were increased; the superficial veins had also become greatly distended, and the foot had assumed a livid colour. 11th, a tumour the size of a small orange, soft, compressible, circumscribed, and pulsating synchronously with the heart, was discovered in the right popliteal space; its pulsation could be arrested by pressure on the femoral artery in the groin. The true nature of the case was then manifest; and on the 27th of the month, Dr. Molloy placed himself under the care of Mr. Cusack, who had him provided with an apartment in Steevens' Hospital, in order that he might enjoy the advantages of the continued watching and attention so necessary in the subsequent treatment of any operation, and which can only be derived from the medical staff of a large hospital. It was deemed advisable to treat this case by pressure on the femoral artery, previous to the application of which, complete rest was enjoined, and he was put upon the use of tincture of digitalis and laurel water.

The hospital report of this date, after describing the tumour, states that when the limb was extended the size of the

(*a*) Mr. Adams has suggested to us that these popliteal swellings arose from the effusion in the joints spreading into sacs of the synovial membrane which protrude into that region, and have been occasionally mistaken for aneurism. See Mr. Adams's article on the Abnormal Condition of the Knee Joints in the Cyclopædia of Anatomy and Physiology.

tumour greatly increased, but that on flexion it became much smaller, and that the pulsation in the tumour was strong, but devoid of *fremitus* and unaccompanied by a *bruit*. There was no appreciable difference in the temperature of the limbs, nor any œdema present, and the pulsation in both tibial arteries was quite perceptible. The flexion power of the limb was so much impaired that he could with great difficulty ascend the stairs. The heart's impulse and sounds were normal.

On the second of March pressure with the clamp invented by Hoey, Dr. Harrison's patient, was first applied upon the femoral artery, at the junction of the upper and middle third of the thigh, so as to diminish without entirely impeding the current of blood through the artery, or causing the pulsation in the tumour to cease completely. He was not able to endure even this comparatively moderate pressure for more than ten minutes at a time on any one point of the course of the artery. Other instruments were tried next day but with the like effect. He suffered much, especially during the night from continual starting of the limb. On the 7th it is reported that he has borne the pressure very badly; the foot and leg have become œdematous, lessened in temperature, and painful. Pressure on the artery where it enters the Hunterian canal produces great pain and numbness down the limb, and can only be borne for a very short time. A comparatively slight amount of pressure applied upon the artery where it passes over the ramus of the pubis, completely controls the pulsation of the tumour, but owing to the presence of some enlarged glands in the groin, it cannot be long maintained. The startings in the limb continue; no material alteration in the tumour. On the 9th a circular instrument, consisting of a posterior pad, attached to a hoop, which went round the limb, on the front of which a sliding screw-pad was attached(*a*), was

(*a*) This instrument has been since very much improved by Mr. Read of Parliament-street, who made the screw stem to work through a ball and socket joint, by which means the pad is more accurately adjusted and kept more steadily in its place. He has also constructed a very ingenious compressing apparatus, which fits round the

applied, and this he bore for upwards of an hour with much greater ease than the former one, but at the end of that time it was obliged to be taken off in consequence of its producing both congestion and œdema. Late in the evening of that day it was re-applied and kept on for more than four hours; with this instrument he was able to turn on his side, which he was not capable of doing before, and he slept with more comfort than he had done since the commencement of his treatment.

On the 13th, the instrument was pressed down so as to stop all pulsation in the tumour, but this produced so much pain that it could only be borne for about twenty-five minutes at a time in any one position.

15th. There has not been much alteration in the tumour since last report, except a slight diminution in size, and a thickening of its walls. He still complains of the numbness round the knee: the œdema of the foot and leg have increased, and he now experiences a sensation of oppression in the region of the heart; he sleeps, and bears the instrument, however, much better than before. The artificial heat has been kept to the limb; and the tincture of digitalis continued.

22nd. He has become more reconciled to the instrument, and can now bear the pressure, especially below Poupart's ligament, for a considerable time. The tumour is in much the same state. Ice to be applied to it. 25th. The tumour has lessened in size, and become somewhat harder; two small vessels running parallel to each other can be detected pulsating on its surface. On this circumstance, writes Dr. Molloy, in his report, "I am inclined to think that the pulsation of these vessels might be mistaken for that in the tumour, which was perceptible after the screw had been pressed home, and the pulsation in the main artery had been arrested."

27th. Tumour and all the other symptoms as before, but on the removal of the instrument the pulsation returns.

pelvis, and has attached to it a moveable bow, furnished with a screw pad for applying the pressure on the groin, and capable of being adjusted to either side.

30th. The tumour has become smaller and harder than when its size was last noted, but its pulsation is still quite evident. The muscles of the thigh have become greatly reduced in size, and the slightest motion now displaces the pads. In order to examine the tumour, it is necessary to bury the fingers deep into the popliteal space. Since the last report the œdema has disappeared, and the starting has lessened. His general health is not so good as on admission, and he has, therefore, been allowed a more liberal diet, but the use of the digitalis has been continued. It was now determined to keep up uninterrupted pressure for another week, and after that, to relinquish it, even if the pulsation in the tumour had not completely subsided; moderate pressure was also applied directly over the tumour.

April 5th. Pressure has been kept up steadily, with a variety of instruments, since last report; but, except for a short time, they have not been pressed sufficiently tight completely to arrest pulsation in the tumour. The loss of rest is still greatly complained of; appetite very bad. 8th. Pressure almost insupportable; strength diminishing.

14th. Pressure discontinued altogether; a compress of sponge applied to the tumour, and retained in position by means of a bandage applied moderately tight over the entire limb. Allowed to sit up. 16th. It is found that the tumour has suffered a marked reduction in size during the past week, and has also become more solid; the pulsation, however, can still be detected in it. 24th. Left the hospital for Kingstown, where he remained to recruit his general health for the next fortnight, the tumour still continuing small and hard, but pulsating.

"On May the 12th," writes Dr. Molloy, "I left Kingstown for the country, where I commenced walking about as usual, although lame, and my knee stiff and painful, up to the 22nd, when I ventured on horseback to pay a professional visit. During my ride it was with difficulty I maintained my seat, as the animal I rode was remarkably spirited. On making a sudden exertion, the knee, and particularly the

tumour, immediately became very painful, and the latter felt as if it had been stretched or torn. On my return home I removed the roller and compress, and found the tumour very tender to the touch, and increased in size, and I experienced a sharp lancinating pain shooting upwards in the course of the artery. At eleven o'clock that night the pain had become so great that I was obliged to take a full opiate, which procured me immediate rest. On awakening at five o'clock the next morning, I found the leg flexed on the thigh; the leg and foot cold, but the knee hot, and the collateral circulation fast establishing itself round the joint; the tumour hard and painful, *but perfectly free from all pulsation*. I remained perfectly quiet for three weeks, when the limb, which had been greatly wasted, and remained cold up to this point, began to increase in size and temperature. I am now, June the 27th, able to walk slowly for a mile or two without inconvenience, but when the pace is quickened, there is still pain of the leg and ankle, and stiffness of the knee. The tumour is much smaller, and can barely be felt deep in the popliteal space; there is no pulsation evident in either of the tibial arteries; motion of the limb much freer; temperature of the foot gradually increasing; general health very good. The greatest inconvenience which I experience is a disagreeable numbness along the inner side of the knee, leg, and foot, probably caused by some injury which the saphena nerve incurred during the process of applying the pressure."

Mr. Todd, in his essay in the Hospital Reports, has recorded a second case of popliteal aneurism, treated in 1820, in which he also applied pressure, together with depletion, even to a much greater extent; but he says the man "became impatient, and was unwilling to submit to a continuance of that rigid discipline which it had been thought expedient to adopt," so the artery was tied forty-five days after his admission into the Hospital(*a*).

(*a*) The Dublin Hospital Reports, vol. iii., p. 133.

In conclusion, we beg to present our readers with a tabulated arrangement of all the cases of femoral and popliteal aneurisms which have been treated by pressure on the femoral artery in Great Britain and Ireland.

No.	Date.	Surgeon.	Locality.	Description of Aneurism.	Age of Patient.	Result.
1	1820	Mr. Todd,	Dublin,	Popliteal,	30	Fem. art. tied.
2	,,	,,	,,	,,	27	,,
3	1825	,,	,,	,,	36	Cured.
4	1824	Mr. Duggan,	,,	Femoral,	33	,,
5	1826	Mr. Cusack,	,,	Popliteal,	—	Fem. art. tied.
6	1843	,,	,,	,,	55	Cured.
7	1844	,,	,,	,,	26	,,
8	1846	,,	,,	,,	33	,,
9	1830	Sir P. Crampton,	,,	Femoral,	36	,,
10	1842	Mr. Hutton,	,,	Popliteal,	30	,,
11	1843	Dr. Bellingham,	,,	,,	32	,,
12	1844	,,	,,	Femoral,	35	,,
13	1846	,,	,,	Popliteal,	40	Doubtful.
14	1843	Mr. Liston,	London,	Femoral,	30	Cured.
15	1844	,,	,,	,,	53	,,
16	1843	Dr. Harrison,	Dublin,	Popliteal,	29	,,
17	1844	Mr. Kirby,	,,	,,	28	,,
18	,,	Mr. Allen,	Haslar Hospl.	,,	32	,,
19	,,	Mr. Greatrex,	London,	,,	27	,,
20	,,	Mr. Porter,	Dublin,	,,	29	,,
21	1845	,,	,,	,,	—	,,
22	1844	Mr. Jolley,	Torbay,	,,	28	,,
23	1843	Mr. Harrison,	Bristol,	,,	42	Fem. art. tied.
24	1845	Mr. Dartnell,	Chatham,	,,	38	Cured.
25	1846	Mr. Mackern,	Litherland,	Femoral,	30	,,
26	1845	Mr. Storks,	London,	Popliteal,	32	,,
27	1846	,,	,,	,,	24	,,
28	1845	Mr. O'Farrell,	Dublin,	,,	32	,,
29	1846	,,	,,	,,	37	,,

From this table it would appear, that twenty-nine cases of aneurism—six femoral, and twenty-three popliteal—have been treated by pressure upon the artery leading to the sac; of which number, nineteen occurred in Dublin; and that in four, the femoral artery was tied, chiefly from want of confidence in pressure, on the part of either surgeon or patient, and that in twenty-five instances this mode of treatment was successful. Mr. Todd's three cases, Sir Philip Crampton's case, Mr. Duggan's case, Mr. Cusack's case in 1826, and also that of Dr. Molloy, and Mr. O'Ferrall's two cases, have not been before introduced into any of the notices or tables of this operation which have

appeared in the periodicals. Dr. Bellingham's first two cases occurred in the same individual; his third I have, with his own permission, marked doubtful, because the patient died of erysipelas during the process of cure,—the subject of it was originally under the care of Mr Cusack. Mr. O'Ferrall's cases will appear at length in our November number.

Sir P. Crampton's second case has not been classed in the foregoing table, inasmuch as it was one of accidental hæmorrhage in which the pressure was resorted to from unavoidable necessity, and not originally employed as a means of cure; and Mr. Adrian's case, mentioned in the Medico-Chirurgical Transactions, has not been sufficiently detailed, to entitle its being placed in the foregoing category. The subject of Mr. Cusack's third case died suddenly of disease of the heart before he left the hospital—this, however, in no wise militates against the applicability of the treatment, even in that individual case. The man died *cured* of his aneurism, and the subsequent examination of the parts concerned in that disease was of vast importance in the explanation of the mode of cure. The propriety of applying pressure in this case has been questioned, and, we think, most unjustly. Had the usual operation of tying the artery been resorted to—an operation periling life—in such a case we do think the surgeon would be reprehensible. But it is well known that many persons with diseased hearts and diseased arterial systems, will live for years after the supervention of such; and are these persons to be allowed to die of the bursting of an external aneurism, when a perfectly bloodless procedure (for it is not an operation), and one, as far as we yet know, unaccompanied with any risk; together with rest; the use of the tincture of digitalis; a low regimen; and the preservation of the horizontal position for a fortnight or three weeks, may prolong their lives for years?

In ten instances, local pressure on the aneurismal tumour by means of pads and bandages was used in addition to the pressure by the instrument. We have omitted the column for the

"time occupied in the treatment before *bruit* and pulsation had ceased," inserted in Mr. Storks' table, because no fair standard can be at present established, nor any practical deduction drawn from it. The time has varied from ninety-one days to five; but an examination of the published cases, and even of some of those detailed in this paper, will shew how irregularly the pressure was applied; and it is quite apparent that its removal at *a particular time*, even for a few minutes, and allowing the flow of blood through the sac again to take place, will undo all that had been before affected. It is, moreover, very possible that in many instances the pressure has been continued far longer than was necessary. Should we not first apply a very moderate degree of pressure, so as to accustom the patient to bear it with comfort, and then gradually increase it to a particular point, when it is possible that the artery may have become accustomed to it, and the collateral circulation become increased; then put it down firmly for a few hours, and the cure may be so far accomplished that further pressure may be unnecessary? We would suggest to those engaged in the treatment of aneurisms by compression, or in the manufacture of instruments to effect that purpose, that an apparatus made sufficiently light and small, so as not to prevent the patient turning in bed, and provided with a number of pads (three at the least), adapted along the course of the artery, so that several points of pressure could be made in succession, would be a great desideratum.

Although we are but in the infancy of this very great improvement, yet from the foregoing observations, as well as what has been already published by others on the subject, the following conclusions may, we think, be drawn:

I. That numerous attempts have been made, during the present century, to cure external aneurisms, popliteal in particular, by means of pressure upon the artery between the sac, and the centre of the circulation; and that various instruments have been contrived to effect this purpose.

II. That by such means, it is more than probable that occasional cures were made.

III. That popliteal aneurism seems the most favorable for the application of pressure.

IV. That to Mr. Todd is due the merit of having first fairly tried, and successfully applied the pressure treatment of popliteal aneurism in these kingdoms.

V. That no permanent position was established for the treatment of aneurism by compression, until the cases treated by Mr. Hutton, Mr. Cusack, and Dr. Bellingham, were brought before the profession at the Surgical Society of Ireland, in 1843.

VI. That up to this period the instruments made to effect the compression were defective, inasmuch as they applied the pressure on but one point.

VII. That the improvement introduced by Dr. Harrison's patient, Hoey, of applying a number of clamps along the course of the artery, has done much to remedy this defect, and has afforded surgeons a very valuable hint on the subject.

VIII. That from the history of cases recorded by Professor Porter and Mr. Cusack, it would appear that it is not necessary, completely, to arrest the pulsation in the tumour, by pressure on the artery, in order to produce a cure.

IX. That this cure is effected by means of a coagulum formed in the sac, either by lessening the current of blood flowing through the artery, or by some peculiar power of coagulation imparted to the blood, aided by the contraction of the sac.

X. That in order to effect this coagulation, Galvanism has been employed, and appears to hold out hopes of success.

XI. That from dissections we learn, that it is not necessary to obliterate the artery between the point of pressure and the sac, in order to produce this coagulum, and effect a cure.

XII. That pressure has been tried, and produced coagulation, even when applied to the distal side of the sac.

NEW IMPROVED TRUSS

FOR INGUINAL AND FEMORAL HERNIA.

The statistics of hernia, however differently calculated by medical authors, exhibit a frequency of this troublesome and dangerous infirmity that few are aware of. Mr. Teale, of Leeds, in his recent admirable "Treatise on Abdominal Hernia," says, "the relative frequency of hernia in the human race, or in the population of particular countries, has been very variously estimated. By Arnaud it has been calculated that one-eighth of mankind are the subjects of it." (*a*)

The disease does not appear to occur so frequently amongst the Asiatics generally as might be inferred from the relaxing nature of their climate; but in America, more particularly amongst the inhabitants of the United States, and the British Provinces, it is extremely prevalent; and in the South of Europe, and the adjoining shores of Africa, it is more common than in England. In Malta, especially, it is said few persons escape it; and in Egypt herniæ are extremely common, and often of unwieldy bulk. (*b*) This is also the case amongst the black population of the West India Islands.

In Switzerland, too, the disease is one of very common occurrence; (*c*) and in France M. Malgaigne estimates that there is one hernial subject in $21\frac{1}{2}$ of the entire male population. Mr. Turnbull, Surgeon of the London Truss Society, says that, after most diligent and general enquiry throughout the kingdom, he is induced to estimate the hernial subjects, of all ages, and both sexes, in England, as one to fifteen. (*d*)

(a) p. 31.
(b) Cooper on Hernia, Part I., p. 12.
(c) Lawrence on Ruptures, p. 42.
(d) Teale on Hernia, p. 32.

Another recent writer on this subject (*a*) states, "it has been said every third man among us is ruptured; and this, I believe, is not above the average if applied to a particular class—the agricultural labourers."

In the British Army, the soldiers of the Cavalry and Artillery are usually invalided as soon as they are found to be affected with hernia; but the soldiers of the Line, if ruptured, are not considered to be incapacitated for the service unless the hernia be of large size or difficult of support. In this arm of the service the number of hernial subjects is very considerable, and, as I shall endeavour to shew hereafter, much more so than is generally supposed.

When we consider then, the extraordinary liability of the human race, especially throughout civilized Europe and Northern America, to become affected with this malady, the amount of misery it entails, and the danger occasioned by it to human life, it cannot be matter of surprise that many surgical operations should have been proposed, and numerous mechanical contrivances, from time to time, invented, for its permanent or palliative cure.

With regard to the surgical operations proposed for the radical cure of reducible hernia, many have been attended with fatal results, and the great majority have utterly failed. They have mostly had for their object the destruction or closure of the hernial sac, and some have succeeded in this object; "but it is necessary," adds Mr. Teale, "to repeat that the obliteration of the sac affords but a feeble barrier to a fresh hernial descent, and only a very slight advance is thereby made towards a radical cure of the disease." (*b*)

With regard to mechanical contrivances no efficient substitute has yet been found for the elastic or spring truss.

Sir A. Cooper, in his great work on Hernia, says, "the only instrument that can safely be relied on for the support of a hernia, is a truss of steel; all other

(a) Spong, Lancet, Vol. VI., p. 143. (b) p. 80.

bandages affording only a false security more dangerous even than the total omission of this kind of support." (*a*) Scarpa, writing on the same subject, says, "of all the benefits that modern surgery has conferred upon the human race, that of the invention and perfection of the truss is one of the most conspicuous." (*b*) And Mr. Lawrence, in his excellent "Treatise on Ruptures," adds, "considering the great number of ruptured persons, together with the essential relief which they derive from these bandages, we shall not fail to regard them as the most useful production of modern surgery." (*c*)

When the paramount importance of the hernial truss is thus advocated by the highest authorities in our profession, and its vast utility felt and acknowledged by so large a mass of the civilized population of the world, little excuse, I hope, need be offered for presenting to the public a new modification of this instrument. The hernial truss is still far from being a perfect instrument, and I believe it to be quite impossible to construct one that will answer in every case of inguinal hernia. Each improvement, however, on the original may be considered as a step gained; and although I make no pretence whatever to claim for mine any originality except as a combination, my object will be fully attained if it be found upon trial to possess any advantage over those commonly used; and especially if it be found useful to the soldier, with a view to whose benefit it was originally constructed. But before proceeding to the description, I shall take leave to premise a few very cursory remarks upon inguinal hernia, and chiefly as regards this disease in the soldier.

A recent writer before referred to, asserts that "hernia is never suddenly produced—in fact that it is a direct physical impossibility, and that the period of time required to produce that stage of the lesion when it is called a bubonocele occupies months and sometimes years, * * * that it steals on by slow

(a) p. 14. (b) p. 100.
(c) p. 91.

and insidious steps, * * * and that the whole process of hernial formation is one of degrees." (*a*)

However correct this assertion, so different from commonly received opinion, may be, certain, I think, it is, that the sudden production of an inguinal hernia from any violent exertion of the voluntary muscles, a jump, a fall, or other accidental cause, is an occurrence that very rarely happens, the hernial apertures and parts around being previously in a perfectly sound and healthy state, while inguinal hernia, in its incipient stage, is a complaint that very frequently exists without any knowledge whatever of the individual affected. A person, therefore, in this state, as Mr. Spong very justly remarks, may well suppose that he becomes ruptured for the first time when, in lifting a heavy weight, or from some accidental cause, the small portion of bowel previously protruded only into the inguinal canal, suddenly bursts through the external ring, and shews itself in an unmistakeable tumour in the groin, or in the scrotum, while in reality he was, to all intents and purposes, "ruptured months or perhaps years before."

The position I have held, for the last five years, at Chatham, where the whole of the invalid soldiers of the British army (with the exception of those serving in Ireland) are assembled annually, has afforded me very ample opportunities of observing hernial complaints, and practically studying the application and fitting of trusses upon ruptured soldiers and others; and having in my frequent inspection of invalids, detected very many cases of incipient hernia, which had escaped the knowledge or observation not only of the regimental Medical Officer, but of the affected individuals themselves, I am fully confirmed in the opinion expressed by the last named writer, that inguinal hernia is seldom, if ever, suddenly produced, but is a

(a) Spong. Lancet, Vol, VI., p. 142.
For a perusal of the Author's views on this interesting subject, I beg to refer to the article in question, which will be found under the head of "Contributions to Practical Surgery."

disease of slow and insidious formation. I have been induced to offer the foregoing remarks on the frequency, and unsuspected existence, of early hernia, with the hope of attracting the attention of regimental surgeons in the examinations of their men, to a stage of the disease that is in general as curable, if looked to in time, as it is full of danger if neglected.

It is not an unusual thing, however, (as the gentleman last quoted remarks) when a patient does complain of a feeling of weakness and relaxation of the hernial region on either side, with the appearance or sensation perhaps of a slight protrusion on coughing, for the surgeon to say—"You are not ruptured yet, and probably never may, and I see no necessity for your wearing a truss at present." But it is precisely at this time that a truss is of the greatest value; for if a well-fitting one, with a light spring, be now applied and steadily worn, not only is the patient with certainty secured from the greater evil—the full developed rupture—but is, with almost equal certainty, permanently and radically cured.

As regards the soldier, were this point more carefully attended to, many valuable men might be retained in the service, who must otherwise be discharged as ineffective from rupture.

It is acknowledged, then, by the highest medical authorities, that the only security for a ruptured person is the wearing of a truss of elastic steel; the object of which should be the application of a "constant pressure on the part where the hernia opens into the abdomen, to shut the mouth of the sac, and thus oppose an effective resistance to the protrusion of its contents."(*a*)

"Wearing an elastic truss," says Lawrence, "not only keeps the viscera within the abdominal cavity, and thereby protects the ruptured person from all the dangers to which the existence of his complaint would otherwise expose him; but if continued for a sufficient length of time, even affords a prospect of a radical cure. The constant pressure of the pad keeps the neck of

(a) Cooper on Hernia, p. 14.

the sac empty, and thus favours the commencement and progress of those natural processes which, after the replacement of the viscera, tend to prevent a recurrence of the complaint; viz. spontaneous reduction, or gradual contraction of the hernial sac, with obliteration of its neck or body, and agglutination of its sides." (a)

Several modifications and improvements have, especially of late years, been made in the original spring truss. Without, however, alluding to any of these instruments, all of which have their several merits, I shall proceed to a description of the one which it is the object of this paper to offer to the notice of the public.

The spring, which (though strong from being manufactured of wrought iron) is light, and elastic, is of the semicircular kind, the fulcrum being placed behind near the top of the sacrum, and the resistance in front. It has a graduated downward curve at its anterior extremity, which brings the pressure of the rupture pad directly upon the upper hernial opening and the inguinal canal. The spring has a casing of padded leather, continuous with which is a strap of the same materials, which, passing round the opposite hip, and buttoning to the pad in front, is intended to steady the fulcrum, and keep the instrument in its place.

The anterior or rupture pad is formed (like Dr. Chase's American truss) of hard wood, polished and of a rounded oval, and somewhat conical shape.

The back pad is flat, formed of strong leather, padded on the inner face, and furnished with two bridles on the outer one for connection with the spring. This pad rests in the hollow of the back, or a little below it, but if the patient be not emaciated, and that the spring required be not a strong one, the back pad may be slipped off altogether.

The advantages of this truss may be stated to be as follows:—

1. It is lighter than any other instrument of the kind with which I am acquainted; the average weight of the single truss being about four ounces, or without

(a) p. 103.

the back pad, which may often be dispensed with, 3½ ounces.

2. From its lightness, small size, and close fitting to the person, when properly adapted and applied, it is worn by the patient almost without his being aware that he has such an instrument on him; and it is imperceptible under any dress—a matter of some importance with Military Officers who wear the shell jacket.

3. It is simple in its construction, and therefore of comparatively low price, and easily altered or repaired by any ordinary mechanic. "A simple instrument," says Lawrence, "when well made, answers every end which can be accomplished by more complicated ones, and is therefore preferable for reasons that must be obvious." (a)

4. The rupture pad, being of hard wood (box-wood is the best) is imperishable, as it does not absorb the perspiration, and will not chafe or excoriate the skin, (as may be seen by a reference to testimonials No. 6 and 7, &c.); if preferred, however, this pad may be covered with a cap of chamois leather or flannel, renewable at pleasure.

5. A material advantage derivable from the wooden pad, is the facility with which it can be modelled, or altered, or a new one made, by any handy person, to the size or form required for any particular case; when the pressure, for instance, is to be made on any one particular spot, the pad may be more rounded; if the pressure is to be general, it should be flatter; when the hernia is old, and the protrusion takes place near the pubis, the pad should have something of a triangular shape; or if the hernia be what is called, "direct," the pad may be modelled with a rounded prominence or nipple on any required part of its face, in imitation of M. Malgaigne's mushroom pad. This nipple being applied exactly to the spot where the protrusion takes place, fills up the aperture like an operculum, and effectually prevents any protrusion of the bowel. (b)

(a) p. 100.

(b) A few months ago a soldier of the 30th Regiment was sent to Fort Pitt to be discharged the service on account of the largest

6. By the small size of the anterior or rupture pad, as compared with those of most other trusses, and the place it occupies when properly applied, the spermatic chord is effectually preserved from injury; and the pressure being made on the inguinal canal, and the upper hernial opening, instead of the lower, there is no pressure on the pubis, nor is there any danger of strangulation or injury of the gut within the inguinal canal.

7. The perineal strap is not required with this truss, unless in some rare case where the pubis is prominent, and the belly flat and receding, giving a tendency to the truss to slip upwards.

8. By a trifling modification of the anterior curve of the spring, and a slight alteration in the shape of the wooden pad, the truss is equally applicable to a femoral, as to an inguinal, hernia; and has been worn by many female patients with the greatest efficiency and comfort. (*a*)

Before detailing the directions for the application and fitting of the instrument, I must beg to prefix a few remarks in relation to the point of pressure. "Many Surgeons," says Sir A. Cooper," and almost every Surgeon's instrument maker, have thought proper to vary the form of the truss, and to prescribe different

scrotal hernia I had almost ever seen. The tumour descended nearly to the knee; and the volume of intestine it contained was so large, and the force with which it was protruded so great, that it was found almost impossible to return the contents of the sac to the abdomen; and, when up, it was thought by Staff-Surgeon Ford, and others who saw the rupture, impossible to retain by any mechanical contrivance. A truss, however, with a wooden pad, such as above described, having a nipple near the centre, which exactly fitted the hernial aperture, was applied, and the support afforded was so complete and effectual, that no exertion the patient could make, could disturb the instrument or bring down the rupture; and the patient has since declared himself as fit for any duty as he had ever been in his life. Another case somewhat similar has presented itself at Fort Pitt within the last few weeks. A soldier of the 12th Regiment, affected with a very large scrotal hernia of 14 years standing, which no truss could support, has obtained complete and effectual relief from the use of one of my trusses, having a pad modelled as above described.

(a) vide Testimonial, No. 32.

rules for the duration and force of the pressure, but almost all have agreed in determining that the pressure should be made on the abdominal ring.

"This is precisely the circumstance, however, in which they are all defective; and indeed it is the frequent failure of the purpose for which they are designed, when made according to this principle, that has led to such a variety in the mode of their construction. The object in applying a truss is to *close the mouth of the hernial sac*, and destroy its communication with the abdomen, and this object can never be perfectly fulfilled by any truss which is applied in the usual manner upon the abdominal ring, and extending from it upon the os pubis. In this case the cure must be incomplete, because a considerable portion of the hernial sac remains uncompressed towards the abdomen, which portion is that situated between the abdominal ring and the opening of the sac into the cavity of the belly." (*a*)

"The proper method," he says again, "of completely obliterating the mouth of the hernial sac is to apply the truss, not upon the abdominal ring, but upon the part at which the spermatic chord, and with it the hernia, first quit the abdomen; for in this way only can a descent of the hernia be entirely prevented." (*b*)

Mr. Lawrence, on the same subject, adds—"The pad of the truss should be placed over the opening at which the viscera have protruded; hence in a small or recently-formed inguinal rupture, the proper position for it is considerably exterior to the pubis, and rather above that bone." (*c*)

The foregoing quotations from the works of those distinguished Surgeons leave nothing for me to add on this important point, I shall therefore proceed at once with directions for the application of the truss in inguinal hernia.

If the hernia be recent and of small size, the erect position is the easiest for applying the instrument. When the hernia is large, or with difficulty reduced or

(a) p. 14. (b) p. 15. (c) p. 101.

sustained, let the patient be laid on his back, and the hernial sac with its contents be carefully returned. Now place the truss on the affected side, with the leather pad over the top of the sacrum and lower lumbar vertebra: feel for the upper opening through which the bowel protrudes, and on this spot lay the rupture pad. (a) Then draw the instrument close round the hip; pass the strap round the opposite side, and loop it on the button screw on the front pad; do not, however, draw it too tightly, else the pad will be dragged forward from its place (which should be close to the upper part of the fold of the groin, in the hollow above the ramus of the pubis and ischium) taking care that it does not press on the bone, or on the spermatic chord as it passes over it.

In measuring a patient for a truss, the girth of the body round the hips (about two inches below the anterior superior spinous process of the iluim) is to be given in inches. It should be stated whether the patient be stout or thin; and whether the spring should be a weak or a strong one; it must, however, be borne in mind that, even with the most careful directions, there must always be a doubt as to the fitting a patient accurately, with any description of truss, unless there be an opportunity of selecting from a number of instruments, or unless the patient be measured and seen by the maker himself.

The spring, anteriorly, may be lengthened or shortened half an inch, by removing the pad, and screwing it on one hole lower down or higher up; or the pad may be screwed on the spring the reverse way, that is, with the base or larger end up, and the apex down (like the pad of L'Estrange's truss) so as to bring the chief force of the pressure on the inner ring alone. In some cases this will be found to answer better, at all events if there be any difficulty the experiment may be tried.

(a) Mr. L'Estrange of Dublin, the patentee of a very ingenious truss, was, I believe, the first to bring to the notice of the public an instrument constructed specially with a view to the making of pressure on the internal ring. Dr. Tod, of London, has also a truss on this principle.

TESTIMONIALS.

It will be observed that the following are not theoretical opinions, but are the Certificates, for the most part, of persons who have had *practical experience* of the working of the truss:

No. 1.

Fort Pitt, Chatham,
11 July, 1846.

Proceedings of a Board of Medical Officers held by order of the Director-General of the Army Medical Department, to report upon a truss for inguinal hernia invented by Staff-Surgeon Dartnell, as to its claims as compared with the trusses hitherto in use.

PRESIDENT:
Dr. FRENCH, Deputy Inspector-General of Hospitals.
MEMBERS:
Staff-Surgeon FORD.
Surgeon PIPER, Provisional Battalion.

The Board have seen satisfactory trials of the truss, made in this and the Detachment Hospitals, and are satisfied that it is the most efficient instrument of the kind they have seen; and in their opinion is peculiarly adapted for general use in the Army. The truss is strong and durable, and so simple in its construction that it may without difficulty be made or repaired by an armourer-sergeant; and is, in the opinion of the Board, calculated to give the most perfect security, as well as greater comfort than others, to the wearer,

(Signed) J. FRENCH, M.D.
Principal Medical Officer, President.
WM. M. FORD,
Staff-Surgeon, 1st Class.
SAML. PIPER, M.D.
Surgeon, Provisional Battalion.

No. 2.

Fort Clarence, Military Prison,
18 March, 1846.

My dear D—,

I have tried your newly invented truss upon a case in Fort Clarence, and I am happy to say with the most marked success.

The patient has an old standing double rupture; that on the left side being very large, and so unmanageable that all trusses hitherto tried by him have failed in keeping it reduced under the most trifling exercise. With your truss, however, the hernia is com-

pletely prevented from protruding, and he feels a degree of security that he never experienced before from any other truss.

Believe me, yours, sincerely,
H. PILLEAU,
Assist.-Surgeon to the Forces,
in Medical charge of the District Military Prison.

No. 3. Plymouth,
21 May, 1846.

My dear D—,

To-day I examined Hancock, and find that he has continued to wear your truss ever since he rejoined from Chatham, and the improvement, since he left this to be invalided some months ago, is most marked. He says that the truss retains its place under all circumstances, and fits easily, but after being on duty all day, he sometimes finds it necessary to take it off for a short time at night, as the continued firm pressure becomes uncomfortable; this is owing to the spring being strong, but its strength is not greater than is necessary in his case.

The common truss, with its spring passing all round the body, is very unfitted for the soldier, because when he lies down on a guard bed, the instrument is pressed from its place and the rupture descends.

The duty of this Garrison is more severe perhaps than that of any other in England, the guard posts being at considerable distances, and the men having barely two nights in bed: if Hancock therefore continues effective, as he has done, for a few months longer, your truss will have undergone as severe a trial of its fitness and efficiency as can well be required.

Believe me, yours, very sincerely,
WILLIAM WALLACE,
Surgeon, 14th Regiment.

No. 4. Parkhurst Barracks, Isle of Wight,
11 June, 1846.

Sir,

In reply to your letter of the 1st instant, relative to Private Benjamin Gooch, of the 12th Regiment, who was fitted with a truss of a particular description some months since by you at Chatham, I beg to say that the truss in every respect answers the purpose effectually, the hernia, as he states, never having protruded in the least since he began to wear it.

The hydrocele with which the hernia was complicated, and which was relieved by you, is now returning, and will no doubt in a little time require operation again: the man is, in every other respect, an efficient soldier.

I have the honor to be, Sir,
Your obedient servant,
R. DOWSE,
Staff-Surgeon in charge of Depot Batt.

No. 5. 7, Ordnance Terrace, Chatham,
14th July, 1846.

My dear Sir,

I have much pleasure in acquainting you that the truss has been altered as you suggested, it now fits beautifully, and is everything I could possibly wish, being a great relief from the heavy instrument I had been in the habit of wearing. I think the box-wood pad (in place of that made of beech) an improvement, particularly for those whose skin is tender.

Those afflicted with hernia owe you a lasting obligation for the trouble you have taken to bring the truss to such perfection.

I have had the curiosity to weigh the two instruments, and I find there is a difference of three ounces (being nearly double), yours weighing five and a quarter ounces, and that which I have discarded eight and a quarter. I could never bear this on the whole day from the great pressure upon the bone; with yours I have no difficulty of this sort, and at the same time feel perfect security. I shall be most happy at any time to bear testimony to the efficiency of the instrument to any person who may wish for a reference to one who has worn the truss for some time.

Believe me,
My dear Sir,
Yours, truly obliged,
H. JAMES.

No. 6. Gravesend,
21 July, 1846.

My dear Sir,

I had not lost sight of your request to look after Private Knuckle (with large scrotal hernia of left side). I have examined his truss several times, and find that it fits well and easily, without undue pressure anywhere, and has perfectly retained its position.

Yours, my dear Sir,
Very truly,
J. NEWTON,
Staff Assistant Surgeon.

No. 7. 7, Ordnance Terrace,
10 August, 1846.

My dear Sir,

I think I have now given the box-wood pad to your admirable truss a good trial, and in my humble opinion it is perfection. I have not found the slightest rising of the fibres of the wood from the heat of the body or perspiration, and consider that the most delicately skinned person could not feel inconvenience from wearing the truss with a box-wood pad.

Believe me,
My dear Sir,
Yours most truly,
H. JAMES.

No. 8. Fort Pitt,
24th May, 1847.

I hereby certify that I have inspected Private Pearman, 63d Regt. who was furnished with a double solid-pad truss at Fort Clarence above a year ago, and find that the truss still fits well and comfortably: that the rupture has never descended, and that he has continued to perform all the duties of a soldier in this Garrison ever since the truss was applied.

(Signed) J. FRENCH, M.D.
Principal Medical Officer.

N.B.—This is the case alluded to in Testimonial No. 2.

No. 9. Keppel Street, London,
17 June, 1847.

My dear Sir,

The poor man who had been suffering so much from the inefficiency of his truss called on me yesterday. He has been using your truss since it was put on him at Chatham, and I am happy to say with the best result. He says he has begun to work, which he was unable to do since I operated on him some months ago for strangulation of the rupture. He feels no pain or uneasiness from the instrument.

I hope you will make an arrangement with some instrument maker here respecting the truss; and that you will turn your attention to one for females.

I am,
My dear Sir,
Faithfully yours,
(Signed) R. QUAIN.

No. 10. Cavalry Depot, Maidstone,
20 Oct. 1840.

My dear Dartnell,

I send to you Corporal Batty, 15th Hussars, an intelligent, steady, and good soldier, who has worn one of your trusses for inguinal hernia during the year, perhaps with more attention than is always given to such matters in the Army, as he is anxious to remain in the service. He is therefore a fair specimen of what a good principle, even although but indifferently worked out by the mechanist, is capable of producing.

It has not interfered with his duties during the year: he has been often mounted, always employed, and I take him from that most trying muscular work, the sword exercise, to send him to you.

I think adhesion has taken place at the internal ring, but lest I should influence your opinion on the case, I shall only add that, if you think there is a chance of the hernia descending again, I have

to request that you will obtain for him another truss on the same principle, but with a lighter spring than the one he now wears. *

Believe me,
My dear Dartnell,
Yours very truly,
(Signed) ALEXANDER SMITH,
Staff-Surgeon, 2d Class.

* This man was supplied with another truss having a very light spring: was soon after considered to be radically cured of his rupture, and sent out in the Spring of 1848 to join his Regiment in India, as a perfectly effective Dragoon.

No. 11. (Extract from the MEDICAL TIMES.)

"This simple and economical instrument has for nearly two years been extensively employed in the Army, and has been spoken very favourably of by many Military Surgeons who have used it. It seems particularly adapted for general use in the Army, and will, we think, be found by civilians afflicted with hernia, an instrument superior to those commonly used."

No. 12. Rochester,
6 June, 1848.

My dear Sir,

Several of my patients have now made trial of your truss; and all of them speak strongly of the comfort and effectual support afforded by them. Their good qualities, and the great diminution of price, have determined me always to recommend them in preference to any others.

I am,
My dear Sir,
Yours truly,
(Signed) GEO. E. ELY, M.D.,
Surgeon Medway Union.

No. 13. Edinburgh,
24 August, 1848.

My dear Sir,

I have to thank you very much for the truss, the merits of which I shall have much pleasure in making known to my colleagues in Edinburgh, and to my pupils during the ensuing Winter session. The truss I propose to deposit in the little Museum attached to the class of Military Surgery in our University, which contains many valuable contributions from the Medical Officers of the Army.

I have now little or no opportunity of testing the merits of your invention personally, but I like the common-sense principles of its

construction, and am quite satisfied with the favourable opinion expressed of it by my excellent friend, French, whom I hope to see before he leaves Scotland.

Believe me,
My dear Sir,
Very truly yours,
(Signed) GEO. BALLINGALL,
Professor of Military Surgery.

To Staff-Surgeon Dartnell.

No. 14. Detachment Hospital,
Brompton Barracks,
2 Sept. 1848.

My dear Dartnell,

It is but justice to you to state that, being much pleased with the principles and construction of your truss, we felt it our duty to express the same to the Principal Medical Officer, Dr. French. We have now great pleasure in again recording our opinion, and have no hesitation in saying that the truss invented by you far surpasses everything of the kind we have ever seen, in utility, lightness, durability, and comfort to the wearer.

We have had it tried here upon a large scale, and all the men to whom it has been supplied have uniformly expressed the greatest satisfaction in its use, and the easy and comfortable support it has afforded them.

Believe us to be,
Yours very truly,
(Signed) J. F. PINK,
Surgeon Provisional Battalion.
A. MACLEAN, M.D.,
Staff-Surgeon 2d Class.

No. 15. Aberdeen,
24 October, 1848.

My dear Sir,

I have great pleasure in informing you that I am much pleased with the principles and construction of the truss invented by you, and that I have determined on recommending the use of it by my patients. It has the excellent qualities of lightness, durability, and admirable adaptation for affording effectual support.

I beg your acceptance of the accompanying copy of my paper on Herniotomy.

Believe me,
My dear Sir,
Yours very sincerely,
(Signed) WILLIAM PIRRIE,
Regius Professor of Surgery,
Aberdeen.

To G. R. Dartnell, Esq.,
Staff-Surgeon.

No. 16. General Hospital, Fort Pitt,
1 Nov. 1848.

While stationed at Fort Pitt, for a period of twenty months, I have had many opportunities of applying the truss invented by Staff-Surgeon Dartnell, as well as of observing its effects in numerous cases of inguinal rupture; and in every instance its application was successful, and gave the utmost satisfaction to the wearer.

I have also had opportunities of employing it in children with the most favourable result, where common trusses utterly failed.

From its small and convenient size, trifling weight, and durable material of the rupture pad, its merits in tropical climates cannot be over rated.

(Signed) W. DENNY,
Staff-Surgeon 2d Class,
In charge of Government and Compassionate Female Hospital.

No. 17. Chatham,
3d November, 1848.

My dear Sir,

I have much pleasure in reporting to you that my opinion of your solid-pad truss continues unaltered. It is the most perfect instrument for enabling a patient to sustain the evils of hernia with which I am acquainted. I have used it both in old and young persons with the very best results.

Believe me,
My dear Sir,
Yours sincerely,
(Signed) ARCH. ROBERTSON,
Surgeon.

To G. R. Dartnell, Esq.,
Staff-Surgeon.

No. 18. Chatham,
4 Nov. 1848.

Sir,

Having unfortunately ruptured myself about ten months ago by a trial of strength, I was fitted within two months with patent and other trusses by different makers, but the rupture being unsupported by any of these, I was recommended to try one of your improved trusses. I did so, and am happy to say that I have not only experienced from this instrument the greatest possible ease and comfort, but believe it has already effected a permanent cure. I have continued to wear the truss night and day, and the rupture has never descended since it was first put on in March last.

Within the last few weeks I have joined Earl Darnley's Troop of

Yeomanry Cavalry, and believe myself now to be as sound and efficient a horseman as I was before the accident occurred to me.

I remain,
Sir,
Yours respectfully,
(Signed) SAMt. MORRIS.

To G. R. Dartnell, Esq.,
Surgeon to the Forces.

No. 19.

Chatham,
5th Nov. 1848.

My dear Sir,

I have much pleasure in testifying to the fact that your truss in my opinion far surpasses in simplicity, lightness, and efficiency any instrument of the kind I have ever seen.

Several of my patients have now been wearing your trusses for a considerable time, and all acknowledge the great comfort and relief they have experienced from the very first day of their application, and being since enabled, with perfect ease and security, to pursue their ordinary avocations, which in many instances are of the most laborious description.

I remain,
Faithfully yours,
(Signed) E. A. STEDDY,
Surgeon.

To G. R. Dartnell, Esq.,
Staff-Surgeon.

No. 20.

Chatham,
11 November, 1848.

Dear Sir,

It is with much pleasure I have to inform you of the benefit my son has derived from wearing your truss.

He became ruptured about twelve months since, and finding after a time that the truss we procured for him caused considerable uneasiness, we applied one of yours ; and from that time to this he has worn it night and day ; and is able to take any amount of exercise without appearing to be in the slightest degree uncomfortable. The ruptnre has never descended, and I have every reason to believe that it is a permanent cure. The child is now nearly seven years of age.

I am,
Dear Sir,
Yours much obliged,
(Signed) THOS. HOLLICK,
Druggist.

To G. R. Dartnell, Esq.

No. 21.

Military Prison, Fort Clarence,
30 Nov. 1848.

My dear Sir,

I have taken every opportunity this Prison affords of testing the merits of your truss, and I have much pleasure in informing you that, when well fitted, I consider it far superior to those in common use in the army, and much preferred by the soldier from its lightness, efficiency, and the freedom of motion it allows the wearer.

I am also happy to inform you that, in one case, where a young Artilleryman in this Prison ruptured himself in hastily and carelessly lifting a 32lb. shot, your truss succeeded in effecting a radical cure.

The truss was applied on the 5th of August, and the prisoner was released and discharged to his duty on the 10th of October, with every indication of a permanent cure. I again saw him on the morning of the 11th instant, and found my former opinion completely confirmed.

I remain,
Very truly yours,
(Signed) E. KELAART, M.D.
(Vide No. 22.) Surgeon Military Prison.

No. 22.

Royal Ordnance Hospital,
Chatham,
5 January, 1849.

My dear Sir,

I have to inform you that gunner and driver Charles Snook, of the 10th Batt. Rl. Artillery, who was ruptured while at shot drill in Fort Clarence Prison, in the beginning of August last, is at present cured. He continued to wear your truss for three months, but for the last six weeks has performed all duty without it, and there is no protrusion of the intestine whatever.

I remain, my dear Sir,
Yours very truly,
(Signed) T. H. QUIGLEY,
G. R. Dartnell, Esq., Senior Surgeon,
Staff-Surgeon. (Vide No. 21.) O.M.D.

No. 23.

14, Saville Row, London,
31 March, 1849.

My dear Sir,

I am very much obliged by your kindness in sending me a specimen of your new truss. It certainly seems very probable that there may be much advantage in having the power to alter the figure of the pad so as to adapt it to the various kinds of hernia.

I shall be very glad to avail myself of an opportunity of trying the truss,

And am, dear Sir,
Your faithful servant,
(Signed) B. C. BRODIE.

(No. 24)

16 August, 1849.

My dear Dartnell,

I am very happy to state that I highly approve of your truss, and consider it to be the best I have yet met with ; its neatness, compactness, and efficiency, rendering it invaluable.

In all cases in which I have used your truss I have found it to answer remarkably well, and to give the patient great comfort.

A friend of mine, for whom I procured one of your trusses, assures me that he likes the truss very much and derives great comfort from it. He is enabled since he got it to ride a good deal, also to play at cricket, and other athletic exercises, and finds no inconvenience whatever from the truss when it is properly applied and secured.

Believe me,
Yours sincerely,
(Signed) JOHN DAVIES,
Surgeon 49th Regt.

No. 25.

Chatham Barracks,
8th October, 1849.

My dear Sir,

I have had repeated opportunities of seeing your new truss in use on soldiers in this Garrrison, and have no hesitation in declaring that for comfort, portability, and the rendering of efficient support in cases of hernia, it is far superior to any instrument of the kind I have seen ; and is infinitely preferred, by all who wear it, to any other.

I remain,
Dear Sir,
Ever faithfully yours,
(Signed) G. H. BLAKENEY,
Staff-Surgeon, 2d Class,
attached to Pro. Batt.

To Staff-Surgeon Dartnell.

No. 26.

General Hospital, Fort Pitt,
17th October, 1849.

My dear Sir,

I have much pleasure in bearing my humble testimony to the superior merits of your improved truss, which my position in this establishment has given me such ample means of judging of during the last three years.

I may also add that, an old and intimate friend, who has been afflicted with a double hernia for upwards of 30 years, and for whom I obtained one of your trusses about a year ago, authorises me to express to you, in the most unqualified terms, the great comfort he has experienced from it, especially in contrast to the heavy and inefficient one he had been wearing before. I have reason to believe that he is now permanently cured on one side by the use of your truss, and from the rupture on the other side, which was large and troublesome, he now feels no inconvenience whatever.

Believe me, my dear Sir,
Yours very truly,
(Signed) J. LEWIS,
Surgeon, H.P.
In charge of Medical Stores.

G. R. Dartnell, Esq.,
Staff-Surgeon.

No 27.

Mem.—Surgeon Power, 91st Regiment, since dead, in speaking of my truss, soon after his arrival from the Cape some months ago, told me that he had used it with some of his men when employed on active service in the field, and that he had found it to "answer admirably."

GEO. R. DARTNELL.

No. 28.

Fort Pitt, Chatham,
21st Nov. 1849.

My dear Sir,

I have had numerous opportunities of testing the merits of your truss whilst doing duty in this hospital. It appears to me to answer the purposes for which it is intended most admirably.

It is in itself light, and of durable material. It affords most efficient support; indeed in this respect, I have known it succeed in cases where those constructed on different principles had totally failed. I would recommend it also on the score of comfort; and soldiers who have worn your truss, after trying those made by others, invariably give yours the preference.

I remain, my dear Sir,
Yours truly,
(Signed) J. ROSS JAMESON, M.D.
Staff-Surgeon, 2d Class.

To Staff-Surgeon Dartnell.

No. 29.

Nov. 22, 1849.

I have great pleasure in bearing testimony to the value of Staff-Surgeon Dartnell's modification of the truss for the relief of hernia. I have witnessed its application in many instances wherein it was productive of great comfort to the patient, who had, without relief, been previously using instruments less adapted to effect the purpose designed.

Further, I have seen this truss effective in retaining a rupture within the abdomen, which had been considered incurable by more than one Surgical Practitioner, and which had consequently been permitted to remain in the scrotum until it had attained a very great size.

(Signed) THOMAS SPENCE, M.D.,
Staff Surgeon
in charge of Medical Division,
General Hospital, Fort Pitt.

No. 30.

Fort Pitt,
Dec. 5, 1849.

My dear Sir,

I have great pleasure in stating that while in charge of the Medical Stores at Quebec, I issued your truss very generally throughout the Command, and have every reason to believe that it everywhere gave satisfaction.

Of the cases which have come under my own observation, I can say the same; and only a few months since I applied it in the case of a soldier's wife, an elderly woman, very stout, and with a large inguinal hernia, which has given her no trouble since.

Very truly yours,

(Signed) J. D. MACDIARMED, M.D.,
Staff Surgeon, 2d Class,
in charge of the
Female Hospital.

G. R. Dartnell, Esq.,
Staff Surgeon.

No. 31.

I have been in the habit for this last twelve months of using Staff-Surgeon Dartnell's trusses for hernia, and in all cases my patients have expressed their comfort and ease in the wear of them, and the facility with which they keep their position; and so far as my experience goes, I do believe them superior to all other trusses now in use.

(Signed) E. EDWARDS,
Surgeon.

Strood,
Dec 6, 1849.

No. 32.

Fort Pitt, Chatham,
Nov. 22d, 1849.

Since my arrival here in Oct. 1848 I have had many opportunities of testing the qualities of Staff-Surgeon Dartnell's Rupture Truss amongst the numerous invalids sent from Home and Foreign Stations to this establishment. No other truss is now used by the Military at this station; and I am of opinion that it is as near an approximation to a perfect truss as can be made.

With a slight modification I have seen Mr. Dartnell's truss used in a case of femoral hernia with great comfort and advantage.

(Signed) W. HENRY,
Deputy Inspector General,
Principal Medical Officer.

CADDELL AND SON, PRINTERS, GAZETTE-OFFICE, ROCHESTER.

Saline treatment

SOME NEW VIEWS

RESPECTING

ASIATIC CHOLERA.

BY

ARTHUR LEARED, A.B., M.B.

"——— Quod medicorum est,
Promittunt medici"

Hor. Epist.

London:
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WILLIAM HENRY COX,
5, GREAT QUEEN STREET, LINCOLN'S INN FIELDS.

SOME NEW VIEWS

RESPECTING

ASIATIC CHOLERA.

AMONGST the numerous and dissimilar scourges, bearing the general name of epidemics, which, from time to time, since the remotest ages, have devastated nations and depopulated their cities, there is none whose history is fraught with more direful details, and whose advances have been more clearly defined by some physical agency, however remote, than that to which the name of the Epidemic, or Malignant Cholera, has been assigned.

The first of these assertions requires no confirmation; there is scarcely a locality upon the face of the habitable world but can, more or less, bear melancholy testimony to its truth; and for the second, we have only to refer to its remarkable *trajet* in a westerly direction, from its origin in India, and its arrival at given places, in close accordance with the predictions of European observers. To this we may add, the inefficient attempts to check, or even suspend, its progress by quarantine, or similar regulations of civil policy; and the equally ineffectual obstacles which the occurrence of mountains, rivers, seas, and even the ocean itself, have presented to its inroads. The vicis-

situdes of climate, and the apparent variations of the atmosphere, and other circumstances which are usually regarded either as barriers or promoters of disease, leave us no data upon which we can proceed, and afford us as little light in the obscurity in which the subject before us has been involved.

That all these matters have received the attention which the importance of the subject required, there can be no doubt; perhaps, even in this respect, it is unparalleled. The number of treatises upon Cholera which our public libraries afford, is absolutely prodigious; and the different theories of its production, and modes of treatment founded on these preconceptions and exclusive doctrines concerning it, almost as many; yet, strange to say, still it continues to be the *quæstio vexata* of our age, and its recent advances in a direction similar to its former memorable one, is again attracting painful observation of its onward career.

To avoid prolixity, and the imputation of uselessly repeating what is already well known, or, as has been the case with too many, of aiming at some new and startling theory about to be brought before the world, which was destined to supersede all its predecessors, the author will at once state his views upon the subject of investigation, together with the plan he has adopted in the prosecution of his inquiry. At the same time, premising that the remarkable discrepancy of opinion respecting the matter of which he is about to treat, sufficiently proves the difficulties which beset his path; and that to the scientific speculator, as to the patient and perhaps more useful labourer in the

field of practical treatment, it must still be considered an open subject.

There is, however, another course, a sort of medium, which, it is to be hoped, will not be thought objectionable, namely, an attempt to draw from the investigations of others such inferences as may lead to some right conclusions; for it is hardly to be conceived, that in the midst of the vast mass of information that we possess on the subject, that there is not a good deal of this desirable ingredient, even though involved within mazes of error. It forms no part of the author's plan, however, to enter upon any details unconnected with his immediate object. Although numerous catalogues *raisonné* of Cholera, professing to give its phenomena and its treatment, but in a manner desultory and incomplete, have already issued from the press, even these he considers a desideratum; but from such a task, considering the wideness of the range over which the material is diffused, had he either time or inclination for the effort, he would almost shrink in despair. The utility of a more complete compilation than has yet appeared, he infers from the facts, that not only would it arm the practitioner, in case of a future invasion of the malady, with the doctrines of its most successful combaters, but would be likely to preclude, in many instances, further and unnecessary experimentalizing, with the vain hope of discovering thereby the long sought Εφηκα, a specific, or, at least, dependable treatment. That an efficient book of reference would promote these desirable ends there can be little doubt; for fertile, indeed, must the invention be, that could

devise a new mode of treatment or view of the disease, that would not be too often found (however strenuously supported by their advocates at the time) already stereotyped in these recorded annals, as abortive or illusory. But it would also subserve to another end, in the opportunity thus afforded in the hands of many, of comparing the labours and experience of others with their own, and of elucidating in this manner, by a process closely allied to the operation of the inductive sciences, some most important facts in connection with the subject.

It is manifest, that the more we can bring it within the pale of demonstrative evidence, particularly in unravelling the devious and often almost hopelessly obscure connection between cause and effect in relation to disease, the more do we assimilate our noblest of arts, and the better can we claim kindred to what have been termed by contradistinction the exacter sciences; and every attempt to determine even a single link in this vast chain, provided the task be approached in the proper spirit, with the mind unclogged with prejudice on the one hand, and unfettered from the paltry motives of upholding particular doctrines, from a consideration of private ends, on the other, may fairly claim commensurate attention, since even a single fact which it may have succeeded in establishing, may prove the future pivot upon which others of far greater importance are destined to depend.

Of all the means employed to accomplish this desirable purpose, none have been attended with more satisfactory results than those afforded by morbid anatomy. Through careful study of this subject,

some of those remarkable changes of structure are rendered manifest to the senses, that, taken in connection with pre-observed phenomena, by a species of retrograde reasoning, enables us to infer their existence in the living organism. Take, for example, that of Phthisis Pulmonalis. With this disease, it is not so long since, that many less grave ailments were ruthlessly confounded; now, however, not only may we be said to have approached its more remote cause, in the light thrown upon the minute conformation of the tuberculous deposits, but, taking into account a further sequence and their rational effect, to quote the words of an accomplished writer upon the subject, "by, as it were, turning the ear into the eye," in the use of the stethescope, we are enabled to predicate the certain existence of the latter, and to distinguish the former as a disease from every other.

The collateral sciences, and chemistry in particular, as directed of late to the examination of the organic world by the distinguished Liebig, have readily contributed their respective quotas; and of its practical application in our own country, what better instance can we select than its original adoption by Dr. Bright, to ascertain the *causa mali* in certain hitherto obscure renal affections.

That there are some diseases that will always defy our closest scrutiny and best directed efforts, by the foregoing, or any other like available methods, is certainly not improbable, particularly those included in the protean class of the neuroses; and it is in reference to these that the principle of induction, as a sole, and not merely an auxiliary reliance, as in some cases,

should be more vigorously prosecuted; so that by a systematic grouping and combination of particulars, such a mass of general facts might be collected as, by their further comparison, would lead to inferences no less valuable than those established upon more tangible evidences. Yet it is to be feared that this useful aid has been, in its application to medicine, but too much neglected.

It has been already hinted that there are few diseases which, from the number and authenticity of its records, present fairer opportunities for exercises of this sort, than the Epidemic Cholera. Most of them have also the recommendation of being of very modern dates, so that their authors have themselves possessed the advantages, which the more recent advances in medical doctrines might have supplied them. The present intention of the author partakes of this nature; at the same time, for the sake of brevity, choosing rather the broader and more recognized features of the disorder, it is not his purpose, in every instance, to adduce individual testimony in support of such arguments as he may advance; while he would venture to add what, perhaps, may afford some claim upon the indulgence of his readers, that his knowledge of the disease consists in somewhat more than is to be found within the precincts of a library.

It is strange that the remarkable similarity between the effects and symptoms of excessive hæmorrhage and of Epidemic Cholera, should not have attracted greater attention amongst writers on the subject. Many have written voluminous works without even alluding to so notable a circumstance, and Dr. J. Johnson seems to

have been the first who has openly asserted the close connection between them. He says, "From an attentive observation of Cholera, as it appeared in England, I am perfectly satisfied that the disease is a serous hæmorrhage from the bowels, that is, that the serous part of the blood is drained off from the internal surface of the intestinal canal, till the powers of life are worn out, or the remaining blood becomes too thick to circulate. This is the only view of the disease that can account for the greater number of the symptoms, and the fatality of the malady. Men die of Cholera precisely in the same way as from hæmorrhage; shrinking, paleness, and *coldness* of all external parts, —even of the *breath*, with spasms, the invariable attendant on severe hæmorrhage."* In this he has been followed by some subsequent writers, but usually more in the mode of a tacit acknowledgment or recognition, than of attributing to it the importance which so leading a feature in the disease would appear to require. Let the above extract from this able writer be compared with the well known effects of great losses of blood, and can any fail to be struck with the coincidence? That certain differences should exist, is perhaps the rather to be expected, when we reflect that in ordinary hæmorrhages, whether from mechanical injury, or originating in diseased or irregular action, the effects to be looked for are such as bear a relation between the loss of the circulating fluid which has been sustained, and the amount of it remaining within the system; while in Cholera, the relation of the same will be to the loss of its more fluid portions, and

* *Johnson and Martin on Trop. Climates.* Sixth edit. P. 345.

the residue containing the whole, and, consequently, an undue proportion of the grosser components. It is also to be taken into account, that the former being frequently the result of the lesion of a considerable vessel or number of vessels, and of comparative local operation, are, on this account, more likely to cause sudden disturbance of equilibrium, and that, therefore, the effects of the deranged circulation, will vary from that in which the extensive intestinal surface is the medium of effusion. We find, accordingly, that syncope, one of the most common sequences in hæmorrhages, is rarely seen in Cholera, while, on the other hand, in the latter, we find more strongly marked the more partial failure of vitality, and the apathetic state of the patient's mind to impending fate; the more complete shrinking of the surface, from the desertion of the contained fluids, and its greater coldness and clamminess, together with other conditions connected with an alteration in the blood, and strongly indicative of an impeded circulation of this important fluid, owing to its unwonted viscidity and unfitness in relation to an essential condition of hydraulic motion, for propulsion through the minuter channels. In this, too, it is reasonable to suppose, is to be found a solution of the appearance so characteristic of the disease, as to have given it the appellation of the Blue Cholera, from the fact of the nails and general surface usually assuming, even during life, a livid or bluish colour; for it seems a fair inference, that pending the unwonted commotion taking place in this elaborate compound, by which it is in some measure resolved into its separate elements, that after the repeated efforts of the

systemic apparatus to sustain its important functions under so serious and increasing an interruption, that the globular or coloured portions, partly from want of the requisite *vis a tergo*, and partly owing to their own want of fluidity, from the abstraction of their appropriate medium, at length become clogged in the superficial capillaries, and thus affording an abnormal intensity of colour, are the efficient cause of the peculiar and unpromising aspect; and that this would hold good, more particularly with regard to the extremities, requires no further comment.

The greater number of authorities on the subject have remarked the centralization of the blood, as shown by post mortem examinations, particularly of the portal system, as palpably evidenced by the distension of the larger vessels, and also in the extraordinary injection of its minuter channels, as seen on the internal surface of the digestive cavity. But without at present entering upon any investigation of the obscure cause of these phenomena, and alluding merely to the facts, that the nature of their contents appear amply corroborative of the opinion with regard to a singular feature in the disorder, the separation of the blood into distinct portions uniformly presenting the dark, tarry-looking characteristic, while those of the intestines, unless where they have been altogether removed by the consecutive purging and vomiting, afford the more or less limpid, whey, or *congée* water appearance. We shall now offer a few remarks as to the proximate cause of the disorder itself, which we do not hesitate to say is to be found in the circumstances which have

been stated—the disturbance in the balance of the general circulation, with accumulation and eventual cessation in that of the portal system throughout its complicated connections, attended with separation and extensive loss of the serous part of the blood.

The remarkable suspension of the secretions, which so universally occurs, seems to take place, especially in the case of those organs which are provided with vessels of a considerable size, and whose distribution evidently has relation to the secerning functions of the parts to which they are distributed—thus, the bile, the urine, the saliva, and probably, also, the pancreatic and gastric juices (the latter may be inferred from the undigested condition of the injesta pending the disease) are found to be remarkably deficient,* while the cutaneous exhalation and sweat are apparently so far from being arrested in Cholera, that their presence, to an unnatural amount, is a very prominent feature, and adds, in no small degree, to the palpable horrors of the disorder. That these should supervene at a moment when the circulating fluid is withdrawn, in a great measure, from the subcutaneous apparatus provided for their elimination, would appear, *a priori*, an anomaly; but, at least, it can be shewn, that in similar conditions of the system, induced by very different causes, and of even partial operation, an apparently uniform

* It is true that it is common to find the gall bladder full; but that the function of the liver is suspended during the disease is a general opinion. The reappearance of the bile in the dejections is always favourable.—See *Johnson and Martin on Trop. Climates*. Sixth edition. Page 308, *et seq.*

effect is the result. Thus, during a sudden withdrawal of the nervous energy, such as takes place in syncope, and during the sway of the depressing passions, which are also attended with a central tendency of the circulation, a profuse cold sweat is a usual concomitant. On the contrary, in the opposite state, that of excitement, and in the more permanent one of fever, in contradistinction to that of Cholera, dryness of the surface is more usual as well as characteristic. Perhaps in accounting for the amount of perspiratory fluid thrown out in the disease in question, there should also be taken into account the suppression of the urine, and the well-known alternation of action between the kidnies and the skin. How far the preservative instinct of the economy to rid itself of *effete materiel*, notwithstanding the drain of its fluids by the gastro-intestinal mucus membrane (but, it is to be re-collected, in an unsecreted form, and, therefore, unlikely to be available in reference to vicarious action) may be conducive to it, it is difficult to say; and we have, however, further to consider whether the fluid poured out upon the skin be the true perspiratory secretion, or, as appears to us, far from improbable, analogous in composition and mode of elimination with that to which we have just referred; the peculiarly cold, clammy sensation communicated to the touch, and the unpleasant odour afforded by the patient's body, are sufficiently distinctive, as every body knows who has experienced them; and the latter, Mr. Thom, in his late valuable and accurate report of the disease, as it appeared amongst our

troops in Scinde, has compared to *the unpleasant smell from blood which had been long drawn*; and, he adds, that "the cold perspiration often exceeded the quantity of fluid poured out by the intestines." From this, it would seem that while the intestinal mucus surface is usually the chief medium employed in effecting the morbid process, the other extensive surface, the skin, is for the most part implicated as well (cases have occurred in which it continued dry throughout), and that occasionally it plays the most active part of either in the mischief which ensues—the direct abstraction of the serosity from the blood. An analysis of the fluid poured out by the skin in Cholera would be interesting; none, that we are aware of, having been as yet published. It is worthy of observation, that notwithstanding the contraction of the surface generally, from loss of the contained fluids, turgescence of the superficial veins has been very commonly remarked; congestion internally being manifestly connected with the separation and abstraction referred to occurring there. With regard to the singular perception of heat at the surface, while to the bystander it feels of death-like coldness, we would refer to some remarks we shall hereafter make upon the still more marked degree in which it is experienced by the patient in the præcordial regions; for if the suggestions with regard to it be admitted in the one, they may with safety also in the other, provided they be acknowledged to depend upon the operation of similar causes in both.

The cutaneous exhalation and sweat are certainly true secretions; but if what we have above advanced

be admitted, that the superficial moisture in Cholera is of the same nature and origin as the fluid thrown out into the digestive cavity, we conceive it to be very possible that the same outlets, namely, the spiral secretory tubes, may be made available in the morbid passage of the fluids of the blood from the capillaries and minute veins, whose functions, under other circumstances, consist in the elimination of peculiar secretions. The sympathy and analogy between the skin and mucus membrane, have been constantly remarked, and that a similarity of action may be the result in Cholera, we think not unreasonable to look for.

But, it may be asked, how it is, that though internal congestion is held to be a main feature of the disease, and suspension of secretion an effect of it, the revelations of post mortem examinations are not more uniform in their testimony with regard to the condition of the organs in question; and that although the right side of the heart, with the lungs, together with the larger vessels appertaining to the visceral circulation in general, are found to be gorged with blood, the surface of the stomach and intestines, the kidneys, and occasionally even the liver and spleen, may present no abnormal appearances whatever. But we believe this by no means inexplicable, when it is considered that although the tendency of the peripheral circulation is towards the gastro-intestinal mucus membrane, where the blood is being deprived of its proper fluids, that meanwhile, notwithstanding so serious a deterioration, the circulation being carried

on as long as it is capable, as has been said, on hydrostatic principles, at length becomes arrested in the superficial and remote capillaries, especially in those of the extremities; and thus, after a deposition of the grosser portions in parts not immediately connected with the preservation of the general vitality, and the imperfect restoration of the relation between the materials of the blood thus afforded, nature would appear to direct the struggling powers of life, as if in desperation, by a withdrawal within a narrower scope for the effort (like a tottering state that is compelled to shake off its distant dependencies, to allow of a concentration of its resources for the exigencies of home) to avert impending dissolution, even at the sacrifice of the parts exterior to the circle, within which her operations have become confined.* In this way, then, is probably prevented the sudden internal congestion of semifluid blood, which must otherwise prove more immediately fatal. While we conceive that the cases of sudden death that have been observed to occur at the outbreak of the Epidemic in particular districts, often unattended by any of its broader features, such as purging or vomiting, are attributable to a stronger or more concentrated operation of the same cause, producing death in the mode referred to, and which, in a milder degree (as subsequently occurs when the disease has raged for a variable interval), would have been attended

* The cessation of the circulation, even in the largest vessels of the limbs, and the marble coldness of the latter, long previous to death, are constantly observed in Cholera.

by the various characteristic phenomena which it displays.*

A *status* of the blood then, commencing in the veins, attended or followed by a disorganization of its components, and the subsequent expulsion of a great part of the latter, by means of the two most extensive surfaces of the body, we believe to be the proximate cause of the various and complicated symptoms which, in the aggregate, have been misnamed Cholera. What is the still more remote cause of these grave disturbances in the previously healthy organism, we shall afterwards venture to offer an opinion upon, at present contenting ourselves with some further remarks on the subject under discussion.

Further; in this arrest of the circulation, that the portal system, in addition to its being the first, should also be the severest sufferer, can hardly excite surprise, when it is considered that here the *vis a tergo* from the heart, which is now clearly proved to influence the passage of the blood through the capillaries, even if it continue still unimpaired, only serves to increase the accumulation of blood in its larger vessels, which, in its transmission through the former, and its more minute venous branches distributed upon the vascular gastro-intestinal mucus surface, has been deprived of its fluidity, and is thus rendered incapable of easy transmission even through those of much larger caliber, at which, in its deteriorated condition, it ultimately arrives. Besides

* See *Orton on Cholera*, page 8, in which cases are mentioned as having occurred in the East Indies, of natives being seized with it while walking in the open air, and having fallen down and almost instantly expired.

that, to the natural disadvantage, owing to the isolated position of the portal, as compared with the general circulation, from having to overcome the resistance of a second capillary system, by which the impetus derived from the heart must be sensibly impaired; and its being similarly situated with regard to those aids which the systemic venous circulation is supposed to receive from the organs of respiration and right chambers of the heart, is to be added the existence of a new source of detention in the attraction which the separation and passage of the serosity into the intestinal cavity, must be supposed to exert upon the blood in proximity, even in the larger vessels, so that the supervention of this action in their minuter connections probably increases the evil that occurs primarily in the former; and the remote cause of all this morbific mischief, doubtless itself possesses a specific power in arresting the motion as well as of destroying the integrity of the vital fluid, as proved by the instances of almost instantaneous death referred to. What individual share each of the foregoing has in the congestion occurring in the more prolonged cases, is not easy to determine, but that it is owing to a combination of all of them is not improbable.

That the burning sensation in the præcordial regions is the effect of the congestion, is generally supposed; but whether the physical causes which we have assigned for the production of the latter may not collaterally, some of them, be the source of the former, deserves consideration. And although, in the present state of our knowledge, it would be too much to allege, the unwonted separation and passage of

the serum, so often alluded to, appears certainly more consonant than any thing else with this remarkable sensation, and to bear to it a very constant relation, being one of the most uniform as well as peculiar features of the disease, occurring as it does, when the temperature of the body is found to be actually below the natural standard. That an anomalous perception should accompany a new physical action set up in the system, seems reasonable to expect; and, for the reasons stated, we have been induced to offer the explanation of this in question, although of a purely conjectural nature.

But, as has been said, the general circulation soon becomes involved in the disasters commencing in that which is accessory, so that at length, as has frequently been observed, the appearance of the blood in both sides of the heart is often found exactly to correspond, and the lungs, as is commonly the case, too, are ascertained to be engorged with the same dark unoxydized blood. The results of post mortem examinations of the latter organs, however, have occasionally presented some remarkable discrepancies; instead of this abnormal congestion, they have occasionally been found in the very opposite condition, and exhibiting such extreme collapse, as to have induced one observer to resort to the experiment of piercing the thorax while immersed in water, under the impression that it resulted from the presence of gas between the pleural surfaces capable of overcoming the atmospheric pressure, but without the effect, namely, the extrication of it occuring that was anticipated; upon which Dr.

Johnson thus comments:—"As there appears to have been an absolute vacancy in the cavity of the pleura, that is to say the lungs did not by any means fill it, it would seem that that viscus had exerted a contractile power adequate to overcome the pressure of the atmosphere." But granting this unusual circumstance to have occurred in those cases, we cannot so readily acquiesce with the views of this distinguished author, and will at least offer something in further explanation of the matter; for, although believing that the lungs possess considerable contractile power, it is difficult to conceive how so remarkable an effect could have been produced by this agent solely, so long as the organs preserved their usual contents. We would, therefore, add, that possibly the same status of the circulation, which, as has been said, causes arrest of secretion in other organs, may, in certain cases, by its more or less sudden occurrence during the last moments of life, in the larger vessels connected with the right auricle of the heart, have at length deprived the pulmonary* artery of its accustomed supplies, or else that this tube itself had become obstructed, while the motion of the blood remaining in the bronchial capillaries being sustained a little longer, owing to the tendency to a vacuum from the action of its left cavities, that in this way is caused a very anæmic condition of the organs in question. Admitting, then, the correctness of the assertions of Reisessen, Laennec, and others, with regard to the existence of muscular fibres in

* The pulmonary artery has been found plugged with a fibrinous clot.

the minute tubes, which, taken in connection with the recent satisfactory demonstration of the contractility of the lungs upon the direct application of a stimulus, and the well-known phenomena of spasmodic asthma; it can hardly be considered improbable, that in certain cases of Cholera, a disease so essentially characterized by spasm, these organs themselves become seized with it, and that this occurring just previous to dissolution, under the circumstances detailed, when, in consequence of the great diminution in the contents of their vascular parenchyma, they are placed in the most favourable position to undergo the change, the natural apposition between the pleural surfaces becomes thus permanently destroyed by the subsequent intervention of death.

Their condition, in cases of death from hæmorrhage, the general effects of which, as has been said, offer a striking resemblance, throws no light from analogy upon the matter, for, in these, the organs are found to be filled with serum.* Suddenness in the change of volume would appear to be an essential condition in the cases referred to, as we find that when it occurs under a slower process, from the effect of pressure as from a pleural effusion, the subsequent absorption of the compressing medium is uniformly attended, when re-expansion does not take place, with an access of the surrounding viscera, or dislocation of them, as it has been termed, to fill up the space they occupied. Altogether the idea of a vacuum within the body, well proved, as it appears, and supported on such high authority, in its explanation,

* See *Dr. Marshall Hall on Loss of Blood.*

presents, it must be confessed, much difficulty. We have given that which appears to us most feasible.

Great attention has been paid, both in Europe and in India, to the examination and analysis of the blood in Cholera, and the result of these investigations have been very uniform. All agree in noticing the extraordinary disproportion between the serum and crassamentum, the increase of the carbonaceous matter, the decrease of albumen and fibrin, particularly of the latter, and the salts of the serum; while correspondingly the components of the dejections are found to be water, mucus, fibrin with albumen, and the various salts of the blood; the flaky matter contained in them being principally fibrin. Comparing the results of these with the analysis of healthy blood, there appears a closer connection than usually occurs, at least in the living organism, between cause and effect, since we find the very materials which are defective in that of Cholera, present in an excrementitious form consequent upon the disorder, and whether thrown out by the intestines in the mode of a secretion, as some maintain, or by a new physical action, the inference that the vital fluid has undergone great deterioration from the consequent destruction of its integrity, can hardly be denied. How far this alone may be productive of mischief in the system generally, owing to the primary alteration in the vital stimulus, we do not pretend to say; but that its secondary effects, resulting from a mechanical obstruction of the circulation from the thickened state of the blood, is the source of certain grave disturbances of important functions, some of which

have been enumerated, is our firm conviction; and further, that it will be seen, that this very serious lesion is sufficient to account for other matters which are themselves secondaries or sequences, to what in turn become excitants in the morbid train which is to follow. Thus there seems no necessity for having recourse to the supposition of a morbid and specific poison existing in the blood, which nature endeavours to rid herself of through the medium of the gastro-intestinal mucus membrane, and, therefore, that the evacuations in Cholera are salutary, the process, in fact, by means of which the sufferer is to be restored to health, by the effusion of that portion of the blood which passes with most facility through membranous parietes, or, as another author holds, by a secretion at the nearest point to the centre of circulation, that can be effected. So that, in accordance with these views, it would appear either that the poisonous material resided solely in the serum, and, as we may infer, was equally diffused throughout it, and that the latter was poured out in an unchanged form, the effort of nature being to get rid of, as much as possible, of the offending matter; or else, that although the whole of the blood was implicated, her unassisted efforts were unavailing in effecting the requisite depletion, except of the portion capable of the new transit; namely, the serosity. Or viewing it in the light of a secretion, that a new action had become established for the purpose of separating, through the agency of the gastro-intestinal mucus membrane, a poison pre-existing in the blood, but which required to effect it, great dilution with a fluid, which was

found to contain so nearly the normal components of the serum, as to be almost physically identical with it. Such are the explanations which appear the most rational of some of the prevalent views, of a poison in the blood being the cause of Cholera; and according to which the evacuations, so far from holding a primary position, are to be regarded as the means adopted for dispelling the disorder—a supposition that must be regarded as utterly untenable, if it be considered that if ever "cure proved worse than the disease," it surely would be found in this, by which the blood is rendered unfit to circulate in its channels, and all the powers of life are observed to flag, in a great measure at least, palpably in consequence of the physical interruption of so important a function, which, nevertheless, according to these conceptions, is to be regarded as an ordeal, by means of which the sufferer, provided his vitality proves competent for the struggle, is to be restored to the condition of health.

We maintain, then, that the blood, after having been deprived of its fluid as a primary source of the mischief to follow, and reversing the order given as that upon which is founded most of the theories to explain the phenomena of the disease, becomes, as it were, its own poisoner; and how this is effected is not difficult to explain, since the same viscidity which, as has been said, is, in the first instance, the result of destruction in its integrity, becomes, as we have also endeavoured to show, the cause of arrest of those secretions which are destined solely, or in part, for the elimination of certain deleterious matters which

must otherwise accumulate in the system. Without unnecessary detail, we may mention those of the bile and the urine; to the former of which especially, in addition to the imperfect transmission of blood through the lungs, is to be attributed the disproportionate presence of carbonaceous matter always found in it, both in the arteries and in the veins, a change that is to be regarded in no other light than that of poisonous, not to mention the other consequent *effete* accumulations which might be adduced, but which, being sufficiently obvious, do not seem to require separate enumeration.

Thus from what may be termed a mechanical lesion in the first instance,* there arises another which may be termed chemical. By the first it is disorganized as regards its normal proportions, and by the second it loses, gains, or combines materials, which are either foreign to its healthy condition, or incompatible with this as regards both combinations and proportions. We may proceed next to explain some other phenomena, apparent or real, which, in their turn, have been taxed as the specific causes of what they are themselves to be regarded, as playing only the subordinate parts of incidental effects. A remarkable one is that which attributes the disease to paralysis of the heart, the dejections being a salutary drain by secretion to relieve its distress; but there appears no reason to

* It may be objected that the lesion spoken of, the separation of the serum and crassamentum, is not strictly a mechanical one, part of the albumen of the former being retained within the vessels; but we conceive it to be sufficiently so to warrant the expression, the watery dejections and the serum, appearing to be otherwise quite analogous.

have recourse to this explanation, since we imagine what has been already stated amply sufficient to account for any symptoms that might simulate such an affection of the organ, impeded as its motions must be, and deprived of its accustomed stimulus, arterialized blood. And that the latter want, especially in reference to the nervous centres, is the cause of other symptoms more particularly in connection with the failure of the circulation and of the state of collapse, is also highly probable, for the conclusion of Majendie, that the brain does not require the presence of arterial blood for the performance of its functions, in consequence of the unaffected state of the mind in this disease, although it may be correct, regarding it as the medium of mental operations, is certainly not universally so as regards its relations to the vital functions in connection with the other nervous centres.

In estimating the effects of the malady generally then, we are not to lose sight of the several resulting and concomitant circumstances which, as we have endeavoured to show, although deducible from the same grave lesion of the circulating fluid, and, in reality, secondaries, yet so speedily assume such formidable positions, and present so nearly the appearances of specific and independent origins, as with difficulty to be connected with their original source. Thus the extreme prostration, constituting the state of collapse, is to be traced to the want of the requisite stimulus to the heart and nervous centres, arising, on the one hand, from diminished nervous energy, and, on the other, from failure of the heart's action; and it will be readily admitted that both these defects must

mutually react upon each other, thus jointly increasing the compound evil, and more certainly ensuring its continuance. There is here, then, we conceive, without further entering into the subject, a key to the solution of other matters evidently depending upon their due discharge, and also a *rationale* of the production of many of the phenomena of Cholera; and why effect has been so frequently mistaken for cause in the conclusions of some most accurate observers of the disorder. There is still, however, an important doctrine with regard to it to be considered, which attributes the disease, in common with some others, perhaps equally questionable, to the vital alteration termed inflammation; from which, notwithstanding the high authority of Broussais and his numerous followers, both in this country and on the Continent, and of Corbyn and others in India, we express our entire dissent; but that it often speedily, and too commonly, ultimately supervenes in the progress of the disorder, as readily admitting, and that in this way, as in other cases, it comes to be taxed as the original cause in the course of diseased action with which it has become blended. That the alterations in the blood itself may be alone sufficient to produce it, is not improbable; but the single, well known fact, of the close alliance between congestion and inflammation, the merging of the one into the other so commonly, although not invariably observed in other diseases in which the first condition preexisted, is sufficient to show the liability of the occurrence of the latter in a disease so eminently characterised by congestion as this. Accordingly, we find some of the most dangerous sequelæ of Cholera of this nature,

.ch, in cases where death has occurred, pending the disease itself, provided the progress of it has not been too rapid for its supervention, traces of gastro-intestinal inflammation, as *a priori* might be expected, are common morbid appearances revealed by the scalpel. But the rapidity with which the disease arrives at a crisis, usually in a very few hours; its occasionally almost immediately fatal termination from the period of its first invasion, and also its sometimes abrupt termination and transition to health, after an interval which seemed to threaten speedy dissolution; the state of the pulse, of the surface, which, although to the patient feeling warm, is, in reality, cold and damp beyond what is natural; the calmness and indifference of the mind, and other circumstances which a state of feverish excitement, almost inseparable from inflammation, would be least likely to be associated with; and, lastly, the state of the blood when drawn during life, which has been scarcely ever known to exhibit indications of inflammation, are all opposed to the assumption.

But it may be asked how it happens that the remedies which experience has shown to be the most efficient in combating inflammatory action, have been found, especially in the hands of our Indian brethren, the most successful agents also in the treatment of Cholera, although the *ratio medendi*, in the latter instance, must be essentially different from what takes place in the former, if it is held that its production is independent of this fertile source of diseases, which, being thus primarily analogous, admit of being usefully grouped for practical purposes into the class requiring the antiphlogistic treatment. Two of these are so

noted for their efficacy in the latter, and have been so lauded, on most respectable authority, as the main dependences in Cholera, as to require separate consideration; we mean calomel and the lancet. As to the action of the former, although it has been probably more universally employed, and bears a higher repute than any other internal remedy that has been subjected to an equal trial, it must be regarded as still quite undetermined. Those who refer it to its ordinary antiphlogistic properties, will find many difficulties to contend with in maintaining their views; particularly the shortness of the period within which the beneficial effect of the remedy must of necessity be exerted in many instances, being at variance with our observations of it in other diseases; and the well known fact that the existence of ptyalism is no safeguard from the invasion of Cholera, and seems to exert as little influence upon its progress. To attribute it to its effect upon the secretions, particularly of the liver, is open equally to objections; the idea that the disease depends essentially upon arrest or depravation of the bile, being already quite obsolete, and its action upon any of them being altogether insufficient to furnish grounds for so important an argument; and thus dissatisfied with both these explanations, choose to refer it to what has been termed its sedative effect, from its supposed utility when given in large doses in allaying the vomiting and purging. But while this has, perhaps, been sufficiently demonstrated in some instances, it is to be recollected that these acts do not constitute the disorder, resulting merely as they do from the contact of offending matter within the digestive

cavity.* Others, again, but they are the smaller proportion, deny its efficacy altogether, and never administer what has been termed a sheet anchor by its advocates in this and so many other diseases. How this great discrepancy of opinion amongst the upholders of the mineral is to be explained, and what is the true *modus operandi* by which its beneficial effects are elicited, since the occurrence of the latter is supported by such respectable authorities, and seems established on the most extensive trials, are no easy matters to resolve. As for blood-letting, than which nothing has been more praised and practised by one party, or deprecated and neglected by others, perhaps its beneficial effects, where it can be borne on other grounds than a combatter of existing inflammation, admits more easily of explanation; since, in a disease known to be essentially characterized by congestion, the abstraction of blood from the system would appear a tolerably clear indication, and a measure that would serve to check the gastro-intestinal serous effusion, by promoting a withdrawal of the accumulation of blood from the larger internal veins, a morbid process which is likely to be assisted by the pressure of the columns of sluggish fluid reacting upon their minuter tributaries. Besides, it is not improbable that the loss of blood from a vein may artificially serve to restore its proportions, taken as a whole, by giving exit to the grosser portions, a matter that had been hitherto exclusively confined to the more

* Vomiting, it may be mentioned, however, being also an attendant upon excessive hæmorrhage, that which occurs in Cholera may partly be attributable to depletion.

watery; while the state of general collapse of the vessels, which might be hoped to result, instead of their local and irregular distension, would be calculated to give a check to the latter. Certain it is, however, that seldom in the epidemic, as it appeared in this country at least, was the operation warranted by the condition of the patient, and that whenever attempted, it should be with a cautious hand.

While upon the subject of remedies, we may add that it is by no means part of our purpose to enter into a separate investigation of the merits of the countless others which have been employed on various principles, and, with a view to meet almost as varied indications; most of them having been tried either upon so local or so small a scale, or have enjoyed such ephemeral reputations, when subjected to more extended examinations, as not to require any particular notice. There is, however, a remarkable one, that of the saline class, as originally introduced by Doctor Stevens and modified by Doctor O'Shaughnessy, upon which we mean to offer a few remarks hereafter, which, considering its bold and daring nature, coupled with the numerous well-attested cases in which it has proved beneficial under the most unpromising circumstances, appears worthy of more extensive trials, and an accurate observation of its action. That this may consist in something more than the restoration of the salts to the blood alone, with which intention it was originally administered, has often occurred to us; and although having little faith in reputed specifics in general, yet in a disease characterised by such awful rapidity, whose invasion is like that of

the midnight thief, whose advance is by giant strides, and whose natural termination would seem to be in the dissolution of the delicate fabric it has made its victim; perhaps a deviation from one of the soundest aphorisms in practice, that the doctrine of specificism appertains more to the charlatan of modern, or to the more excusable dreamy applications of science by our forefathers of bygone days, than to the enlightened physician of our own, is in this particular instance defensible, in which the train of symptoms are equally new, sudden and alarming, in which analogy from other diseases lends us little aid, and in which general principles almost entirely fail us. They are not the phenomena of fever which we have to combat, nor are they such as are referable exclusively to lesion of the nervous energy, nor yet are they explicable by reference to previous organic changes; but standing apparently inscrutable and alone, they are the phenomena of a new mode of disorganization.

More particular attention has been paid to the antiphlogistic treatment, at present so widely prevalent, with a view to meet the objections of those who contend for an inflammatory origin; and the opinions of Dr. Budd, in the article "Cholera," *Library of Practical Medicine,* speaking of the theory of Broussais, are so much to the purpose, and so entirely coincide with our own, that we cannot forbear transcribing them. He says:—"The supposition advanced by an ingenious author, that Malignant Cholera consists in inflammation of the mucus coat of the stomach and intestines, is opposed by the fact that

inflammations of these viscera occur in their greatest severity without giving rise to the same symptoms, and that the appearances after death do not accord with the ordinary effects of inflammation.* Besides, if this disease be simply inflammation of the coats of the intestinal canal, why have we not witnessed it until the last few years? The history of medicine offers examples of the occurrence of new specific diseases, but there is no evidence that there have been any modern additions to the list of simple inflammatory affections. The recent origin of Malignant Cholera, then, as well as its epidemic nature, concur with the reasons above assigned, and prevent us from considering it a simple inflammation—a supposition, indeed, utterly untenable, while the peculiar character of the evacuations, the unusual development of the intestinal follicles, the rapidity with which the disease proves fatal, its wide diffusion, and the permanence of its essential characters in circumstances the most various, show that it every where depends on one and the same special cause—a cause whose first effects are manifested in derangement of the functions of the intestinal canal, but which exerts on the economy the action of a powerful poison."

There is still to be considered the difficult question of the exciting cause and propagation of Epidemic Cholera, concerning which, also, we mean rapidly to glance at the opinions of others, previous to offering our own upon the subject—a difficulty which will be found only enhanced by the embarrassment of a

* That this admits of exceptions, when the disease has been of some continuance, we have already stated.

vast number of discrepant theories. Some of them are advanced by authorities whom one would almost hesitate to reject, upon the score of respect to the established ability of their propounders, while others carry with them such intrinsic evidences of ingenuity, as would lead us to embrace them as unexceptionable, did we not find, upon examination, that it is not one but several, and some, too, based upon the most opposite assumptions to which this merit is undoubtedly due. All, too, when brought to the test of a comparison with the few established facts that we do possess on the subject, more or less fall short of that practical corroboration which theory must borrow from practice in the elevation of the former to the rank of any scientific, and more particularly, if possible, of a medical axiom.

Foremost in the ranks, because the most important, in a social and political point of view, are the contagionists, who contend that the disease once produced, from whatever cause, is capable of propagation from contact with the infected or their fomites. Happily for the fears and convenience, too, of the public on this head, although the idea is not yet quite exploded, and, we believe, the disease is still within the pale of quarantine regulations; as it is the most untenable, so it already holds one of the lowest places of all in the estimation of those who have impartially devoted even ordinary attention to this interesting subject. The almost universal testimony of army medical men in India, where the opportunities for observation on a large scale are constantly being afforded, in the junction of corps suffering with the disease with others

which are healthy, or the reverse of this, in the negative; the no greater liability of persons engaged in constant attendance upon the affected, and, above all, the inefficiency of any of the quarantine regulations hitherto devised, in addition to many other circumstances that might be adduced, appear amply sufficient to set the matter at once and for ever at rest. To attribute it to the influence of terrestrial malaria, is evidently of too local a character to bear examination, inasmuch as no description of surface has proved exempt from its visitation, whether dry or moist, or however characterized by its geological relations, unless we could suppose the malaria to be conveyed by the atmospheric currents to places very remote from the sources whence it emanated, and that it was capable of overcoming every obstacle opposed to it; such as the intervention of the loftiest mountain ranges, remaining equally unabsorbed and unaffected after traversing the heating sands of a desert or the cooling waters of an ocean. These are all matters hardly reasonably admissible; but there is another consideration that would seem fatal to the supposition, the established fact of its being repeatedly observed to advance in directions contrary to the prevailing winds, as in India, for instance, against the steadily and strongly blowing monsoons. The same observations, we conceive, are applicable to Dr. Holland's ingenious theory in reference to Cholera, as suggested in his *Hypothesis of Insect Life as a Cause of Disease.* And that the extremes of heat and cold, although the former would appear more congenial to its development, and more

particularly connected with its eastern origin, are not to be taxed as the efficient causes either of this or its subsequent progress through regions the most diverse and discordant with each other, as well as regards temperature as every other aspect of physical climate, are evident enough. For although experience has shown that the summer season is the most favourable for both, it remains to be seen whether the increased activity of a different agent besides heat, at this period, may not be concerned in causing it.

There is still, however, another important agent universally connected in its operations with the globe which we inhabit, and which, beyond doubt, exercises a more extensive influence upon our physical well-being than is at all recognized as yet, although in other departments of science, having long since received attention more commensurate with its merits, and having already advanced to a position which, on account of its practical importance, it demands—we mean electricity. To this, also, the origin of Epidemic Cholera has been by some vaguely ascribed; and although no explanation or *rationale* of its action has been as yet offered, that we know of, still it is an opinion every day gaining ground, and it will assuredly be found more consonant with the eccentricities in the course and development of the disease, and its singular exemption from interruption from ordinary obstacles, than any other that can be urged. The subject of atmospheric electricity, nevertheless, has not been altogether neglected, and some valuable facts in reference to it have long since been ascertained. Thus the experiments of Mr. Read and

M. Saussure go to prove that it is subject to a periodic flux during the twenty-four hours:—"The times of its greatest force being some hours after the rising and setting of the sun, those when it is weakest preceding these periods." Now it is worthy of notice that the attack of Cholera, as is well known, most ordinarily occurs during the night, particularly a little preceding daylight; and the question would seem a natural one, whether this can be connected in any way with the phenomena alluded to, since either any irregularity or accession of force in this powerful agent, which would appear ordinarily to be controlled within periodic changes, is most probably attended by corresponding results.

There is such a mass of evidence to prove unusual disturbances of the elements previous to great outbreaks of the disorder, that the conclusion that a connection existed between them seems irresistible; and that the latter, more or less, depend for their development upon electricity, is also in accordance with what we know upon the subject. Fearful thunder storms have been particularly frequent;* and if proof be required that it is dependent upon some great and universal cause, such as this in question could furnish, it will be found in the fact that the disease, when it has appeared in its most marked and aggravated form, has not been confined to the human species merely, but has extended to those of the lower animals possessing similar internal comformations, of which, also, very ample evidence could be adduced. Mr. Jameson, in his faithful account of

* See upon this subject, *Corbyn on the Epidemic Cholera.*

the invasion of 1816 in India, speaking of it, says:—"Throughout Upper Hindostan, it was observed that horned cattle were very sickly at this period, their bodies could be seen by passing travellers, strewed in vast numbers in the pastures." By other authorities, purging and vomiting are mentioned as common amongst the lower animals, whilst the latter, even amongst horses, an act very rare with these animals, the matter ejected being a *serous fluid*, attended with profuse sweating, and followed by death, has been known to occur.*

From a consideration of all these circumstances, that the tendency exhibited by certain similarly organized beings, although widely differing in some respects, to be at the same time affected with the peculiar symptoms, which have been in the aggregate termed Cholera, is dependent upon some universal but progressive commotion or irregularity in the electric currents pervading our earth and its atmosphere, owing to causes which, although at present involved in mystery, the advance of science may hereafter reveal, appears to us the most reasonable hypothesis in the difficulty, and the most consonant with general observation.

Electro-magnetism, a department of science as yet almost in its infancy, will, probably, when better known, be found to throw some light upon these obscure matters. The question has frequently occurred to us, can the chiefly westerly variation of the magnetic needle in this hemisphere bear any relation to the uniform track of the Epidemic in a similar

* *Johnson and Martin on Trop. Climates.* Page 354, Sixth Edition.

direction? Such a connection may seem remote; but it is by no means impossible. It is from comparative observations of the diversified phenomena of the physical world that we can only hope for an elucidation, nor should we be induced to hesitate from our own apparent independence of their existence. At all events, it is most desirable that, during the prevalence of the Epidemic, in future, to the ordinary atmospheric observations, there be added others connected with its relative electric conditions; a sufficiently portable and, at the same time, accurate instrument for the purpose, being still a desideratum.*

That widely different diseases may be the result of modifications of the same primary excitant, by which its force is weakened, or its direction within the organism altered, is highly probable. As, for example, the influenza, so analogous to Cholera in its course, and in some other respects, which there is every reason to suppose is also of electrical origin.

* Since the above was written, the following, which would seem to bear out our views, has appeared in a late number of the *Manchester Guardian*:—"CAUSES OF CHOLERA.—In reference to this we have been favoured with the following extract of a letter from St. Petersburgh, written by a gentleman well known in Manchester, to the firm here, in which he is a partner:—'A very important discovery has been made here very recently, which clearly proves that the malady is in the air, and that, therefore, quarantines are utterly useless; the air here has had a very singular effect on the magnetic power, whilst the Cholera was at its height, the action of the magnet was nearly neutralised, which, now the disease is gradually subsiding, assumes by degrees its former power. A magnet block, which used to carry 80lbs. would, during the worst time of the Cholera, not carry above 13lbs. Its strength has now increased again to 60lbs. The Electro-Magnetic Telegraph at one time would not work at all.'"

A principal feature in Mr. Thom's excellent report, is his supposition that the Choleric Diathesis, "in the absence of exciting causes, may be dormant in the system for months or even years;" and the latter he seems to identify with an elevated temperature combined with a very moist state of the atmosphere. Yet his own statements are, we think, sufficient to induce inquiry into some other causes than those alleged. He says in one place, "The thermometer is at this moment, October 14th, as high as it was during the Cholera, being 90 to 92 in houses, and 100 in tents, in the middle of the day, yet we feel fresh, elastic, and free from that *horrible undefinable sense of oppression* that prevailed in June; evidently it is not simple temperature, and *lichen tropicus* has disappeared." This he attributes to an alteration in the dew-point, and again he mentions, as a very common occurrence among people in general, while the disease prevailed, *an unpleasant tingling sensation* in the palms of the hands and in the soles of the feet, often pervading the whole extremities, and producing *twitchings and spasmodic startings* of the limbs when in bed. Now the similarity between these last, and the effect of electricity artificially excited and communicated to an individual, is obvious enough, while, as regards the first mentioned, unpleasant effects from certain electrical states of the atmosphere, upon persons of highly nervous organizations, are circumstances every day to be met with, and we can easily conceive how a concentration of the same could produce the feelings in question generally.

We can no more assent to this author's conviction of

the long incubation of the disease in the system referred to, in the sense in which he appears to regard it, as similar to the mode in which some others are known to remain dormant, until called forth by circumstances favourable to their development, than we can to the doctrine of contagion. Our view of the matter being, that during the operation of a widely diffused agency, to which great numbers are equally obnoxious, a certain proportion, owing to a constitutional adaptation to its influence, whether original or acquired, will only be affected by it, and that this proportion will be determined as well by the degree of susceptibility possessed by those exposed to it, as by that of the concentration or energy of the exciting cause, which shall have exerted no deleterious influence whatever upon the remainder, but that the adaptation referred to is itself controlled or regulated by several modifying circumstances. Thus, for example, age, occupation, and, as Mr. Thom's experience shows, even stature, and, above all, previous habits of life, whether temperate or dissipated, and the position in the social scale occupied by the individual, exercise very important influences upon its diffusion.

There is a circumstance, however, that seems to deserve notice, as bearing on the subject both of contagion and incubation. It has been observed that the first appearance of Cholera in a country has sometimes occurred amongst individuals who had recently arrived from places where it had been prevalent previous to their leaving them, as, for instance, amongst sailors who have lately come into port, so as to give rise to the suspicion that the disease had been imported, and

was, consequently, contagious. Yet we are far from thinking this single fact, opposed as it is to so many others, sufficient to establish so important a conclusion, for we can easily imagine that in the case of persons who had been recently exposed to a general exciting cause, a suspension of effect might occur for some time after their removal from its immediate influence. This may be owing, probably, to the retention of the morbid electrical condition at first impressed from without upon the organism, for some time subsequently to a change of position, placing the recipient, as has been said, beyond the external agency where it had been acquired, while some other circumstances, such as irregularities of living, &c., may be looked for, to account for its being called into play, so as to produce the disease.

It is not to be understood, from what has been said, therefore, with regard to the anomalies of the disorder, which render it incapable of being subjected to some of the laws which are known to regulate the propagation of disease, and that would seem to place it beyond the pale of ordinary prophylactics, that it is meant to be held as affording less scope for the exercise of the means of general sanitary improvement and amelioration of the social condition as an indirect, but efficient means, of arresting its ravages amongst communities exposed to its invasion. This is a sentiment that would fall little short of the fatal absurdities which, for a different reason, are taught, with regard to the plague, by the disciples of Mahomet. On the contrary, we have the most unequivocal evidences that the poorly clad and nourished, the depressed in mind and body, are almost invariably

amongst the earliest victims; whilst those whom fortune has placed in superior stations, and are less exposed to such vicissitudes, proportionately enjoy exemption. It seems probable, however, that the power of resistence in some measure diminishes correspondingly with the length of period which it has been called into action, and that in this way is to be accounted for its subsequently, as has sometimes been remarked, attacking individuals amongst the affluent that had hitherto escaped with impunity, after devastating those of lower circumstances.

But we have still to examine by what morbid process, after a separation of its components, a portion of the blood gains exit from the system, independently, as has been said, of the vital act of secretion? Amongst the many modern additions to our knowledge, few, perhaps, are more valuable, and none more curious, than those which the researches of Dutrochet, and of some others subsequently, relating to the transmission of fluids through intervening parietes, have afforded; serving to explain, as they have done, phenomena previously inexplicable, and throwing a new light upon some most interesting departments of physiology. The influence which the facts in question may have in connection with or producing the morbid changes that constitute or accompany diseased action, being, however, little investigated, yet we are disposed to believe that by a physical process, something analogous to those described by the above author, probably called into action by electricity, the morbid effect under investigation is produced, the separation of the serum being also attributable to this agent.

Nothing that we are acquainted with affords so reasonable an explanation of what the result of observation indicates, namely, that the most constant attendant upon the disorder, and usually the earliest, is the discharge of a quantity of fluid from the intestines, and when not discharged, that they are found (unless in certain rare cases, where death has occurred almost immediately after seizure from congestion), distended with the same, showing its essential relation to the disease, and that this fluid is, as has been chemically proved, the serum of the blood, so little altered as to warrant its being regarded as a mechanical separation, and effected by a process entirely distinct from the vital one of secretion; while to prove its special production might be adduced various particulars, such as the sudden occurrence of the effusion, its being independent of inflammation, and originating under a condition of the system the very reverse of this, namely, of depression.

If it be asked how, in accordance with what is already known on the subject referred to, this takes place, or, in other words, what is the exact explanation of the process; perhaps it may be said, that probably nothing exactly analogous has yet been elicited by experiment, but that even in the present state of our knowledge, the modifying circumstances are found to be so various (that is, the transit of the fluids experimented upon is influenced by so many causes, that possibly this will one day be found capable of demonstration), that the absorption of the fluids of the intestines into the blood is effected upon this principle, seems now a settled question.

We know that it may be objected, that along with change, of volume, there is implied in the terms endosmosis and exosmosis, a mixture of the fluids, a supposition not warranted by the phenomena of Cholera; since it would seem that the source of mischief, is the simple drain of the serous part of the blood from the vessels outwards, independent of a reciprocal action inwards, from the intestines. But without insisting on the allocation of the process, by which this is effected under the foregoing denominations, we have been induced to bring them forward, from their acknowledged operation in the human body, as causes of the motion of the fluids—convinced that that by which the escape of the serosity is effected, is closely allied to the extensive group of causes producing the changes of volume, to which the terms in question have been applied. Besides, from the explanation given by Liebig, of the absorption of the fluids of the intestines, it would appear that this mixture or interchange does not necessarily occur; he says:—"The blood vessels contain a liquid for which their walls are in the normal state far less permeable, than for all the other fluids of the body;" and a reference to the context will show that an interchange is not spoken of.* Now it appears to us not too much to suppose, that in certain abnormal states of them, from an alteration in their pores allowing this fluid, or at least the serous part of it, to pass with facility, added to changes in the fluid itself, dependent, as we have surmised, upon electrical irregularities, a reversion of the act of absorption may

* *On the Motion of the Juices in the Animal Body.* p. 59.

be the effect. And, perhaps this is all that is necessary to be conceived, so far as the loss of the serum is concerned.

Whether the alteration in the pores of the living vessels consist in a mere enlargement of them, mechanically admitting the passage of the serum; or, as appears to us more probable, in some changes in the affinities between them and the fluid in contact with them, of electrical origin, by which the direction of the latter is altered, we do not pretend to speak positively. The experiment of M. Porret, which we are about to mention, proves that the galvanic action is capable of causing the passage of water through a membrane, and it is plain that by reversing the connection of the poles in the performance of it, a reversion of its current or direction would be the result; this would appear corroboratory of the latter hypothesis.

It would by no means answer the scope of our present limits, to enter into any minute details of the many curious properties of what has been termed the endosmosic current, nor would it at all subserve to the purpose; suffice it to say, the conditions which regulate it are sufficiently complicated. Thus, for example, it is not in every instance towards the denser fluid that it is turned. The nature of the membrane employed may affect it; acids and alkalies serve to destroy it, by combining with the membrane; and it must not be forgotten, that in M. Porret's experiment already referred to, in which simple water was employed separated by a membrane, exactly similar results were obtained by the action of the voltaic pile—the positive pole being put

in connection with one compartment containing it, and the negative with the other.* The subject, however, still demands much investigation, and we have merely noticed the above to remind of its complex nature; and, at the risk of being regarded as taking too mechanical a view of phenomena connected with diseases which are referred exclusively by some to what have been termed vital alterations; we do assert our opinion, that many of those whose exciting causes appear locked in obscurity, and amongst those such as belong to Cholera, depend on the operation of purely physical agencies, acting directly upon the organism, and that of these, one of the most important is electricity.†

* *Annales de Chimie*, tom xi., p. 137.

† There is one circumstance relative to the greater or less liability of persons of various occupations to Cholera, that we will go the length of citing, in connection with the views which we have advanced, and for reasons that will be stated:—It has been long remarked in the city of Calcutta, that the large portion of the native population termed beesties, or water-carriers, whose mode of performing their tasks is by means of large leathern bottles carried across the loins in close proximity with their naked bodies; enjoy a singular exemption from the disorder, so much so, indeed, as to have attracted general attention, and we believe a death from Cholera amongst this laborious and low caste body is a very rare occurrence. Can it be, as we have sometimes thought, that the body of fluid so constantly in apposition with their persons, and only separated by a porous envelope, exercises in some way an attractive force, by which the fluids within the body are prevented from yielding to the morbid impulse, that would otherwise (in a certain number of instances) be communicated by the general agency to which all are exposed? That we should look for some more concealed reason why these people should possess this remarkable immunity would appear obvious, as there is nothing in their habits of life essentially different from the other classes of natives who

If the separation and passage of the serum be effected by this agency, and the latter by a physical mode, which, as may be expected from analogy, is perhaps liable to modifications, it may not appear improbable that, under other circumstances, the coloured portions of the blood should in this way pass into the intestines, the serum being the part retained. At least, we have frequently suspected that the black matter ejected by the stomach and bowels in bad cases of yellow fever may be from this source (it has been attributed by some authorities to extravasated blood), and the general history of this fever would seem in some other respects to bear us out. Take for example the definition of yellow fever, given by Dr. Bartlett, of the Transylvania University, United States:—"In nearly all cases, *unusual thinness and fluidity of the blood*, and redness, mamellation, changes in the thickness and softening, one or more, of the mucus membranes of the stomach, this organ and the intestines usually containing a considerable quantity of *a very dark or black fluid or semifluid matter*, which disease differs essentially from all others in its causes, its symptoms, and its lesions, and is only to a moderate extent, at least in its graver forms, under the control of art."

To revert briefly to the subject of treatment: if the views we have taken be correct, and the true *causa mali* be the rapid loss of the serous part of the blood, by a physical process called into action by electricity, we have

usually suffer in a fearful degree during the prevalence of the epidemic. As any addition to our record of facts upon the subject, appeared to us worthy of it, we have noted this, but without insisting upon the explanation suggested.

at once a clue to what our efforts should be directed, namely, primarily the arrest if not the reversion of this morbid process; but how this is to be best attempted, must remain for future experience to determine. It has, however, occurred to us, that perhaps in this way, more than from the restoration of the salts to the blood, *per se* the saline method may have proved efficacious. These substances are known to possess, when in solution, a tendency, under certain circumstances, to permeate membranous structures, but then, according to observation in the living body, this will occur only when the per centage contained in the solution is less than that contained in the blood—and in this manner has been explained the determination of the action of certain medicines of this nature, either as purgatives or diuretics—according to the relative quantities in which they happen to be administered. But it may be supposed that in the case of Cholera, where the blood has already lost the greater portion of its salts, that a larger amount than ordinarily would in this way gain access, and hence that the administration of salines may have proved efficacious, not only by restoring some of its normal components to the blood, but by promoting a reversion or suspension of the morbid action by which they were originally lost.

As plain water enters the circulation with still greater facility, it establishes a reason, we conceive, why its free use should not be interdicted, while, if warm, it may be rendered suitable for the stomach by some simple medication. The cravings of the patients for this element are usually remarkable, so that it would seem as if nature by this means aimed

at a dilution of the blood. But, at the same time, such measures should be attended to as would serve to restore and promote the natural perspiration, which, as is also ascertained, is essentially concerned in the absorption and distribution of the fluids, and is, at this time, more particularly requisite in consequence of the almost invariable suspension of the functions of the urinary organs, the special apparatus for regulating the state of concentration of the blood, and, consequently connected indirectly with the process of absorption in the intestines.*

As it would neither answer our prescribed limits, nor be conformable with our original plan, which did not contemplate the consideration of practical treatment, we shall not enter upon a detail of how this is to be best accomplished. Suffice it to say, that such external appliances, as common experience indicates as suitable, should not be omitted, these, we think, combined with warm drinks, will be found most eligible for the purpose.

Neither should be neglected the class of astringent remedies; we have seen from direct experiment upon the dead membrane, that certain substances in solution destroy its power of transmitting fluids, and a timely exhibition of them may be hoped to check the serous depletion by their action upon the pores of those within the living body. Their indication, however, would appear to be confined chiefly to the earlier stages of the disorder.

Of such agents as are known to possess efficacy of this sort, perhaps opium is the most eligible,

* *Motion of the Juices*, &c., page 59.

as, in addition to its astringent qualities, its great power in allaying spasm should not be lost sight of, nor the analogical inferences that may be deduced from its value in excessive hæmorrhages.

One circumstance stated, that we look upon as of great moment, in a disease characterized by such extreme asthenia, especially when the stage of collapse impends, or has set in; and we have said all that is necessary as regards a general view of the treatment, which, as we conceive, it demands. The importance to be attached to the preservation of the horizontal position, and the gentle manipulation of the patient, especially if circumstances render removal desirable, as amongst the humbler classes from their own homes, to the superior accommodations of an hospital.

Before concluding, we here present a summary of such leading propositions, as in the foregoing we have been endeavouring to establish:—

I. That the proximate cause of the phenomena of Cholera is the separation and loss of the serous part of the blood.

II. That many of these are such as bear a near resemblance to the symptoms of excessive hæmorrhage, thereby showing a close analogy in their production.

III. That some which have been regarded as special are in reality secondary to the foregoing lesion, owing to the consequent obstruction of the circulation.

IV. That the separation and depletion are effected, independent of secretion, by a physical process, the depletion being through the medium of the gastro-intestinal mucus surface.

V. That it is probable that the external moisture

thrown out upon the skin is of similar origin and constitution with the fluid in the intestines.

VI. That the more remote cause of the disease consists in certain disturbances in the electricity pervading the earth and its atmosphere.

VII. That the first effect of these upon the organism consists in congestion, and that this commences, and is most marked, in the portal system. The second being the calling into action of the morbid process alluded to.

VIII. That the disease has no connection with inflammation beyond its occasional occurrence as a secondary effect.

IX. That almost every circumstance connected with it precludes the idea of contagion.

We have now brought to a close this brief exposition of our views. By some they may be censured as weak in argument, or deficient in proof; but when the present inadequate data, from the absence of sufficient statistical and special information in reference to applications in a great part new, notwithstanding the large amount of a general nature already in existence, are considered; these defects may, in some measure, claim indulgence; and if the opinions we have advanced, in what we trust will be regarded a calm and dispassionate spirit, may have thrown a light, however imperfect, on the obscurity in which the subject of our consideration has hitherto been involved, or be the means of directing inquiry in a new path, we hope it will be thought that our efforts have been well exerted, and that this short treatise has not been penned in vain.

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CHOLERA:

AN

ANALYSIS

OF

ITS EPIDEMIC, ENDEMIC, AND CONTAGIOUS CHARACTER;

WITH ORIGINAL AND PECULIAR VIEWS OF

ITS MODE OF PROPAGATION AND THE MEANS OF COUNTERACTING IT.

SHOWING ALSO BY ANALOGY

THAT THE MEANS OF PRESERVING ORGANIZED BODIES FROM DECAY POINT TO THE ONLY TRUE CURATIVE PRINCIPLES IN THE

TREATMENT OF FEVERS GENERALLY,

AND MORE ESPECIALLY

CHOLERA.

BY HENRY STEPHENS,

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AUTHOR OF

"A TREATISE ON OBSTRUCTED AND INFLAMED HERNIA, AND ON MECHANICAL OBSTRUCTIONS OF THE BOWELS."

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PREFACE.

During the years 1832 and 1833, I saw and was much engaged in attending patients with Cholera. The many tragic scenes I then witnessed left impressions on my mind which have never been effaced. Two persons died in my house from it: one from the reactionary fever subsequent to a mild attack, she being an aged person, the other from the severest form of collapse, she having neglected the premonitory symptoms. A train of reflections crossed me during the prevalence of the disease, and some portions of the present Treatise were written at that time, but not published.

I have since that seceded from the practice of medicine, and have been engaged in other occupations. The lamentable prevalence of this disease at the present time has brought back my

former recollections ; and strongly believing that the principle of treating not only Cholera, but fevers, by antiseptic remedies is the true principle, I am anxious to make known and communicate what I think may be serviceable to the Profession of which I am still a member, and to the cause of relieving human calamities and suffering.

HENRY STEPHENS.

54, Stamford Street,
Blackfriars' Road, London.

CHOLERA:

AN ANALYSIS

OF

ITS EPIDEMIC, ENDEMIC, AND CONTAGIOUS CHARACTER.

" The wings of the pestilence are abroad,
And the shadow of death is around us."

At no period in the history of the world has this picture been more fearfully realised than at the present moment; for while other pestilences have ravaged cities and portions of countries, this fearful disease, which puts at nought quarantines and cordons, ravages almost simultaneously the east and the west, the north and the south; and while the New World is receiving the intelligence of its desolations in the Old, before there is time for preparation, it suddenly appears. Sometimes it lingers in its course, attacking in succession city after city —resembling the march of an invading army, and, amidst the general consternation which it creates, the cry is " What is it? — is it contagious? — is it an

epidemic? or is it malaria? and, what is contagion, epidemic, and malaria?—what are they?" We may answer, They are poisons—battalions of death, combating and competing with the productiveness of life—agents in the hand of the Almighty balancing the destructive with the creative influence:—in other words, An epidemic is an invisible something—travelling about—eluding our pursuit—inscrutable to our investigations—defying our resistance—rendering useless our precautions, and vanishing without our intervention. Contagion, on the contrary, is something more tangible, more capable of demonstration, more within our power and comprehension, and more susceptible of suspension and reproduction by our means. Malariæ, or endemics, are more the disorders of a place than of a season, appearing to depend upon locality, poisoning those who come within their influence, but not often going forth in search of victims. "But," says the inquirer, "these are but the signs and shadows of the pestilence; what is the substance, the essence, the nature of the poison?" "Aye, there's the rub." I answer, What do we know of the thousand agents and elements which surround us but by the results? What is life? What do we know of it but as a result—an effect? What is sight, intellect, sensation, &c.? Can we analyse them and describe their essence? No: and if we could, would they be more subservient to our purpose? We know the elements of the atmosphere; but can we decree that it

shall preserve its proportions? We can measure the elasticity of the air; but can we stay the burst of the storm? We may play with the lightning of the laboratory; but we quail as it swoops over us from the heavens. Fortunately for mankind, that which is inscrutable is not requisite to be known; and, on the contrary, that which is necessary can be acquired by investigation. It is sufficient for us to know that these things are the designs, the wisdom, and the power of God, of whom we know nothing but by these proofs of his might, omnipotence, immensity, and power! for

> "Beneath his footsteps the volcanos rise;
> His shadow is the pestilence; his path
> The comets herald through the crackling skies,
> And planets turn to ashes at his wrath.
> To him War offers daily sacrifice;
> To him Death pays his tribute; life is his
> With all its infinite of agonies,
> And his the spirit of whatever is."

ON THE PECULIAR CHARACTER OF CONTAGIOUS, EPIDEMIC, AND MALARIOUS DISEASES.

Epidemic, contagious, and malarious diseases have each a certain distinctive character—a certain ordinary property prominently marked; but, at the same time, there is a connecting link assimilating and occasionally blending them with one another, in like manner as in the animal and vegetable world there are connecting links between the different species. Thus an epidemic

disease will often, in my opinion, for a short period, when raging in situations favourable for it, as in crowded and unwholesome places, develope a decidedly contagious property, which property ceases again for a time, and is again manifested, so that an observer becomes puzzled—being satisfied at one time that it has no contagion, and at another that it has; it will also at times exhibit an endemic character, taking up its abode in particular districts, in low situations, observing the course of rivers, &c. Hence arises a wide discrepancy of opinion. Contagious diseases, as small-pox, measles, scarlet-fevers, &c., will at some period prevail simultaneously over a wide district, having universally a type and character of fatal malignancy which belong not to them under ordinary circumstances; and there can be no doubt there is some epidemic influence, some circumstance at such times, which give to them an additional character of extension and malignancy. Malarious or endemic diseases are ordinarily the diseases of a district, having a local origin and a local habitation, yet occasionally they will assume the march and character of an epidemic; for example, the intermittent fever, or common ague, the inhabitant of a marsh, will at times take up its abode for several seasons in districts where it had not been known for many years, the oldest inhabitant but barely remembering its former visitation, and at such seasons the ague districts are more than usually affected by it; but although usurping in

some degree the epidemic character, it never fails to preserve its original endemic tendency; for I observed some years past, when it first visited places and districts where it had been long a stranger, it made its attacks first upon those who were the inhabitants of a water-mill, or who lived in houses near to some river or low situation. It prevailed in this manner in select situations for many months before it became general, and after then it continued to preserve its predilections. It is this want of integrity in their character, this occasionally diverging property in these diseases, which sets at defiance nosological arrangement; and the medical philosopher who would arrange and classify these diseases,—who would set bounds and limits to their respective character, who would denominate them as exclusively belonging to one or the other description, will be mortified at finding his arrangement rendered nugatory by an array of facts subversive of his opinions.

Epidemic, contagious, and malarious diseases, it is clear belong to a class of maladies having many features in common, although at the same time possessing some imperfect and separate distinctions.

AN EXAMINATION OF THE PROBABLE MODE IN WHICH THE EPIDEMIC, ENDEMIC, AND CONTAGIOUS POISONS ARE INTRODUCED INTO THE SYSTEM.

Without going into the nature of epidemic, contagious, or malarious poisons, or dwelling longer upon the general signs of epidemic, contagious, or malarious disorders, I shall proceed to an analogical reasoning on the manner in which these diseases appear to me to be introduced into the system, and to influence the health and functions of the body.

It will, I think, be readily conceded that the disorders of the health produced by these peculiar diseases, are the effect of a something, whether floating in the atmosphere, exhaled from the earth, or concocted in the elements, or generated in animal bodies, matters not; but that this something is prejudicial to the healthy and vital functions of the human body. We will, therefore, for the sake of a definition, call them Poisons. The next question is, *Are these poisons generally or particularly prejudicial?* Have they a common pestiferous influence, the different effects being produced by one agency, and modified to their different appearances by the different constitutions of the individuals they affect? or, have they an individuality and character of their own, producing on their introduction to the human body, a chain of specific effects, constituting one particular and

nearly uniform disease. I think I need not argue long to convince my readers, that there *is* an individuality in each particular poison, which can produce but one train of affections, alike in kind, however they may differ in degree. The poison of an ague is attended by phenomena distinct in its kind, also small pox, measles, scarlet fever, hooping-cough, &c.; other diseases, as typhus fever, although without doubt the effect of a *distinct* poison, have yet results which are more in common with other diseases, and are less distinct and peculiar to themselves: for example, most of the effects observable in typhus fevers are met with in most other diseases which terminate in a low and putrid tendency; yet I never heard of a person taking a typhus fever from another dying of small-pox with malignant symptoms. Neither have I ever heard of a person taking typhus fever from a person dying of *scarlatina maligna*, or, on the contrary, small-pox or other diseases caught from one labouring under typhus, nor of a person taking typhus from another affected with the reactionary fever supervening on an attack of cholera. The next question is, How are these poisons communicated to the body, and how do they produce their effects? A natural reply will be, that, as these poisons are most probably ærial, the lungs appear the most likely method in which they are introduced into the body; that the organs of respiration are the receptacle, and through them their peculiar effects are disseminated to the different parts

of the body. This, I believe, to be the general and the most palpable belief, but if we examine the matter further, we shall find that this manner of accounting for the phenomena is more fanciful or imaginary than real; that it is the result more of a supposition than of a demonstration. It is true the air is, and consequently the poison may be, admitted into the lungs, and apparently into the body; but in the lungs the means of access to the body are not easier than through many other parts. The poison applied to the lungs must be absorbed to affect the body, and I see no reason why it cannot be as readily absorbed from any other surface as that of the lungs. The skin and the alimentary canal afford as ready a surface for absorption. If we examine analogically the effects of certain agents or poisons which affect the human frame, we shall, I think, be furnished with a clue to the phenomena of infectious diseases. It is a well-known fact, that numerous poisons, particularly animal, are poisonous only to particular parts, or, in other words, that there are particular parts of the body only, which are susceptible to the *primary* effects of particular poisons; for example, the epidemic ophthalmia is a poison which affects the eyes only; fever, or other constitutional disturbance attending it, is a secondary effect or consequence, and not primary. The poison of syphilis also affects, in the first instance, by primary sores, the constitutional effects being secondary as a consequence of the inoculation.

There is one particular disease which I think proves this fact, and by which I think I shall be able to show that many epidemic and contagious diseases are communicated to the system through the medium of one particular organ or part, by a species of combination or inoculation of *that organ*, and that the disease is then further communicated to the body, which becomes affected secondarily, but most influentially; and this disease is Puerpural fever. This peculiar fever attacks females only, and that only at one particular and peculiar time, namely, just after parturition. In all the cases of death, dissection has proved the uterus to be the primary seat of the disease. Its commencement is marked by pain in that region, and tenderness, which rapidly extends, influencing the body by apparently contaminating the circulating fluids. The uterus receives the first contaminating effect, through which the whole body becomes affected. The contagious effects of this disease it would appear cannot be communicated to the body but through the medium of the uterus, and that the uterus is only susceptible to its influence when it has been enlarged by pregnancy, and when the vessels of that organ are open from the recent casting off of the fœtal contents, and while its interior is a considerable secreting surface. The greatest susceptibility is immediately after parturition, and this susceptibility diminishes as the parturient state goes off, and as the uterus diminishes in its size, and gets into its natural condition.

The following case, which occurred in my practice, will illustrate this argument more fully, and will show that the uterus may be, when not impregnated, a means of communicating acute disease or contamination to the body.

A young girl, just about the period of her first menstruation, was seized in the night with a copious and exceedingly fœtid discharge from the uterus, after having had some sensations of uneasiness, such as usually occur at menstruation ; there was no apparent illness accompanying this discharge, no pain, and apparently nothing to apprehend. The discharge, while in the uterus, might have produced disease, but being discharged, it would seem to have effected a natural cure. The mother somewhat surprised and alarmed at the unusual occurrence of such a discharge, sent an account of the case to a medical practitioner at some distance, who was formerly their medical attendant. He expressed some alarm at the case, and thought she ought to be immediately bled, and have leeches applied to the abdomen, for he said it was a case of great danger: he had had two or three such cases and they had all died. I could not quite understand this opinion, but believed that he had taken a wrong view of the case, owing to some imperfect statement made to him, for I could not see any urgency or danger, the patient appearing quite well ; and I still considered if there had been danger, the discharge would remove it, and as there

was neither pain nor tenderness, I did not feel justified in bleeding a delicate girl who appeared otherwise well. In the lapse of a few days, decided marks of peritoneal inflammation came on, with great tenderness of the abdomen, great quickness of pulse, &c., &c. I now saw the danger of the case, and that experience had dictated the advice of the former medical attendant, who, I subsequently found had met with two similar cases before, which had been followed by the death of the patients. My case fortunately terminated otherwise. I bled, fomented, and gave calomel and opium freely until the mouth became sore, and she was salivated, which stopped the progress of the disease, and the patient recovered. My pathological explanation of this case was, that the fœtid matter in the uterus had contaminated that organ, which communicated itself to the peritoneum, producing a form of disease resembling puerpural fever, from an original local disease, or a contamination of the uterus.

In further illustration of this fact, that poisons are communicated to the body through other surfaces than the lungs, I may instance the poison of plague, which is communicated by the touch of a person labouring under it ; as it is well known that you may stand by a patient labouring under the plague with impunity, breathing the same atmosphere, but simple contact, whether of the clothes or person, is sufficient. The itch is also another

instance, where contact with the infected person or infected clothes is sufficient. That poisons are such only when applied in the particular way and to the particular part susceptible to its influence, is proved by numerous instances. Scarlet fever first affects the throat, the earliest symptoms being an ulcerated throat. The poison of serpents, so deadly fatal in its effects upon the blood, by direct contact, may be taken into the stomach with impunity. Not only are poisons peculiar to parts of the body, but poisons are peculiar to particular animals only, as witness the glanders so fatal among horses; but oxen and cows and sheep may be mingled with infected horses with impunity; but the ass is equally as susceptible as the horse. Numerous other instances might be named of these peculiar effects were it necessary. Should it be admitted, which I think cannot be denied, that poisons or infections first affect a part, and then the body secondarily, it will be asked,

HOW, UPON THIS SUPPOSITION, IS THE POISON OF CHOLERA COMMUNICATED TO THE HUMAN BODY?

I answer, through the medium of the intestinal canal.

In the attacks of cholera there is a preceding or primary effect, first produced upon the stomach and bowels. A large proportion of persons are, during the prevalence of cholera, affected with symptoms of indigestion, often in an extraordinary degree, with a frequent disposition to looseness of the bowels. These are the

primary though mild effects of the poison; but which, if unchecked, will often increase in degree until the worst stage of the cholera succeeds. Corresponding with the views I entertain, these primary effects may and often do, if I may so express myself, cure themselves, and are readily cured by medicine, and then of course the disease goes no further; but if from neglect, or from certain causes, as irregularity in diet, or from intensity in the amount or quality of the poison received, a greater degree of effect is produced, then are the symptoms more violent, the primary effect upon the bowels is more intense; the poison of cholera is I imagine generated along the track of the alimentary canal, which has the effect of inoculating the system more rapidly, or, in other words, of infecting the mass of blood, changing its character, and rendering it too thick to circulate, to secrete, or to carry on any vital functions with which it is connected, presenting in the still living body all the phenomena usually visible only in the dead, namely, extreme coldness of the surface, shrunken and livid appearance of the skin, eyes sunk, skin and nails blue, fingers shrivelled, cold flabby appearance of the tongue, and in addition to these, in the living body, is coldness of the breath, with a total suspension of all the secretions, among which, that of the urine is most remarkable. In ordinary cases of death, in the last act of life, the tide of the blood recedes, stagnates, and coagulates in the body; the solid parts depending for their fulness upon the blood which is flowing into them, shrink

and wither as it recedes; and in the collapse of cholera, the same effects take place, the blood recedes from the surface, it thickens and stagnates, and the same shrinking of the body occurs (but more rapidly), only in the one case there is *actual death*, and in the other the phenomena of death exist, while the body still lives.

As an additional proof of the correctness of the foregoing conclusions, the mode of preventing the development of the worst forms of this disease, corresponds exactly with the mode of preventing the secondary effects of many other poisons.

The constitutional effects arising from the stings and bites of poisonous animals and insects is prevented by curing the primary and local symptoms. Applications to a bite or sting, which remove or neutralize the poison, prevent the secondary or succeeding disease; and so in cholera, by curing the diarrhœa, which precedes the worst symptoms, the further and fatal effects are arrested in the same manner as by disturbing or preventing the primary effects after inoculation of any disease communicating in that way, the subsequent effects or disease is prevented. Excising, cauterizing, or any method or plan by which the local effects can be destroyed before the poison can be absorbed, prevents the development of further action. In like manner, when you cure the primary effects of the poison of cholera, the further progress is arrested.

Before going into the subject of the means of curing the primary effects, I will ask

THROUGH WHAT MEDIUM DO CONTAGIOUS AND MALARIOUS DISEASES PRODUCE THEIR DESTRUCTIVE EFFECTS UPON ANIMAL HEALTH AND LIFE?

I answer confidently, through the medium of the blood. Although, as I have stated before, the first effects of many of these poisons is to produce a local effect, which generates further poison to infect the system, in the same manner as small-pox inoculation, vaccination, syphilis, &c., all of which produce first a local sore, and generation of further virus, which, being absorbed into the blood, contaminates it, and produces the subsequent disease.

It is on the supposition that the poison in the bite of serpents is received into the blood, and circulating, contaminates the whole mass, that the remedy of applying a ligature between the bitten part (when the bite is in the hand, arm or leg), and the body is adopted, and the part sucked to extract the poison, which I am told has the desired effect, and if the blood can be contaminated in one way, why may it not in another?* and why this *rationale* of diseased action, this importance of the blood as a medium of communicating disease, has been so long laid aside, and so little noticed, it would be difficult to imagine.†

* I know by experience, that the surest way to prevent the stings of bees, wasps, &c., from taking effect, is to suck the part immediately.

† The importance of the blood as a medium through which diseases affect the system, occasionally creeps out in medical writings; but these views have too often been smothered amidst abstruse theories about nervous plexuses, local inflammations, &c.

In a similar manner as the poison of reptiles and other poisons contaminate the blood, and produce a rapid and simultaneous effect upon the whole body, so also in my belief does the poison of cholera act, with the exception that it usually produces a primary effect upon the stomach and intestines, which parts becoming themselves infected with a diseased action, generate further poison, which is taken into the blood, contaminating and probably destroying in part, and sometimes wholly, its vitality.*

The state the body presents, on dissection, is shown in the following quotation of a report of cases dissected:—

"The liver and vessels which pass to the *vena cava* inferior, *were tinged with blood. This turgescence* extended to the *vena cava* superior, to the right side of the heart, and, in some instances, to the left ventricle. Blood was in the same manner stagnant in the lungs, making a congestion of the whole venous circulation of the larger vessels. The blood in the vessels (arteries as well as veins) was unusually *black, resembling tar in colour and consistence.* It is worthy of remark, that this *local accumulation of blood* was uniformly found in all fatal cases,

* According to reports of cases, it does appear that the premonitory symptoms or primary effect upon the stomach and bowels do not invariably occur, and when there is an intensity of the poisonous influence, the effect upon the blood may be simultaneous with the effect upon the stomach and intestines, or follow so quickly as to appear simultaneous.

whether they were of rapid or slower termination, and was particularly evident, as might be expected, in those in which the oppression of breathing had prevailed with most violence."

Consider these appearances when dead, with the phenomena presented to the eye in the stage of collapse, when the circulation is gone, the body cold and shrunk, and all the phenomena of a corpse presented, except the remains of consciousness and motion—and what so likely to produce so suddenly those united characteristic appearances as the supposition of a poison infecting the blood, changing its character, depriving it of its vitality, if not wholly, in great part, turning it into a thick black mass, like tar, and thus suspending all the living functions depending upon it, by rendering that fluid incapable of circulating. That there is a suspension of the circulation of blood the living symptoms show—that the blood is so changed as to be incapable of moving along the vessels, is shown not only in the living, but in the dead body—that such changes of the blood must necessarily lead to a rapid extinction of life, is I think clear, and I cannot conceive of any other system of pathology which can account for these overwhelming, general and rapid effects, as the corruption and death of the circulating fluids, which, permeating to all parts, influences all, the healthy condition of which is essential to the well-being of the living body, the corruption of which carries its poisonous influence to every structure: this alone can account for that universal influ-

ence which is felt in diseases like Cholera and fevers, when dissection discovers no cause or alteration of structure in the solids, but, as in fevers, points to the corruption of the fluids and secretions, and traces their source in the contaminated blood, and in Cholera shows in the annihilation of all secretions, the incapacity and impossibility of this expired or expiring blood to carry on any functions.

I will here just state what is the prevailing notion amongst medical men with regard to the thickness and black appearance of the blood in Cholera. "It is caused," they say, "by the serum of the blood draining away during the primary effects of the disease, by which nothing but the thick or coagulated parts are left." This explanation is so plausible that I do not wonder that it has been so universally received; but this cannot be reconciled with the fact that, *in those cases where there has been little or no previous looseness, the same thickness and dark appearance of the blood, and shrunk appearance of every part takes place equally as when copious looseness has prevailed.*

Under the supposition that I may be correct in my opinion—1st, That the poison of Cholera is introduced into the body through the medium of the intestinal canal—that it then produces a local effect upon the intestines—that from this local disease the blood becomes contaminated, corrupted, and deprived eventually of its vitality, from which ensues the train of fatal effects;—upon this supposition being correct, it may be asked

ARE THERE ANY MEANS WHICH WILL PRESERVE THE BLOOD FROM THESE CONTAMINATING INFLUENCES, OR WHICH WILL RENDER IT LESS SUSCEPTIBLE TO THE EFFECT OF THESE POISONS?

My opinion is, that the remedy, if any, will be found in those drugs or means which have the power of preserving dead animal or vegetable substances from decomposition or decay.*

* The connexion between the causes which produce putrefaction and decomposition of dead organised matter, and those which produce or excite the action of Cholera and fever in the living, is exemplified strongly in the following case, copied from the newspapers:—

"Shocking Case.—On Friday morning an inquest was held before Mr. W. Baker, at the Town of Ramsgate public-house, High Street, Wapping, on view of the body of Samuel Coveney, aged twenty-three years, who died from Cholera on board the barge *Sarah*, under the following very shocking circumstances:—Sarah Coveney, the widow of the deceased, said her husband was master of the barge *Sarah*, and was in the employ of Mr. Cox, a lighterman, at Lambeth. For some time past the barge had been used to remove all kinds of dust, ashes, sweepings from streets, and vegetable matter, from Mr. Gower's wharf, Blackfriars, the city contractor, to Rayuham, in Essex, to be sifted, in consequence of its not being allowed to be done in London. About a week since the barge was loaded, and the deceased navigated the barge down the river. Witness and deceased were the only persons on board. They were unable to sleep in the berth in consequence of it being so close and confined, and the smell arising from the cargo was so dreadful, that they were obliged to sleep upon the locker for the purpose of obtaining fresh air. If a candle was lighted in the cabin, it would be directly extinguished by the foul air, and they were unable to keep the fire alight. Everything they had on board changed colour, *and if the meat and provisions only remained*

My reasons for this belief I will now proceed to explain:—

Animal or vegetable substances, when life is extinct, are immediately susceptible to influences which tend to decompose or reduce them to their natural elements, but *there are Agents* which will arrest this tendency to natural decay, and preserve the body or substance from decomposition for various periods of time, as is witnessed in the embalming of bodies, in preserving specimens of natural history, timber, provisions, &c. Now, if we ask,

WHAT ARE THE DRUGS AND MEANS USED?

We shall find that they fall under the class of what may be called *Antiseptics*, which word is derived from the Greek

in the barge an hour they would become tainted, and witness was compelled to throw them overboard. Witness was very ill when she first went on board, but had since recovered. The cargo was safely landed at Raynham, and the barge was anchored in the river, opposite Erith. On Tuesday night, about ten o'clock, the deceased, who had never had a day's illness in his life, was suddenly attacked with Cholera. Witness had no one on board to assist her, nor even had she any pure water to give to the deceased, who frequently complained of thirst. Witness had no candle, and the nearest house was about three miles from the place. Witness assisted the deceased on deck, and they both remained together until five o'clock in the morning, when the deceased died. She could not obtain any help until some time afterwards, when two young men came on board, and navigated the barge up to Wapping, and the body of the deceased was conveyed to the dead-house. The jury returned a verdict of 'Death from Asiatic Cholera,' and recommended the Coroner to write to the Board of Health, and inspect those barges laden with unsifted dust, &c., before they were navigated by lightermen. The Coroner said he would do so."

αντι *against*, and σηπω *to putrefy*, having a tendency to prevent animal substances from passing into a state of putrefaction, and of obviating putrefaction when already begun, and I confidently affirm that the beneficial effects found in this class of agents over many diseases, will be found in these antiseptic qualities.

The well-known effects of some of the salts of mercury in preserving animal and vegetable substances from decay, as in the example of the process of kyanizing wood, would, upon this principle or theory, lead to their being employed in curing and counteracting disease. And what are the facts? Why, of all the agents ever discovered by man, mercury is more universally relied on in the cure of disease than any other drug whatever. It had long been used in diseases of the skin before it was employed internally—it was soon found to be the chief and almost only remedy for the cure of syphilis, which is an animal poison. In the liver disease, to which Europeans are so liable in the East Indies, it was found to be the only certain remedy; and for a long time it was considered to have some specific and peculiar action over this disease. The large doses used by our Indian practitioners led to a more bold practice with it in this country, and by these means its great power over almost all varieties of disease began to be developed; and, notwithstanding the prejudices excited against it, as against all useful agents, this powerful remedy is, with all practitioners of experience, the right

hand of medicine. In typhus fever, what said the late Dr. Armstrong? "For a long time I overlooked one of the principal effects of calomel in congestive fevers, and at last it was only forced upon me, by patients *almost invariably recovering with rapidity* where salivation was excited," and my own experience confirms this fully; and indeed it was my practice, in all cases of fever, where I had apprehensions of the result, never to waste my time over useless drugs, or ponder over still more useless theories, but to steer at once for this haven of safety, and all other means used by me, were to facilitate and promote this desirable end. If I bled a patient in fever, it was not because I expected any beneficial results from bleeding alone, but because it would facilitate the action of mercury; the same with purging and warm bathing, which promoted the action of mercury upon the mouth. This once obtained, I knew my patient to be safe. Let it be understood, the decided effects of mercury are not observed in acute diseases *until the mouth is affected.* The effects observed by Armstrong over typhus is also found to be as uniform over other fevers. The yellow fever in like manner, leaves the patients whenever the mouth becomes fully affected, or the patient fully salivated.

Mr. O. Halloran, who visited Spain during the dreadful epidemic (yellow fever) of 1820, says, "in the majority of instances, the patients treated in the manner described will be under the influence of mercury on the third day,

after which their recovery is *certain and rapid.* They will generally walk about on the seventh day." He also states, "that *without a single exception* throughout the whole period of the epidemic, every patient in whom salivation could be induced, recovered."—See *Medico Chirurgical Review*, vol. ii., March, 1822.

It is well known that small-pox virus if mixed with a small portion of mercurial ointment, will take no effect. The powers of mercury over disease became, as I said before, gradually developed. Not only fevers were found to be cured by it, but inflammatory disorders of all kinds were found to yield to its effects.

I have seen one of the worst cases of phrenitis, or brain fever, I ever beheld, disappear at once on the occurrence of salivation; and it is my belief that if a person was exposed to the contagion of small-pox, and immediately put under a course of mercury and the salivation excited, that the disease would be either wholly prevented or much mitigated in its course. Indeed, I do not believe it possible to produce small-pox in a patient labouring under the full effects of mercury.

But acute diseases were not the only diseases benefited by mercury; chronic diseases of almost all kinds were found to yield to its influence. Were I to enumerate them, I should fill a catalogue. Mr. Scott, of Bromley, who obtained such deserved reputation for curing diseases of the joints (white swelling) effected his cures by the slow

action of mercury in the form of plaister to the part. Chronic diseases of the eyes I have seen yield to mercury after resisting every other remedy ; but I need not dwell further on its effects, so well known amongst medical men generally, although I am aware there are many still sceptical of these effects, and they will probably always remain so, as not relying on it they will never use it effectually.

In Cholera, the effects of calomel over it is amply testified to by the medical practitioners of our East Indian possessions, who were long familiar with it before it appeared in Europe.

In reports from the Medical Board of Bombay, which I extract from a work before me, published in 1832, by John V. Thompson, Esq., Deputy Inspector of Hospitals, it it said, "The practice of this place (Bombay), as sufficiently appears from Dr. Taylor's Report, bears ample testimony to the control which calomel possesses over this disease."

I may here briefly advert to my own experience of the effects of calomel over Cholera.

In the year 1832, in the district assigned to me in Christ Church, Surrey, the first case of Cholera occurred. The patient was a young girl about seventeen or eighteen years of age. She had the rice-water evacuations, extinction of the pulse at the wrist, sunken appearance of the eyes, and total suppression of urine; symptoms

which are indicative of the stage of collapse, but the pulse was perceptible in the brachial artery, and the heart could be felt to pulsate. My mind having been made up, before the appearance of cholera, as to the treatment I should pursue, which was to produce, if possible, salivation, I at once gave the girl twenty grains of calomel with one grain of opium, and followed it by ten grains every two and three hours, and the result was salivation and complete recovery. The amendment was palpable on the appearance of the mercurial effect, the secretion of urine returned as soon as salivation took place. Encouraged by this case I tried it in several other cases of collapse, but, alas ! I soon found that when the collapse *was complete* I had to deal as with a dead body. When the blood is stagnant all over the system, when every secretion is suspended, absorption must likewise be at an end; and, consequently, what remedy can affect a body dead to every external influence? I found it fail, as did every other remedy in these cases; but, in cases less violent, and where the vital functions were less completely suspended, my faith in it was more than confirmed. The following case will still further illustrate it:—

A man was seized with Cholera, and taken to our parish cholera hospital. He became my patient, and I soon saw that though his was a case of decided collapse, that it was less complete than in many which I had seen, and I immediately put in practice the same treatment as above

detailed, and with the same decided effect: the mouth became sore and the symptoms receded, and it was most gratifying to me to witness the joy and gratitude of the man and of his wife who came to see him. Believing that the mercury was in the ascendant and the man safe, I unfortunately consented to his abandoning the calomel, as he had taken a considerable quantity, which, as it had begun to affect his mouth, I thought might continue to operate, and would, perhaps, salivate him severely.* On calling upon him in the evening I found the mercurial effect apparently going, and I had a vague feeling that he did not seem so well, although there were no symptoms immediately alarming. On calling in the morning I found, to my great sorrow and mortification, that the symptoms of the collapse, or worst form of Cholera, had reappeared, and with so much intensity as to preclude all hope of recovery. *The effect of the mercury had wholly disappeared.* Soon after his wife came in. She had been led to consider him as safe, and it may be easily conceived what were her feelings on seeing this end to all her hopes. The man, retaining perfect consciousness, looked wistfully towards her, and shook his head mournfully and despairingly. I need not dwell on this piteous case—he died!

* Further experience satisfied me that there is little dread of the effects of mercury being excessive, when used for acute diseases, the chief hazard is, that a mild effect of mercury will be superseded and overcome by the antagonistic powers of the disease.

Into the effects of mercury over diseases, I shall not go further, but proceed to notice other drugs which have an antiseptic tendency over dead bodies, and have also a curative effect upon the living.*

The power of arsenic in preserving animal substances from decay, is well known; internally, it has not been used to the same extent as mercury, and therefore its powers have not been so fully tested. In diseases of the skin it has been found a valuable agent. In the ague it was long used as a quack medicine, under the name of *tasteless ague drops.* Some of the barks of wood are used in the arts for preventing the decay of animal sub-

* Many medical men are timid in the use of mercury from some undefinable dread of its future ill effects. I know of no effects of mercury that are not immediate, and they are generally trifling, and soon recovered from. Our East Indian practitioners, who have used them to a much larger extent than Europeans, see none of these evils, and deny it altogether. I can add my testimony to theirs by saying, that except the soreness of the mouth and some symptoms of irritation and disagreement occasionally exhibited, and which are transient, and seem to indicate that at this particular time it disagrees and should be discontinued, I have seen no permanent *serious* effect from its use. The mistake which professional men labour under is in attributing the effects resulting from the disease (syphilis) which mercury was first used for, to the drug itself; whereas this mercurial disease, as it was falsely called, was in reality (syphilis) unextinguished and reappearing, from the remedy not having been continued long enough. The peculiar symptoms falsely described as resulting from the use of mercury are never seen when mercury is used for the cure of other diseases, although more extensively used. This fact ought to have long since removed the prejudice against this invaluable agent over disease.

stances as exemplified under the process of tanning. The Peruvian bark and its salt, quinine, is the most certain agent over the ague or intermittent fever, and it is also preservative of dead animal matter. During the prevalence of the plague, the neighbourhood of tan-pits and tan-yards were found to be comparatively exempt from this disease. The dealers in pitch and tar, as also in tobacco, were found generally to escape it.*

I shall pass over many of the minor antiseptics, and come at once to one of the most simple but powerful preservatives against putrefaction or decomposition of all known substances, namely, *kreosote*. Its effects in preserving animal or vegetable substances from decay, I have tested in a variety of ways. Vegetable infusions will never mould if they contain only a small portion of kreosote. I have preserved blood for years, by mixing it with the crude oil from Stockholm tar, which contains kreosote, and is the chief agent in its preservation.

It destroys almost instantly the fœtor from animal fæces and other secretions. It almost immediately coagulates egg-albumen and serum. Meat and fish are preserved if kreosote is brushed over them. The preservative effects of tar and wood smoke are owing to the kreosote.

I have a strong belief that this powerful antiseptic will be found amongst the most efficient means of neutralizing

* These are all remedies in cutaneous diseases and antiseptics.

and counteracting the effects of contagious, malarious, and epidemic diseases. If you can sufficiently impregnate the system with it, I expect its preservative effect upon the blood would counteract and prevent these diseases from communicating themselves to a body so influenced. I do not think it unreasonable to suppose that an agent, which is so powerful in preventing the natural decomposition of those substances which compose the animal fabrics, should exert a powerful effect in preventing the deteriorating agency of those influences, which produce decomposing changes in animal bodies. Should this prove to be the case, there will be developed a principle in the action of remedies of the greatest practical value.

The following are among the drugs or agents which have a strong antiseptic tendency:—Kreosote, mercury, arsenic, nitrate of silver, alum, carbon, the salts of copper and iron, pyroligneous acid or wood vinegar* (containing kreosote, to which it probably owes its effect); the barks of wood (particularly cinchona), alcohol, naphtha, and essential oils, these all coagulate albumen, &c. Wood vinegar appears from the statements of Pliny to have been amongst the most essential of the means used by the ancient Egyptians in preparing their mummies.

Before going into the subject of the uses or the mode

* The crude pyroligneous acid is preferable to that which has been purified, as it abounds more in kreosote.

of application of any of the above antiseptics, I will proceed to give my reasons for thinking the Cholera

A CONTAGIOUS DISEASE.

In almost all the controversies which I have read, the question seems to have been, simply, Is it an epidemic or contagious disease? and the writer who advocates that it is not contagious, finds out instances where the disease has arisen without any contact or communication with infected persons, and exhibits these as proofs that it is not contagious. The question, whether a disease may not be *both* epidemic and contagious, seems never to have entered into his imagination. The disease must in his idea be either contagious or epidemic, and as its epidemic tendency is widely established, the proofs are of course numerous; and if it must be either one or the other, he decides that it must be epidemic, and *therefore cannot be contagious.* Typhus fever is both epidemic and endemic, and yet I conceive there are not many now who will deny that it is occasionally contagious. My reasons for believing cholera to be contagious, are the following:—

1st. In its course from one country to another, it is observed to travel along the most frequented roads of human intercourse.—2dly, That if a person who has been exposed to the influence of Cholera, and has had premonitory symptoms, should be removed to a spot where the disease has never prevailed, and becomes worse and

subsequently dies, others, and those attendant upon him, often become the subject of it, and in this way the disease has often originated in a locality previously free from it. In the present outbreak of Cholera, several instances occurred where it commenced on board ships coming from Hamburgh (where it prevailed) to ports in this country; and some of the crew after coming on shore were affected and died, and immediately the disease commenced amongst those who were in direct attendance upon them, and thus it was disseminated. When the disease broke out in the pauper establishment at Tooting, many of the parishes removed their children to their own unions; several of these children became affected with the disease and died, and it spread immediately in these hitherto healthy quarters.

In the year 1832 or 1833, a gentleman was proceeding from London to St. Albans to a dinner-party. He had slight diarrhœa when he left London, which increased on his journey, so that, as his groom stated, he was compelled to stop several times on the road. He dined, and after dinner was suddenly seized with cramp and all the symptoms of the worst form of the disease. In the extremity of this sudden attack, the housekeeper was called to be his nurse and attendant. He died: he had scarcely been buried before the housekeeper was seized, she also died; and in a very short space her husband, who was butler or steward in the establishment, was attacked

and died. No other case of malignant cholera occurred at St. Albans. I think it can scarcely be denied that this is strong in proof of contagion.

Because persons in attendance upon cases of cholera often escape; this is considered proof of its being non-contagious. It is well known that some persons are not susceptible of the disease, and most likely those persons who are in attendance on these cases are more than usually on their guard, and take precautions on the slightest appearance or symptom; but, notwithstanding, they do often die of it.

The following extract from a letter of Captain Sykes to Dr. Milne, communicated by Sir Gilbert Blane, and dated Punderpoor, 15th August, 1818, appears to be strong evidence. He says, "In my light company there were three or four men taken ill at once; of course there were attendants from the same company upon these men. The disease went on increasing in that company, and there have been more cases of cholera in it than in any other." Also a Mr. Duncan states that "while the 34th regiment were on the route from Bellore to Bangalore, Cholera appeared amongst them, and every intermediate town through which they passed betrayed symptoms of the infection soon after their departure." There are instances also of troops previously healthy passing through infected places, taking the disease, and being afterwards joined on their march by healthy regiments, who also

became affected soon after they joined the infected regiment.*

The contagious nature of this disease is, I believe, often denied, not from conviction, but from an amiable feeling of preventing alarm: I have never known any good from concealing truths. To know that a disease is sometimes contagious, and to be well prepared to counteract its effects, is better than to be lulled into a false security, and thus to become an easier prey.

Although contending for the principle that Cholera exhibits a contagious as well as an epidemic and endemic property, yet we must not lose sight of the fact, that it originates independently of contagion, although the latter may and often is one of its means of extension. Rivers, marshes, ditches, effluvia of decaying matter, attract, or probably under some peculiar modification of meteoric, atmospheric, or electric condition originate separately and independently the poison of this disease. How it is produced we know not; but we do know the fact that it is in those situations it commits its greatest ravages; pointing

* No policy can be worse than that of congregating human beings together in times of Cholera. Individual cases often occur and spread no further; but when the disease breaks out in barracks, hospitals, gaols, &c., there usually follows a number of victims. In the 62nd regiment, stationed at Devonport, one of the men died at his own house, and in consequence an order was issued calling all the married men into the barracks. The disease quickly broke out amongst them and many died. This occurred only recently.

out to the observer the necessity of draining and cleansing. Where the locality is such that miasma cannot be removed, then persons should retire to healthier spots; but as in many instances this cannot be done, means should be taken to close up drains and cesspools, by some ready and economical contrivance such as the following :—Place some planks over the drain or cesspool, and cover them with layers of straw or other appropriate covering, over this spread puddled clay, which being impervious to water, would be so to the effluvia arising from it. As an adjunct to sanitary measures I strongly recommend this, or some such means, as I think it preferable to cleaning out ditches, cesspools, &c., at times when Cholera is prevailing ; for many have fallen victims to this disease whose attack may be traced to this unwholesome employment ; and besides I question if the stirring up a stagnant ditch or pool in Cholera times is not more dangerous than letting it remain.

There may be, and undoubtedly often are, cases in which it would be impracticable to cover up a drain or cesspool in the way I have described. In such cases, and indeed in all cases of ditches, &c. from which bad smells emanate, the following cheap and simple expedient would be an excellent adjunct to other measures :—Pour into the ditch, drain, or cesspool, some Stockholm tar—(or a cheaper product may be obtained, and which is equally, if not more effectual ; namely, the tar obtained from the destructive distillation of wood in the process of manufac-

turing pyroligneous acid). There is also the oil of tar, which is also a cheap product, and is probably more convenient for the purpose. By pouring either of these substances into the ditch, drain, or cesspool, the surface will be covered with a floating film, which will prevent noxious exhalations, and by its strong antiseptic property, being impregnated with kreosote, will arrest the progress of decomposition.*

Charcoal has been long known for its property of purifying fœtid water, and rendering it fit for various uses. Fresh burnt charcoal has the property of absorbing several gases. I should, therefore, recommend it to be thrown into cesspools, &c. Common salt and alum are more or less antiseptic in their properties, and may be thrown into cesspools, &c. The nitric or muriatic acid may be in some cases poured in. Dry chloride of lime might be placed in some convenient vessel within a drain, or in a

* The following communication from an elderly person has been related to me, and as it confirms my belief in the efficacy of kreosote and its compounds, I will here relate it. In a conversation about Cholera, this person said, "If you would only burn some tar in the house, there would be no danger of Cholera, or fever, or plague of any kind." Upon questioning her as to the source of her information, she stated, that when she was very young, she remembered an old soldier relating, that when he was with his regiment in the West Indies, the progress of the yellow fever was stopped by burning tar mixed with brimstone; and that this composition (tar and brimstone) was regularly served out to the men every day for the purposes of fumigation. As this occurred probably three quarters of a century since, it has most likely been lost sight of.

float upon the surface, and some sulphuric acid poured over it; this would soon evolve considerable quantities of chlorine gas, which in this way would diffuse itself along the drains, &c. In such case the drain should be a covered one, as this gas, if generated too largely, is of a suffocating character. In my opinion, the expedient of pouring in tar, or oil of tar, as above described, will be the most permanent and effectual preventive of contamination from these sources.

I will now advert to

THE MEANS MOST LIKELY TO COUNTERACT, NEUTRALIZE, AND PREVENT THE DEVELOPMENT OF THIS POISONOUS AGENCY, IN THOSE EXPOSED TO ITS INFLUENCE?

To arrive at something like a satisfactory conclusion to this question, we must reason somewhat upon the properties which this poison exhibits.

1st. This poison is found to prevail wherever there are bad smells, damp, watery exhalations, &c. Now we find that wherever these circumstances prevail hydrogen is somehow or other connected with it. Hydrogen is the medium through which smells are communicated; almost all bad smells are some combination with hydrogen, and the effects of some of the combinations of hydrogen resemble, in some degree, the effects of Cholera.

"Hydro-sulphuret of ammonia acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries." (*Vide* Duncan's *Edinburgh Dispensary.*) It will be perceived that these effects resemble (differing only in degree) some of the effects of Cholera, and it is not unreasonable to suppose that the poison of Cholera, whatever it may be, has a property of combining with hydrogen; hence its predilection for those situations where hydrogen abounds, and hence may be inferred the value of those means which have the effect of decomposing hydrogen.

Sulphuretted hydrogen is very deleterious even when largely diluted with atmospheric air. According to the statement of Dupuytrin and Thomand, a small bird died immediately in air containing only 1500th of sulphuretted hydrogen; one 800th killed a middle-sized dog, and a horse perished in an atmosphere containing one 150th. It is well known to abound in foul sewers. It cannot, therefore, be doubted that it is intimately connected with the poison of Cholera, either by the property of combining with or attracting it.

It is, therefore, no more than reasonable to infer that agents which have the power of decomposing hydrogen, should be most powerful in counteracting the effects of epidemic miasma; poisons which show their predilections

for situations where hydrogen and its compounds abound.* Chlorine, iodine, and bromine instantly decompose sulphuretted hydrogen. Nitric acid also decomposes it and precipitates the sulphur.† I should, therefore, recommend that these agents should be diffused in the form of vapour in houses, apartments, and neighbourhoods where Cholera prevails. Some of these remedies are of easy application.

NITRIC ACID VAPOUR —THE MODE OF USING IT.

First put half an ounce of saltpetre into a saucer, and place it in a pipkin of heated sand, then pour upon it two drachms of sulphuric acid. The fumes of nitric acid vapour will immediately begin to rise. If the apartment is large, or there are many rooms, several pipkins may be used. If the vapour inconveniences much the windows and doors may be opened to ventilate. This vapour is

* The hydrogenous compounds would seem to be most injurious when in combination with vapour. Thus, in a moist atmosphere, they are more injurious than in a dry one.

† The power of concentrated nitric acid as a decomposing agent and solvent of organised matter, would astonish the spectator who, for the first time, witnessed it. Were a human being to fall into a vessel of concentrated nitric acid, so as to be covered, he would be gradually dissolved—clothes and everything would disappear, with trifling exceptions, and the new compound formed might be poured as a liquid from one vessel into another. Human fæces are instantly dissolved in it, and all fœtor as instantly destroyed.

not injurious or deleterious to life, and may be diffused without occasioning any material inconvenience.

I believe it will be found that in chemical manufactories where nitric acid is made or extensively used, as in oxalic acid manufactories, that the workmen seldom, or if I am rightly informed, are never the victims of Cholera. It would be a most valuable object and one to which the attention of sanitary commissions should be directed, namely, to ascertain what occupations, and what peculiar manufactures procure an immunity to the workmen against this disease. May not the comparative freedom of the town of Birmingham from this disease be owing to the nitric acid so extensively used in dissolving and refining metals, and to the quantity of nitric acid manufactured there?

Chlorine gas, from its property of combining with hydrogen and altering its character, is a powerful disinfecting agent, and has been much recommended.* The most convenient way of using this, in my opinion, is, to

* The disinfecting power of chlorine is usefully exemplified by the following experiment. A piece of meat, tainted and unfit for culinary purposes, may be restored, and rendered perfectly sweet and fit for food by the following process:—Put the meat into a saucepan along with some dry chloride of lime, and pour water in to cover it; place it over the fire until it simmers, then take it out and rinse it well in water containing salt. The chlorine gas will have destroyed the smell, and the heat will have driven off most of the gas; that which remains will be taken out by the salt and water, and when boiled afterwards it will be good to eat. A portion of its flavour may be lost, but the difference will be very slight.

take a small quantity of the powdered chloride of lime, and pouring on to it some crude pyroligneous acid, which combines with the lime, and liberates the chlorine in the form of gas ; but as this gas is too powerful to be used largely, small quantities should be used, and frequently repeated. I prefer using the pyroligneous acid to the sulphuric, as the object should be not to diffuse suddenly a large quantity of chlorine gas, which might produce inconvenience or injury, but rather to effect a slow disengagement—this the pyroligneous acid does.

The above gases have a chemical decomposing action upon hydrogen and its compounds, and therefore may be considered in the light of purifiers and disinfectors.

I shall now pass to the consideration of those agents which do not act by decomposing the products of decomposition, but which exert their power in arresting and preventing decomposition altogether ; and these I would consider more in the light of agents which act, not by decomposing the poison, but by preventing its effecting those changes in the vital functions which lead to the development of disease; such I consider to be the action of antiseptics.

I will not prolong this treatise by entering into a lengthened detail of the mode of using all the varieties of antiseptics, but will simply detail the plan I should pursue in cases where I apprehend the diseases might occur, or when symptoms threatening it took place.

If I were exposed to the influence of the poison of Cholera, by dwelling in crowded and unwholesome places were it prevailed much, or was in the habit of attending Cholera patients, I should watch particularly all disturbance of the bowels and digestive organs. The bowels being, as I believe, the medium through which this poison communicates with the body, I should endeavour to stop all looseness as soon as it appeared, believing that this looseness is either the primary effect of Cholera, or that it subjects the bowels to be more readily acted upon by the poison. To be brief, I should consider that if I shut up the bowels and prevented all loose evacuations, that I turned the key upon the disease. I should therefore labour, if possible, to produce rather a confined state of the bowels than otherwise. I should also, in the way of diet, confine myself to a concentrated form of food ; namely, that which contained most nourishment in the smallest compass, by which the necessity of too large a quantity of food would be avoided, and the bowels therefore not so subject to accumulation and frequent evacuations. I should take occasionally, if any symptoms of flatulence appeared, a tea-spoonful or more of brandy, with a few drops of laudanum in it, alcohol being a ready means of stopping the fermentative process. Besides these means of precaution, I should, in cases where death occurred in a house from Cholera, use means to neutralize the poison by fumigation, &c., such as I have before described ; and in addition, I should diffuse the vapour

of mercury in the apartments, by throwing occasionally from ten to fifteen grains of red sulphuret of mercury upon red-hot iron.*

In every case where a person had been officiating in attendance upon any one who died of Cholera, and who felt any symptom of being unwell, I should strongly urge him to take from ten to twenty grains of calomel, with from one grain to one grain and a half, or even two grains of opium, as by this means he would, in all probability, anticipate the action of the disease should the poison be lurking within him; and, in such cases, to ensure safety is everything. Several cases have occurred within my own knowledge in which, had this course been adopted, I strongly believe several lives would have been saved, but waiting until the disease is decidedly developed throws away the time for action.

Having strong faith in the antiseptic powers of kreosote, I should recommend every person to carry a small bottle in his pocket, and take one or two drops on a lump of sugar, and place it in his mouth as a lozenge, letting it slowly dissolve; or he may drop two drops into about a tea-spoonful of brandy, and take that occasionally; if the bowels have any tendency to loose-

* I should not wait until some one complained with symptoms of the disease, but I should put these means into active operation immediately to disinfect the places and persons.

ness he may add five, ten, or twenty drops of laudanum to it, or more.

As soon as Cholera appeared in London, I caused to be prepared some medicine for gratuitous distribution in a neighbourhood surrounding which Cholera prevailed very extensively in 1832 and 1833. This medicine has been given to a large number of persons, some with symptoms highly threatening. In that locality it has acquired a reputation, and is frequently applied for.

℞ Ol. Menth. Pip., ℥j.
Ol. Cassia, ℥j.
Kreosote, ℥j ää ℥ij.
Spt. Vin. Rect., ℥v.
Tinct. Opii., ℥ss.
Spt. Ammon. Arom., ℥iv.
Misce et adde Aq. Distill. ℥xxxiv.

This makes a quart imperial measure, and of this from half an ounce to two or three ounces may be taken, and repeated according to the urgency of the case.

Should any symptom arise more threatening, such as more violent diarrhœa, attended with vomiting and any nervous agitation, I should then give twenty grains of calomel with one or two grains of opium; and in two hours give another dose of five or ten grains of calomel with opium, according to the urgency of the case, repeating it if the symptoms were still threatening; and, indeed, I should proceed to get the system under

the influence of mercury as quickly as possible, believing *that then, and then only,* could the patient be considered safe. Inhaling the fumes produced by throwing half a drachm of the red sulphuret of mercury upon redhot-iron, is said to produce salivation more quickly than when mercury is taken internally. You should remember that in this disease (Cholera) you are running the race with an enemy who gives no time—who, if you wait, will overtake you. It is a contest as to who shall affect the system first—you, by the power of mercury, or Cholera with its subtle, rapid, and overwhelming poison.*

The testimonies from our Indian possessions in favour of blood-letting are so strong, that I should have recourse to it upon the principle that it will facilitate the action of mercury.

To those medical men who have not the same faith and confidence in the power of calomel as I have, I would suggest a trial of the following agents, each of which, by its effect of coagulating albumen, I should expect to be beneficial in the early but threatening stage when there is rice-water evacuations:—Alum dissolved in water; kreosote in pyroligneous acid; nitrate of silver in the

* I am impatient when I read of small doses of calomel recommended in threatening cases of Cholera. It is like telling a person to be careful and take time when cutting through the rope that is strangling a suicide.

proportion of one grain to the ounce; perchloride of mercury in doses of half a grain, dissolved in four to six ounces of water. These may be combined with laudanum in twenty to forty or sixty drops for a dose.* The effect of the nitrate of silver in coagulating albumen, and changing the appearance of diseased surfaces in external sores, to a healthy appearance, would lead me to expect much from it. But it must be borne in mind, that in simple diarrhœa, opiates with essential oils and kreosote will cure the majority of cases; but when the diarrhœa resists these means, I should try either the perchloride of mercury, or nitrate of silver; and should the symptoms still continue and cause alarm, I should affect the mouth as speedily as possible with mercury, and probably this could be done more readily with the corrosive sublimate or perchloride of mercury than with calomel. It would have this advantage, that in solution it would apply itself to the whole interior surface of the intestines; and if, as I conjecture, there is a primary effect produced upon the mucous lining of the intestines, it might arrest this primary disease, and prevent further effects; and although as regards the local effects upon the mucous lining of the intestines, it would be perhaps inferior to nitrate of silver, yet as it would, if absorbed, be producing

* This quantity need not be all drank at once, but at frequent intervals.

its antiseptic effect upon the blood, it would be more to be depended upon.*

In spite of all our endeavours to prevent it, should the stage of collapse take place, I advise the operation of transfusion or saline injections into the veins, as suggested and practised by Dr. Stevens on the first invasion of Cholera in 1832 and 1833, not with the view of curing the complaint by that means, as, however it might produce the astonishing effect of apparently reanimating and restoring the stagnant circulation, was almost always, I believe, followed by a relapse into the state of collapse. My purpose in recommending it would be, that as it restored the circulation, it afforded time and opportunity to throw in the mercury, which might purify the infected blood, and perhaps permanently cure the disease. This remains of course to be tried, but in these hopeless cases, every expedient that affords a hope and a prospect should be had recourse to.

The above are the means and remedies I should recommend with most confidence.

In this short Treatise I have endeavoured to include as many practical hints as I thought might be useful, without much regard to order or arrangement. I have written it

* These remarks are to be considered in the light of suggestions to trials in cases not so immediately threatening, but the testimonies in favour of mercury are so strong that I should not be justified in losing time in their use in urgent cases.

in time snatched from other occupations. I am impressed strongly with the value of the principle I have suggested, that to antiseptics we must look for the curative means of Cholera, and not only of Cholera, *but of all malignant fevers;* but I have still this conviction, that if we find a remedy which will arrest this disease, Cholera, with certainty, it must be before collapse is complete. When that stage is fully established, the Disease will be found to have triumphed, and Art must resign the contest.

THE END.

C. WHITING, BEAUFORT HOUSE, STRAND.

ON

THE TREATMENT

OF

ASIATIC CHOLERA.

BY

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ON

THE TREATMENT

OF

ASIATIC CHOLERA.

THREATENED as we are with another visitation of Asiatic Cholera, it is incumbent on all those who have had experience in the treatment of it to communicate the result to mankind. More especially is this due to the members of the medical profession, many of whom, though now highly qualified, were not of an age, or in a position, on the last occasion of its ravages, to have witnessed them, or to have profited by what they saw. There are, besides, a number of the more experienced who can scarcely feel satisfied as to the proper mode of treatment; for, from the partiality with which it attacked some places, while portions of other districts entirely escaped, it was almost unseen by numerous persons of extensive practice.

There exists also a source of danger from erroneous directions put forth with the weight of imposing authority; as, for instance, from the Board of Health, in the "London Gazette" of the 6th October, in which the instructions given are inefficient, and partly erroneous. In pointing out what I know to be useful in the way of remedies, these errors will be made sufficiently evident.

But, as it may be asked upon what authority I come forward so confidently, I may be excused for stating, that I have

grown grey in the service. It is some years since other professional engagements compelled me to retire from the London Hospital, one of the best medical schools in Europe, where I had taught for twenty-five years. Hundreds of medical men who were my pupils during that period are now practising in London and various parts of the world. The fourth edition of "First Principles of Medicine" has been translated in France and Germany, and reprinted and published in the United States of America; so that there are several thousand copies in the hands of the profession, containing the views upon Cholera which are here again advocated; and I have not, either in conversation or in print, yet met with any attempt to controvert them. In a matter of this nature, upon which such conflicting opinions are advanced, it seems necessary to offer some kind of credentials, which must be my apology for so much otherwise apparent egotism.

In the work just mentioned, my views are entered into at some length; here, for the present, I may simply state that Cholera is a species of fever. This is already granted by some; to others, who hear it for the first time, it may seem a startling assertion, and, until they are convinced, it will of course be difficult to induce them to use the proper remedies, namely, fever medicines, and to avoid what is hurtful, *i.e.* stimulants.

Ague is a kind of fever, so is small-pox; the cold shivering produced by internal inflammation is a febrile state. How different is the first accession of these diseases to what occurs afterwards; yet not more unlike than the first cold stage of Cholera to the second or *febrile* state, which at first was not recognised, because so many died in the previous cold stage; and even in those cases where death did not occur until the febrile heat commenced, the medical attendant, being generally a novice in this disease, supposed that this (in reality febrile) heat was a beneficial result of the stimulants he had administered.

The cold stage of what is called "Fever and Ague" is as like Cholera as may be,—cold surface, shrivelled skin of hands, livid face, crampy pains in the limbs, pain in the

stomach, headach, faintness, nausea or vomiting, and sometimes diarrhœa, in which case, of course, little or no urine is passed.

At the accession of Small-pox, the patient is violently sick, with shivering, and pains in the stomach, back, head, and limbs.

A patient with suppurative inflammation of some internal organ,—the liver, for instance,—will become pale and cold, the hands and feet cold as ice, his teeth will chatter, and the whole frame shiver; he will also have the pains in the head and back, and faintness. In such cases as the latter, the medical man, having previously known the existence of the inflammation, which has arrived at such a height as to produce these symptoms, does not attempt to relieve the patient by hot brandy and water, but rather strikes at the root of the disease, the inflammation, by what are called fever-medicines —antimony and salines, with leeches, &c.

When the shivering, sickness, and pains preliminary to small-pox commence, will the practitioner, if he be aware of the nature of the case, give hot brandy and water? Will he not, on the contrary, try to mitigate, by fever-medicines, the feverish symptoms which he knows will supervene?

In the cold stage of ague, it is well ascertained that nothing cuts short the shivering, and other miserable sensations, so effectually as an emetic, and that it does so without the aid of any artificial external heat.

Thus we see, that when medical men are thoroughly acquainted with a disease, they follow in many instances that practice which is called indirect and is the most efficacious. Such indirect treatment I know to be the most sucessful in Cholera, the remedy for this disease being:

Water, half a pint.
Tartar emetic, two grains.
Sulphate of magnesia, half an ounce. Mixed.

The dose is, for an adult (from fifteen years upwards), a table-spoonful every half hour; for a child of a year and a half

or two years, a tea-spoonful; and for the intermediate years, a proportionate dose.

External heat is useless. I have found the attendants scalding their hands in applying flannel wrung out of hot water, bags of hot bran, and other fomentations, without effect; these I have always put aside, and, generally, by the time the patients had taken the third dose (if not before), they have described a sensation of warmth creeping over them. The first or second dose usually begins to allay the nausea and diarrhœa.

I am not so absurd as to assert that this treatment is infallible, there being of all diseases, as scarlatina, small-pox, jungle-fever, cholera, &c., different degrees; from that which kills in three or four hours, to that which never confines the patient to bed: one individual will be so slightly attacked as to be able to walk about during the whole course; another dangerously, but still within the reach of medical skill; a third mortally—the dose of the morbid poison of the epidemic imbibed by the patient being so deleterious that no human aid can avail, any more than if a cannon-shot had passed through his body; the violence of the attack resembling the severe epidemic fevers of hot climates, where soldiers have been known to drop down on parade, and die in a few hours.

Cholera patients should be allowed to drink freely of quite cold water; it is the only beverage agreeable to them, and is useful in relieving the sickness and other symptoms. As soon as the urgent symptoms are checked, it is useful to give five grains of calomel, because the liver suffers similarly to what it does in ague; but if the calomel be taken before the vomiting is stopped, it may, of course, be lost. Bisulphate of quinine, also, should be administered from the first day, analogously with ague,—a grain or more every fourth hour, and as long as the skin continues dry, and warmer than natural, as alluded to above; half a dose of the fever-mixture should also be given each time with the quinine.

The diet should be nutritious, but light, as the tone of the stomach is greatly diminished; at first nothing is better than milk mixed with water, arrowroot, gruel, &c., given cold,

until the patient's own sensations make him prefer them warm, which is evidence of a return to a more healthy state; in this respect the patient's own wishes must be attended to.

Dry friction seems to be the only useful external application.

When the fever-medicine cannot be quickly obtained, it is well to be acquainted with a ready substitute. The following will be found to have much influence, though it certainly is not so efficacious as to allow us to dispense with the mixture, if it can possibly be procured.

Half a pint of water.
A large table-spoonful of common table-salt.
A large table-spoonful of flour of mustard. Mixed.

The doses the same as of the former.

Mustard is a well-known emetic; but it is not because it, or tartar emetic, or ipecacuan, or sulphate of zinc, &c., in large doses, produce vomiting, that they give relief, but because the emetic substances and salines, in divided doses, have an effect on the nerves of the primæ viæ, that counteracts the effects of the epidemic poison which produces the phenomena of cholera, ague, and other febrile states.

Several other prescriptions might be given, containing metallic and other salts and emetic substances; but it is unnecessary to enumerate them, as they act on the same principle.

The "sal volatile," recommended in the manifesto of the Board of Health, is not hurtful as to the medicine itself, but inefficient; and the "hot water," ordered to be given with it, is positively injurious. The next thing there recommended is "hot brandy and water," which is also injurious: as must be known by every person, medical or not, hot brandy and water is inconsistent with fever-medicines in feverish disease. If the patient does not die in the cold stage, the quantity of brandy in his inside will add to the fever when he arrives at the warm stage; and practitioners who formerly witnessed the Cholera will recollect having sometimes seen a

patient begin to get warm during such treatment, as if benefited by it; whereas this incipient warmth indicated the commencement of the second stage of the disease, and not relief from the disease, for the patient precisely at that period died, to the disappointment of all around him.

It would be difficult for any person unacquainted with the phenomena of "fever and ague" properly to understand this subject.

One of the instructions of the Board is, "in a word, to do every thing practicable to procure a warm general perspiration until the arrival of the medical attendant." Did the writer of this ever see Cholera? Can any human means procure a warm general "perspiration?" The first change, whether beneficial or otherwise, must be into a gradual restoration of *dry* warmth, not *perspiration*, which, as shewn above, caused many to be deceived as to the operation of stimulants. The other directions of the Board, which are not incorrect, are hackneyed truisms: "to keep the feet dry, the chambers ventilated, not to drink to intoxication, to wear flannel next the skin in damp cold weather." There is also a caution against "the use of cold purgative medicines, except under medical direction," as if the English were in the habit of using "drastic purgatives of all kinds, senna, colocynth, glauber salts, &c.," as part of their diet. Then there is the common fallacy of confounding *post hoc* with *propter hoc*, when one event follows another, assuming the former to be the cause of the latter, where there was merely precedence of time. For instance, Cholera has occurred after a hearty meal, wherefore, strong men, sailors and others, with good appetites, after working hard, must go to bed supperless, for fear of the Cholera!

But worse still, war is declared against vegetables and fruit, a most useful and healthful part of our diet, which physiologists shew, from the formation of our teeth, we were intended to consume, if it were not enough for our guidance that a bounteous Providence has given them to us as a useful admixture with animal food for the preservation of our health.

But because some poor creatures, who could not afford better diet, had fed upon "plums and sour beer" previously to being attacked with Cholera, "fruits of all kinds, though ripe, and even cooked, and whether dried or preserved," are interdicted, as well as "green vegetables, whether cooked or not." Whereas, on the contrary, good vegetables and ripe fruit, by preserving a healthy state of the blood and secretions, are calculated to give strength to resist an epidemic influence. "Pickles," too, are forbidden, though the antiseptic properties of the vinegar and spices used in their composition are calculated to prevent, not promote, Cholera.

There is one paragraph still requiring comment, as it contains a libel on human nature, implied by the statement that the opinion of Cholera being contagious "leads to the neglect and abandonment of the sick." I must say that this assertion is totally inconsistent with my experience; for in an extensive field of observation, for nearly forty years, in hospital, dispensary, and private practice, as pupil, professor, and physician, from the palace of the rich to the hovel of the poor, I have always had great difficulty in restraining relations, friends, and attendants from unnecessary exposure of themselves to danger, in fevers and other infectious diseases, and cannot recollect a solitary instance of the "neglect" alluded to.

For the purpose of demonstrating the mode of treatment recommended, I may add a couple of cases taken from my note-book; the first having all the marked symptoms of the worst form of Cholera from which patients can recover.

March 14th, half-past ten, P.M.—W. H. M. aged 40, had been out attending to business, and rode in an open carriage from about 3 till 5 P.M., in good health and spirits, as remarked by his wife. About 6 P.M. attacked with pains in limbs, back, and abdomen, chilliness and coldness of the skin, with frequent vomiting and purging; supposed to have had thirty watery motions up to the present time; the matter passed like rice-water, with white farinaceous-looking sediment; no urine, thirst, but tongue clean, moist, and cool; pulse 110; very feeble, countenance cadaverous, skin livid

(blue-black), hands cold, and the skin shrivelled; fingers crooked like a bird's claws, and in pain from cramps in hands, arms, feet, legs, neck, and trunk both back and abdomen; voice shrill, complains chiefly of the cramps, cold, and nausea. Ordered antim. tartariz. two grains, magnesia sulph. half an ounce, in half a pint of water, a table-spoonful to be taken every half hour.

Two, A.M. (three hours from last visit.)—All the symptoms relieved: no sickness, only two more motions of the same appearance; cramps gone from hands and arms, and less in the trunk—still in the legs; hands less cold, does not now feel chilly; began to feel warmer along the back after the second dose, *i. e.* little more than half an hour after commencing the medicine, though the previous efforts of his attendants with hot flannels, bags of hot bran, &c. had not produced the slightest effect, and were laid aside by me on my first arrival.

15th, eleven, A.M.—All the symptoms relieved: pulse full, soft, 76; still rather thirsty, and skin warmer than natural, and dry; tongue clean, rather whitish; has had refreshing sleep within the last hour—none before; feels only weak, no cramps, but pain in muscles on motion; only three motions like the former during the last nine hours, amounting to about two pints; none for the last three or four hours; no urine; slight nausea after the last dose of the medicine—let him take only half a table-spoonful every two hours, and five grains of calomel immediately.

Six, P.M. One yellow, fœtid, feculent motion, and nearly a quarter of a pint of natural urine.

Eleven, P.M. Has had some sound sleep, feels comfortable, but weak; and muscles feel tired, and rather painful after the cramps.

16th, mid-day. Feels well, but weak; pulse 84, full, and soft; skin still warmer than natural. Ordered to continue the mixture every four hours, with half a grain of sulphate of quinine each time. The recovery progressed rapidly.

Having alluded to the very slight cases, I may subjoin one. Called at 10, P.M. to a lady. She had been attacked in

the morning with a shivering, slight nausea, and diarrhœa; about six watery motions (rice-water and white sediment), unaccompanied by griping, no cramps, but some pain in calves of legs; the shivering continued, and she took a hot bath without any relief; she then went to bed, and could not get warm until after drinking a great many cups of mixed tea (a sedative), when profuse perspiration came on, with relief, in which state she was at my visit. There had been a dry heat before the perspiration, but even then a tendency to shivering; and she remarked, that upon stretching out the hand, or even turning the head round, there was a sense of shivering produced (morbid sensibility, independent of temperature). I recommended her merely to drink some more cool tea if thirsty; and, in case of any return of the diarrhœa the following morning, to take a dessert-spoonful of the saline antimonial every half hour. It did return, with nausea, and the second dose removed it entirely.

Having now stated what is essential as to the practical treatment of the disease, I may add a few observations on the theory, which will, I trust, prove interesting to the profession; premising, for the information of those who have not read the "First Principles of Medicine," that in the term sedative I include those remedies which have been usually denominated antiphlogistic, and which have been employed to counteract fevers and inflammations, such as saline medicines of various kinds, preparations of antimony, zinc, and mercury, vegetable emetics and astringents, &c.

Upon the analogy between Cholera and Ague I would address a few words to men of practical experience. What is called "the fever," so well known in India, beginning with chills and shivering (rigors), &c., followed by intense heat, (after which, in favourable cases, there is perspiration, with relief of symptoms), pursues occasionally a different course; for, as we also see here in common ague, the sweat does not come on, but the skin remains hot, in a state of continued or remittent fever. Who that has seen much of the Cholera does not recollect some cases with this routine? Again, "the

fever" of India, when it goes through the ague stages, does not, like our agues, continue for weeks; a second, or at most a third paroxysm, is usually fatal in the severe cases which the physician cannot check. Who has not seen patients die in Cholera after they had become quite hot, that fever-heat exciting fallacious hopes? There is an epidemic, the "Bombay fever," on record, which is said to have destroyed the patients in the cold stage; and it was inferred that, had the patient lived, the hot stage would have come on. Who will decide now whether that was cholera or ague, or which is which? for, though called fever, the description agrees with cholera. Whoever has had much experience in ague has seen all the modifications of Cholera; the cold stage, with convulsions (spasms)—spasmodic cholera; ague, with nausea and diarrhœa, and of course little or no urine—the purging cholera; ague with livid blueness of the skin, and shrivelled fingers, like a drowned person—blue cholera; ague, passing into continued fever—a common termination of cholera; &c. &c.

One of the most successful modes of treating ague is to give an emetic in the cold stage, followed up of course in the intervals by bark, or other tonics, with calomel, purgatives, &c. *pro re natâ*. I have frequently shewn my clinical pupils that bleeding in the cold stage is perfectly safe, and analogous to an emetic as to efficacy; but as it is not often quite necessary, and there is a feeling against it, I have not frequently resorted to it, as the emetic answers the purpose; but content myself with bleeding the patient, by leeches or otherwise, when requisite, between the paroxysms. It is pretty well known how valuable an adjunct bleeding has been considered in cases of Cholera; but the evidence is complicated, from the variety of treatment which has been adopted in conjunction with the bleeding, and I do not resort to it.

It would be quite beyond the limits and scope of this essay to enter further into the description of Cholera; but in Dr. James Johnson's Med. Chirur. Review, April 1832, will be found ample valuable information on the subject. At

p. 627 there is a note by the editor especially worthy of notice, shewing that the gruel or rice-water evacuations which constantly occur are not specific, but merely the result of all the bile and fæces which had been in the intestines being carried away; or, as he says, "ex nihilo nihil fit:" and I may add that, so far from a "discharge of bile completing cure," the discharge of bile is merely the ordinary event, evincing remission of the disease, or convalescence; and a renewed aguish paroxysm of Cholera would soon wash that away too. This clear-sighted and experienced physician also inculcates the use of sulphate of quinine, as I have done on principle.

In fine, I may repeat, that I consider Cholera an essentially febrile disease, whether it assume the intermittent, remittent, or continued form; that it is not a new disease, but the same described by Sydenham in 1669, and subsequently by Frank —the same which occurs in Madras, Bengal, Italy, Russia, England, and elsewhere; that when I, as above, use Sydenham's terms, "fresh type" and "new epidemic," I do so not as implying a new disease, but, as he does, a modified form of a disease according to the "constitution of the epidemic in the year in which it occurs;" just as he speaks of the great peculiarities assumed by the identical disease small-pox at different periods.

If severe cases of Asiatic Cholera be taken in time, they may be cured by acting upon the principle of relieving the internal congestion; unless, indeed, analogous to what takes place sometimes in continued fevers, the individual have received so powerful a dose of the epidemic poison as will certainly prove fatal, despite any mode of treatment. If the blood, however, has begun to coagulate, the patient is dead to all intents and purposes, even whilst breathing and speaking, and the heart acting; for I have heard the sounds of the valves of the heart just before death in Cholera, when I am satisfied clots were already formed in the ventricles: at this stage, of course, neither sedatives, stimulants, bleeding, nor any thing else, can produce any effect. The slight or middling cases of Cholera have a tendency, like ague, to remit of

themselves; hence, whatever treatment had been adopted, the practitioner used to think he had cured them: and thus I have been repeatedly told by practitioners that they had found the right thing to cure the Cholera. But the next time I met them, there was a diminution of confidence in the specific. Any person, however, who will treat the disease on principle, may defeat it by a variety of weapons, only using them with energy,—antimony, all sorts of salines, acetate of lead, sulphate of zinc, common salt and water, even cold water, calomel; but the last, if used in the quantity necessary to be sedative, afterwards produces havoc on the mouth. Stimulants in moderation do little harm, except the evil of augmenting the secondary fever; as the hot or febrile stage of many cases of Cholera would have been scarcely perceptible, if stimulants had not been used freely during the collapse, which might have been safely combated by the sedative constringents. The constant desire for cold water in Cholera is an example of natural instinct, which is thwarted by man in his wisdom, while every thing hot, both as to caloric and stimulants, is often poured into the patient. Considering, then, the constringent effect of the various sedatives, antimony, mercury, lead, neutral salts, alkalies, &c. &c., we can understand how, as they ultimately coincide in the indication of cure, they have been adopted by different persons to effect the same purpose; and each, finding some particular substance efficacious in certain cases, has subsequently used that in preference to others.

Previous to the visitation of Cholera in 1831, before I had an opportunity of personal observation, I was led (by reading letters from India, and books) to make a too-limited estimate of the other symptoms of Cholera, referring chiefly to the affection of the stomach and bowels (old English Cholera morbus) as the cause of the collapse. When, however, I encountered the enemy hand to hand, I saw at once that it was like ague, not merely as regards its epidemic and miasmatic origin, but almost, if not altogether, a remittent of a fresh type; and I often thought of what the great Sydenham candidly said of

his first encounters with new epidemics. I inculcated, therefore, a treatment in Cholera similar to that successfully adopted in Fever and Ague, which has been detailed above, and which was carried out with marked success by some of my medical friends in London, Paris, and elsewhere.

THE END.

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ON THE

MODE OF COMMUNICATION

OF

CHOLERA.

BY

JOHN SNOW, M.D.

LONDON:
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MDCCCXLIX.

ON THE

MODE OF COMMUNICATION

OF

CHOLERA.

It is not the intention of the writer to go over the much debated question of the contagion of cholera. An examination of the history of that malady, from its first appearance, or at least recognition, in India in 1817, has convinced him, in common with a great portion of the medical profession, that it is propagated by human intercourse. Its progress along the great channels of that intercourse, and the very numerous instances, both in this country and abroad, in which cholera dates its commencement in a town or village previously free from it to the arrival and illness of a person coming from a place in which the disease was prevalent, seem to leave no room for doubting its communicability.

It is quite true that a great deal of argument has

been employed on the opposite side, and that many eminent men hold an opposite opinion; but, besides the objection that negative evidence ought not to overthrow that of a positive kind, the instances that are believed to oppose the proofs of communication are reasoned upon in the opinion that cholera, if conveyed by human intercourse, must be contagious in the same way that the eruptive fevers are considered to be, viz., by emanations from the sick person into the surrounding air, which enter the system of others by being inhaled, and absorbed by the blood passing through the lungs. There is, however, no reason to conclude, *à priori*, that this must be the mode of communication of cholera; and it must be confessed that it is difficult to imagine that there can be such a difference in the predisposition to be affected or not by an inhaled poison, as would enable a great number to breathe it without injury in a pretty concentrated form (the immunity not having been earned by a previous attack, as in the case of measles, &c.), whilst others should be killed by it when millions of times diluted. The difficulties that beset this view are of the same kind, but not so great, as those which surround the hypothesis of a cholera poison generally diffused in the air, and not emanating from the sick.

Reasoning by analogy from what is known of other diseases, we ought not to conclude that cholera is propagated by an effluvium. In all known diseases in which the blood is poisoned in the first instance, gene-

ral symptoms, such as rigors, headache, and quickened pulse, precede the local symptoms; but it has always appeared, from what the writer could observe, that in cholera the alimentary canal is first affected, and that all the symptoms not referable to that part are consecutive, and apparently the result of the local affection. In those cases in which vertigo, lassitude, and depression precede the evacuations from the bowels, there is no reason to doubt that exudation of the watery part of the blood, which is soon copiously discharged, is already taking place from the mucous membrane; whilst in the cases in which the purging comes on more gradually, there is often so little feeling of illness that the patient cannot persuade himself that he has the cholera, or apply for remedies until the disease is far advanced,—this being a circumstance which increases the mortality. The quantity of fluid lost by purging and vomiting, taking into consideration the previous state of the patient, the suddenness of the attack, and the circumstance that the loss is not replaced by absorption, has seemed sufficient, in all the cases witnessed by the writer, to account, by the change it must occasion in the quantity and composition of the blood,* for the collapse, difficulty of breathing, and, in

* The valuable analyses of Dr. Garrod have recently fully confirmed what had been stated in the former visitation of Europe by the cholera, viz., that the solid contents of the blood of patients labouring under this disease are greatly increased in pro-

short, for all the symptoms, without assuming that the blood is poisoned, until it become so by the retention of matters which ought to pass off through the kidneys, the functions of which are, however, suspended by the thickened state of the blood, which will scarcely allow it to pass through the capillaries.

It is generally assumed that the blood becomes so altered by the cholera poison, that its watery and saline parts begin to exude by the mucous membrane of the alimentary canal; but it is more consonant with experience, both therapeutical and pathological, to attribute the exudation to some local irritant of the mucous membrane; no instance suggesting itself to the writer in which a poison in the blood causes irritation of, and exudation from, a single surface, as in cholera; for the sweating, as the patient approaches to collapse, is only what takes place in other cases from loss of blood, during fainting, and in any state in which the force of the circulation is greatly reduced.

Having rejected effluvia and the poisoning of the blood in the first instance, and being led to the conclusion that the disease is communicated by something that acts directly on the alimentary canal, the excretions of the sick at once suggest themselves as containing some material which, being accidentally swallowed, might attach itself to the mucous membrane of the

portion to the water—a state of the blood that is not met with in any other malady.

small intestines, and there multiply itself by the appropriation of surrounding matter, in virtue of molecular changes going on within it, or capable of going on, as soon as it is placed in congenial circumstances. Such a mode of communication of disease is not without precedent. The ova of the intestinal worms are undoubtedly introduced in this way. The affections they induce are amongst the most chronic, whilst cholera is one of the most acute; but duration does not of itself destroy all analogy amongst organic processes. The writer, however, does not wish to be misunderstood as making this comparison so closely as to imply that cholera depends on veritable animals, or even animalcules, but rather to appeal to that general tendency to the continuity of molecular changes, by which combustion, putrefaction, fermentation, and the various processes in organized beings, are kept up.

Whilst it is matter almost of certainty that intestinal worms are in this way communicated, it is never possible to trace the communication from one person to another: hence, if this be the mode of the propagation of cholera, there must often be great difficulty in detecting it. That a portion of the ejections or dejections must often be swallowed by healthy persons is, however, a matter of necessity. The latter even are voided with such suddenness and force that the clothes and bedding scarcely fail to become soiled, and being almost devoid of colour and odour, the presence of the evacuations is not always recognised; hence they

become attached unobserved to the hands of the person nursing the patient, and are unconsciously swallowed, unless care be taken to wash the hands before partaking of food: or if the person waiting on the sick have to prepare food for the rest of the family, as often happens, the material of communication here suggested has a wider field in which to operate; and where the patient, or those waiting on him, are occupied in the preparation or vending of provisions, the disease may be conveyed to a distance, and into quarters having apparently no communication with the sick.

All the observers who have recorded their opinions on the subject, agree in attributing a great influence to want of personal cleanliness in increasing the prevalence and fatality of cholera. Dr. Lichtenstädt, in a work on Cholera published in 1831, states, "that at Berditscher, in Volhynia, a place of a few thousand inhabitants, no less than 900 were attacked in thirty-one days. Amongst 764 of these were 658 Jews, and only 106 Christians, although the Jewish population is far from being proportionally so great; and among the Christians attacked the deaths were 61·3 per cent., while among the Jews they were 90·7 per cent. The only reason assigned by the reporter for these extraordinary differences is the excessive disregard of cleanliness among the Jewish inhabitants."* The first appearance of cholera in many of the towns of this country

* Edin. Med. and Surg. Journal, vol. xxxvii.

in 1832 was in the courts and alleys to which vagrants resort for a night's lodging, where it often lingered for some time before spreading to the more cleanly part of the people.

The views here explained open up to consideration a most important way in which the cholera may be widely disseminated, viz., by the emptying of sewers into the drinking water of the community; and, as far as the writer's inquiries have extended, he has found that in most towns in which the malady has prevailed to an unusual extent this means of its communication has existed. The joint town of Dumfries and Maxwell-town, not usually an unhealthy place, has been visited by the cholera both in 1832 and at the close of last year with extreme severity. On the last occasion the deaths were 317 in Dumfries, and 114 in Maxwell-town, being 431 in a population of 14,000. The inhabitants drink the water of the Nith, a river into which the sewers empty themselves, their contents floating afterwards to and fro with the tide. Glasgow, which has been visited so severely with the malady, is supplied, as I understand, with water from the Clyde, by means of an establishment situated a little way from the town, and higher up the stream, and the water is professed to be filtered; but as the Clyde is a tidal river in that part of its course, the contents of the sewers must be washed up the stream, and, whatever care may be taken to get the supply of water when the tide is down, it cannot be altogether free from contamination. In

the epidemic of seventeen years ago, the cholera was much more prevalent in the south and east districts of London, which are supplied with water from the Thames and the Lea, where these rivers are much contaminated by the sewers, than in the other parts of the metropolis differently supplied. And this is precisely what has occurred again, as will be shewn further on.

The opinions now made known have been entertained by the author since the latter part of last year, and were mentioned by him to several medical gentlemen in the winter,—amongst others, to Dr. Garrod and Dr. Parkes; but he hesitated to publish them, thinking the evidence in their favour of so scattered and general a nature as not to be likely to make a ready and easy impression. Within the last few days, however, some occurrences have come within his knowledge which seem to offer more direct proof, and have induced him to take the present course.

In Thomas Street, Horsleydown, there are two courts close together, consisting of a number of small houses or cottages, inhabited by poor people. The houses occupy one side of each court or alley—the south side of Trusscott's Court, and the north side of the other, which is called Surrey Buildings, being placed back to back, with an intervening space, divided into small back areas, in which are situated the privies of both the courts, communicating with the same drain, and there is an open sewer which passes the further end of both

courts. Now, in Surrey Buildings the cholera has committed fearful devastation, whilst in the adjoining court there has been but one fatal case, and another case that ended in recovery. In the former court the slops of dirty water poured down by the inhabitants into a channel in front of the houses got into the well from which they obtained their water, this being the only difference that Mr. Grant, the Assistant-Surveyor for the Commissioners of Sewers, could find between the circumstances of the two courts, as he stated in his report to the Commissioners. The well in question was supplied from the pipes of the South London Water Works, and was covered in on a level with the adjoining ground; and the inhabitants obtained the water by a pump placed over the well. The channel mentioned above commenced close by the pump. Owing to something being out of order, the water for some time past occasionally burst out at the top of the well, and overflowed into the gutter or channel, afterwards flowing back again mixed with the impurities; and crevices were left in the ground or pavement, allowing part of the contents of the gutter to flow at all times into the well, and when it was afterwards emptied a large quantity of black and highly offensive deposit was found in it.

The first case of cholera in this court occurred on July 20th, in a little girl, who had been labouring under diarrhœa for four days. This case ended favourably. On the 21st July, the next day, an elderly

female was attacked with the disease, and was in a state of collapse at ten o'clock the same night. This patient partially recovered, but died of some consecutive affection on August 1. Mr. Vinen, of Tooley Street, who attended these cases, states that the evacuations were passed into the beds, and that the water in which the foul linen would be washed would inevitably be emptied into the channel mentioned above. Mr. Russell, of Thornton Street, Horsleydown, who attended many of the subsequent cases in the court, and who, along with another medical gentleman, was the first to call the attention of the authorities to the state of the well, says that such water was invariably emptied there, and the people admit the circumstance. About a week after the above two cases commenced, a number of patients were taken ill nearly together: four on Saturday, July 28th, seven or eight on the 29th, and several on the day following. The deaths in the cases that were fatal took place as follows:—One on the 29th, four on the 30th, and one on the 31st July; two on August 1st, and one on-August the 2d, 5th, and 10th respectively, making eleven in all. They occurred in seven out of the fourteen small houses situated in the court.

The two first cases on the 20th and 21st may be considered to represent about the average amount of cases for the neighbourhood, there having been just that number in the adjoining court, about the same time. But in a few days, when the dejections of these

patients must have become mixed with the water the people drank, a number of additional cases commenced nearly together. The patients were all women and children, the men living in the court not having been attacked; but there has been no opportunity hitherto of examining into the cause of exemption, as the surviving inhabitants had nearly all left the place when the writer's attention was called to this circumstance.

In Albion Terrace, Wandsworth Road, there has been an extraordinary mortality from cholera, which was the more striking, as there were no other cases at the time in the immediate neighbourhood; the houses opposite to, behind, and in the same line, at each end of those in which the disease prevailed, having been free from it. The row of houses in which the cholera prevailed to an extent probably altogether unprecedented in this country, constituted the genteel suburban dwellings of a number of professional and tradespeople, and are most of them detached a few feet from each other. They are supplied with water on the same plan. In this instance the water got contaminated by the contents of the house-drains and cesspools; the cholera extended to nearly all the houses in which the water was thus tainted, and to no others.

These houses are numbered from 1 to 17 in Albion Terrace, and are supplied with water from a copious spring in the road in front of the terrace, the water of which is conducted by a brick barrel drain between

Nos. 7 and 8, to the back of the houses, and then flows right and left to supply tanks in the ground behind each house, the tanks being made of brickwork and cement, covered with a flat stone, and connected with each other by stoneware pipes six inches in diameter. A leaden pipe conveyed water from each tank to a pump situated in the back-kitchen. There is a cesspool behind each house, under the privy, and situated four feet from the water-tank. The ground was opened, and the drains examined under the superintendence of Mr. Grant, the Assistant-Surveyor, behind the houses No. 1 and No. 7. The cesspools at both these places were quite full, and the overflow-drain from that at No. 1 choked up. At this house the respective level of the cesspool and the water-tank were measured, and the top of the overflow-drain from the cesspool was found to be fifteen inches above the top of the tank, and the intervening ground was very wet. The overflow-drain mentioned above had no bottom, or one so soft that it could be penetrated with a stick; and it crossed at right angles above the earthenware pipe of the water-tank, the joints of which were leaky, and allowed the water to escape. Behind No. 7, Mr. Grant found a pipe for bringing surplus water from the tanks, communicating with a drain from the cesspool; and he found a flat brick drain laid over the barrel drain before mentioned, which brings the water from the spring. It appears, from a plan of the property, that this drain, which is continued in a direction

towards the sewer in Battersea Fields, brings surface-drainage from the road, and receives the drains from the cesspools, the house-drains from the sinks in the back kitchens, and the surplus water, or some of it, from the tanks. There is every reason to believe that this drain is stopped up, but that has not yet been ascertained; at all events, it was unable to convey the water flowing into it during the storm on July 26th, as it burst near the house No. 8, and inundated the lower premises of that and the adjoining house, No. 9, with fœtid water; and it was from this time that the water, which had occasionally been complained of before, was found by most of the people in these seventeen houses to be more or less impure or disagreeable. The water broke out of the drain again at No. 8, and overflowed the kitchens, during a heavy rain on August 2d. It should be particularly remarked, that the tanks are placed on the same level, so that pumping from one will draw water from the others, and that any impurity getting into one tank would consequently be imparted to the rest.

The first case of cholera occurred at No. 13, on July 28th (two days after the bursting of the drain), in a lady who had had premonitory symptoms for three or four days. It was fatal in fourteen hours. There was an accumulation of rubbish in the cellar of this house, which was said to be offensive by the person who removed it; but the proprietor of the house denied this. A lady at No. 8 was attacked with cho-

leraic diarrhœa on July 30th: she recovered. On August 1st, a lady, aged 81, at No. 6, who had had some diarrhœa eight or ten days before, which had yielded to her own treatment, was attacked with cholera; she died on the 4th with congested brain. Diarrhœa commenced on August 1st, in a lady, aged 60, at No. 3; collapse took place on the 5th, and death on the 6th. On August 3d, there were three or four cases in different parts of the row of houses, and two of them terminated fatally on the same day. The attacks were numerous during the following three or four days, and after that time they diminished in number. More than half the inhabitants of the part of the terrace in which the cholera prevailed were attacked with it, and upwards of half the cases were fatal. The deaths occurred as follows; but as some of the patients lingered a few days, and died in the consecutive fever, the deaths are less closely grouped than the seizures. There was one death on July 28th, two on August 3d, four on the 4th, two on the 6th, two on the 7th, four on the 8th, three on the 9th, one on the 11th, and one on the 13th. These make twenty fatal cases; and there were four or five deaths besides amongst those who were attacked after flying from the place.

The fatal cases were distributed over ten out of the seventeen houses, and Mr. Mimpriss, of Wandsworth Road, who attended many of the cases, and to whose kindness the writer is indebted for several of these particulars, states that cases occurred in the other seven

houses, with the exception of one or two that were empty, or nearly so. There were five deaths in the house No. 6, and one of a gentleman the day after he left it, and went to Hampstead Heath. The entire household, consisting of seven individuals, had the cholera, and six of them died.

There are no data for showing how the disease was probably communicated to the first patient, at No. 13, on July 28th; but it was two or three days afterwards, when the evacuations from this patient must have entered the drains, having a communication with the water supplied to all the houses, that other persons were attacked, and in two days more the disease prevailed to an alarming extent.

The water was found to be polluted by the contents of the drains and cesspools to a great extent. That removed by Mr. Grant from the tank behind No. 1, had, when first taken out, an odour distinctly stercoraceous. It is less offensive now, at the end of twelve days, than when it was removed. It does not become clear on standing, owing to a kind of fermentation going on in it, which prevents the mud from entirely settling to the bottom of the vessel. After being filtered through paper, it is quite clear, but retains a slightly disagreeable taste, and froths on being agitated. On evaporating 1000 grains to dryness, there is a residue of nearly two grains over and above the residue of salts obtained by evaporating water obtained from a pump which is supplied from the same spring. This

excess consists, there is no doubt, of soluble organic matters, the exact nature of which has not been determined. In the water-tank behind No. 7, there was a dark-coloured offensive deposit, six to nine inches deep, although the depth of the tank was only two feet. There was also a scum on the surface of the water. Some of the deposit, which was removed, has been undergoing putrefactive fermentation, and giving off sulphuretted hydrogen, ever since, having a tendency to expel the cork from the bottle in which it is kept. It possesses the odour of privy-soil very distinctly. Various substances have been found in it which escape digestion, as the stones and husks of currants and grapes, and portions of the thin epidermis of other fruits and vegetables. Little bits of paper were likewise found. Some of the water removed from this tank continued to ferment till a day or two ago, but is now quite clear and transparent; and although there are some portions of the fibrous structures of vegetables lying at the bottom of the bottle in which it is contained, the water itself has neither taste nor smell, and cannot, by either physical or chemical examination, be distinguished from that of the spring whence it originally proceeded. This circumstance shews, in a remarkable manner, the power of spontaneous putrefaction to free water from all impurities of an animal or a vegetable nature.

Many of the patients attributed their illness to the water: this is here mentioned as shewing that they had

drank of it, and at the same time found that it was impure. As explaining how persons might drink of such water before finding out its impurity, it may be stated that the grosser part of the material from drains and cesspools has a tendency, when mixed with water, to settle rapidly to the bottom. The only houses supplied with the same water, after passing the tanks in Albion Terrace, were four in Albion Street; but three of these have been empty for months, and the fourth is inhabited by a gentleman who always suspected the water, and would not drink it. There were two or three persons attacked with cholera amongst those who came to nurse the patients after the water was condemned, and who, consequently, did not drink it; but these persons were liable, in waiting on the patient, to get a small portion of the evacuations into the stomach in the way first pointed out; and there might be food in the houses previously prepared with the tainted water. It is not here implied that all the cases in Albion Terrace were communicated by the water, but that far the greater portion of them were; that, in short, it was the circumstance of the cholera evacuations getting into the water which caused the disease to spread so much beyond its ordinary extent.

The mortality in Albion Terrace is attributed by Dr. Milroy, in a published report to the General Board of Health, chiefly to three causes: firstly, to an open sewer in Battersea Fields, which is 400 feet to the

north of the terrace, and from which the inhabitants perceived a disagreeable odour when the wind was in certain directions; secondly, to a disagreeable odour from the sinks in the back kitchens of the houses, which was worse after the storm of July 26; and lastly, to the accumulation in the house No. 13 before alluded to. With respect to the open sewer, there are several streets and lines of houses as much exposed to any emanations there might be from it, as those in which the cholera prevailed, and yet they were quite free from the malady, as were also nineteen houses situated between the sewer and Albion Terrace. As regards the bad smells from the sinks in the kitchen, their existence is of such every-day, and almost universal prevalence, that they do not help to explain an irruption of cholera, like that under consideration; indeed, offensive odours were created in thousands of houses, in London, by the same storm of rain on July 26th; and the two houses in which the offensive smell was greatest, viz. Nos. 8 and 9,—those which were flooded with the contents of the drain,—were less severely visited with cholera than the rest; the inhabitants having only had diarrhœa or mild attacks of cholera. The accumulation in the house No. 13 could not affect the houses at a distance from it. It remains evident, then, that the only special and peculiar cause connected with the great calamity which befel the inhabitants of these houses, was the state of the water, which was followed

by the cholera in almost every house to which it extended, whilst all the surrounding houses were quite free from it.

Although there are a great number of pumps, supplied by wells, in this metropolis, yet by far the greater part of the water used for drinking and for culinary purposes is furnished by the various Water Companies. On the south side of the Thames the water works all obtain their supply from that river, at parts where it is much polluted by the sewers; none of them obtaining their water higher up the stream than Vauxhall Bridge,—the position of the South London Water Works. Now as soon as the cholera began to prevail in London, part of the water which had been contained in the evacuations of the patients would begin to enter the mains of the Water Works: whether the materies morbi of cholera,—which, it has been shewn, there is good reason for believing is contained in the evacuations,—would be sent round to the inhabitants, would depend on whether the water were kept in the reservoirs till this materies morbi settled down or was destroyed; or whether it could be separated by the filtration through gravel and sand, which the water is stated to undergo. Notwithstanding this filtration, the water in this part of town is not always quite clear, and sometimes it has an offensive smell when clear. The deaths from cholera in this district, which contains a very little more than a quarter of the population, have been more numerous

than in all the other districts put together; as will be seen by the following table, taken from the reports of the Registrar-General. Out of the 7466 deaths in the metropolis, 4001 have occurred on the south side of the Thames, being nearly eight to each thousand of the inhabitants.

Deaths from Cholera in London, registered from September 23d, 1848, to August 25th, 1849.

Districts of London.	Population in 1841.	Deaths from Cholera.	Deaths to each 1,000 inhabitants.
West . .	300,711	533	1·77
North . .	375,971	415	1·10
Central . .	373,605	920	2·48
East . . .	392,444	1,597	4·06
South . .	502,548	4,001	7·95
Total . .	1,948,369	7,466	3·83

That division of London called the East District in the registration reports, is supplied with water entirely by the East London Water Company. In the cholera of 1832 and 1833 the reservoirs of the company at Old Ford were entirely filled from the river Lea when the water flowed up with the rising tide from the

Thames, in the neighbourhood of Blackwall; and the river Lea itself receives some large sewers. The Company have since obtained water from near Lea Bridge, above the reach of the tide; but whether they still supply themselves in part from the river at Old Ford, where their chief works and reservoirs are still situated, and if so, to what parts of their district the water so obtained is sent, cannot be here stated, for want of exact information.

The cholera has prevailed to a considerable extent in the East districts, as will be seen by the Table, though not so much as on the south of the Thames.

The North districts have suffered very little from cholera as yet. St. Pancras and Islington, which comprise a great portion of this division, are supplied with the New River water, which is brought from Hertfordshire. Hackney is supplied by the East London Water Works; Hampstead by sources of its own; and Marylebone, which will again be alluded to, chiefly by the West Middlesex Water Works.

The whole of the Central Districts are likewise supplied from the New River, and this part of the town has suffered much less from cholera, hitherto, than the south and east divisions; although many portions of it are quite on a par with the worst parts on the south of the Thames as regards overcrowding and bad smells.

The West Districts, together with Marylebone, are supplied with Thames water by the West Middlesex,

Grand Junction, and Chelsea Water Works. The West Middlesex Company obtain their water above Hammersmith, and the Grand Junction at Brentford; both these places, and especially the latter, are, by the meandering course of the river, several miles above London; and unless, perhaps, at certain parts of the tide, are free from sewage water, except that of certain towns,—as Richmond, Barnes, &c.—in which the cholera has not yet been prevalent. The Chelsea Company, which supply Chelsea, Pimlico, Westminster, and part of Brompton, get their water at Chelsea, only one or two miles above Vauxhall; but they take great pains to filter it carefully. It will perhaps be remarked that the dilution of the cholera poison in the Thames would most likely render it innocuous; but as far as can be judged from analogy, the poison consists probably of organized particles, extremely small no doubt, but not capable of indefinite division, so long as they retain their properties.

It will probably be objected to the views advanced in this paper, that animal poisons, when swallowed, are generally destroyed in the stomach by the process of digestion; and, indeed, it is not improbable that the material which gives rise to cholera is often thus destroyed, and its effects resisted, since the complaint is very often observed to come on when the digestive powers have been weakened by a fit of drunkenness.

It should be observed, that the mode of contracting the malady here indicated does not altogether preclude

the possibility of its being transmitted a short distance through the air; for the organic part of the fæces, when dry, might be wafted as a fine dust, in the same way as the spores of cryptogamic plants, or the germs of animalcules, and entering the mouth, might be swallowed. In this manner, open sewers, as their contents are continually becoming dry on the sides, might be a means of conveying the cholera, independently of their mixing with water used for drinking. Mr. Russell, of Horsleydown, who attended the two first cases of the disease occurring in London last autumn—that of John Harnold, a seaman just arrived from Hamburgh, where the disease was prevailing, and that of a man named Blenkinsopp, who came, after the death of the former, to lodge and sleep in the same room, and had the cholera eight days after him*—states, that the

* Some serious mistakes respecting these cases have crept into the documents furnished to Dr. Parkes by the General Board of Health, as subject matter for his inquiry into the bearing of the earliest cases of cholera on the question of contagion; as will be evident from a comparison of the following quotations from Dr. Parkes's paper, with the accompanying statement of the real circumstances:—

"The Elbe steamer left Hamburgh on the 22d September, and arrived in the river on the 25th. A seaman, named John Harnold, left the vessel, and went to live at No. 8, New Lane, Gainsford Street, Horsleydown. On the 28th of September he was seized with symptoms of cholera, and died in a few hours. It is stated in a letter to the General Board of Health, from Mr. Russell, who attended the patient, that all the characteristic symptoms of

next cases in Horsleydown, which commenced three or four days afterwards, were in a situation a little way removed from that of the two preceding, and having no apparent connection with it, except that an open sewer, up which the tide flows, runs past both places, and the sewage from the houses in the first neighbourhood is, when the tide rises, carried past those in the second.

cholera were present. Mr. Bowie, who inquired on behalf of the Board into the particulars of the case, corroborated this statement. This may, then, be considered as an undoubted case of cholera."

"If the disease was imported thus from Hamburgh, it did not spread in Horsleydown. Two days subsequently, indeed, Mr. Russell was sent for to a patient in the same house, who fancied he had cholera; but, on examining into particulars, it turned out that the individual in question had been greatly alarmed at the death of the seaman, and was suffering more from the effects of fear than anything else. He was quite well in a few hours. No other person was taken ill in the house or immediate neighbourhood, although, if the second case had not been inquired into, a vague story of communicated disease might have arisen in the neighbourhood."

Now, the illness and death of John Harnold took place on the 22nd of September, and not on the 28th, and Mr. Russell attended the next case in the same *room* on September 30th. There were, in this latter case, rice-water evacuations, and, amongst other decided symptoms of cholera, complete suppression of urine from Saturday to Tuesday morning, and the patient vomited incessantly for twenty-four hours after this, and afterwards had consecutive fever. Mr. Russell had seen a great deal of cholera in 1832, and had no doubt of this being a genuine case; and he

These opinions respecting the cause of cholera are brought forward, not as matters of certainty, but as containing a greater amount of probability in their favour than any other, in the present state of our knowledge. Nearly all medical men admit a cholera poison, whatever their opinions may be with respect to contagion; and many of them even speak of the purging as an effort of nature to get rid of the poison: they cannot, then, in either case, suppose that the evacuations are free from it, or that, being swallowed, the stomach should always have the power of destroying it, and preventing its producing its peculiar effects; therefore the views here stated seem to have a fair claim to the consideration of the profession. At all events, the mode of communication of cholera is a question of the most vital importance with respect to its prevention. Who can doubt that the case of John Harnold, the seaman from Hamburgh, mentioned above, was the true cause of the malady in Blenkinsopp, who came, and lodged, and slept, in the only room in all London in which there had been a case of

has seen a great deal of the disease lately, and still continues of the same conviction.

The mistake in the date alone at which the first case occurred, alters the bearing of all the facts submitted to Dr. Parkes, even should the particulars of all the other cases be correct. The writer accidentally detected the errors pointed out in this note by having to call on Mr. Russell in his inquiries respecting Surrey Buildings.

true Asiatic cholera for a number of years? And if cholera be communicated in some instances, is there not the strongest probability that it is so in the others —in short, that similar effects depend on similar causes?

The belief in the communication of cholera is a much less dreary one than the reverse; for what is so dismal as the idea of some invisible agent pervading the atmosphere, and spreading over the world? If the writer's opinions be correct, cholera might be checked and kept at bay by simple measures that would not interfere with social or commercial intercourse; and the enemy would be shorn of his chief terrors. It would only be necessary for all persons attending or waiting on the patient to wash their hands carefully and frequently, never omitting to do so before touching food, and for everybody to avoid drinking, or using for culinary purposes, water into which drains and sewers empty themselves; or, if that cannot be accomplished, to have the water filtered and well boiled before it is used. The sanitary measure most required in the metropolis is a supply of water for the south and east districts of it from some source quite removed from the sewers.

It would have been more satisfactory to the author to have given the subject a much more extensive examination, and only to have published his opinions in case he could bring forward such a mass of evidence

in their support as would have commanded ready and almost universal assent; but being preoccupied with another subject, he could only either leave the inquiry, or bring it forward in its present state, and he has considered it to be his duty to adopt the latter course, and allow his professional brethren to decide what there may be of value in his opinions; and he will be happy to receive any information bearing on the points discussed in his paper.

Frith Street, Soho,
Aug. 29, 1849.

THE END.

WILSON AND OGILVY, 57, SKINNER STREET, LONDON.

TABLE I.

REPRESENTS a FRONT VIEW of the MALE SKELETON, with some of the CARTILAGES and LIGAMENTS which connect the BONES to each other.

HEAD *and* NECK.

A, THE frontal bone.
B, The parietal bone.
C, Temporal process of the sphenoid bone.
D, Squamous part of the temporal bone.
E, Mastoid process of that bone.
F, The malar, or cheek-bone.
G, The nasal bone, behind which is the nasal process of,
H, The superior maxillary bone.
I, The lower jaw.
K, The cervical vertebræ, with their intermediate cartilages and transverse processes

TRUNK.

A, The sternum.
B, The seventh, or last true rib.
C, The cartilages of the ribs.
D, The twelfth, or last false rib.
E, The lumbar vertebræ, with their intervertebral cartilages and transverse processes.
F, The os sacrum.
G, The os innominatum, composed of,
a, The os ilium,
b, The os pubis,
c, The os ischium.

TABLE I. CONTINUED.

Upper Extremity.

A, The clavicle.
B, Inner surface of the scapula.
a, The acromion of the scapula.
b, The coracoid process of that bone.
C, The os humeri.
c, The head, or ball of the os humeri, articulated with the glenoid cavity of the scapula.
d, Internal tubercle of the os humeri, and farther out, the groove for lodging the tendon of the long head of the biceps muscle.
e, The inner, and,
f, The outer condyle of the os humeri. Between *e* and *f*, the hollow for lodging the coronoid process of the ulna in the flexion of the fore-arm.
D, The radius.
g, The head of the radius.
E, The ulna.
h, The coronoid process of the ulna.
F, The bones of the carpus.
G, The metacarpal bone of the thumb.
H, The metacarpal bones of the fingers.
I, The two bones of the thumb.
K, The three phalanges of the fingers.

Under Extremity.

A, The os femoris.
d, The ball, or head of this bone, lodged in the acetabulum.
e, The cervix of the bone.

f, The large trochanter.
g, The small trochanter.
h, The inner condyle.
i, The outer condyle.
B, The patella, placed upon the trochlea of the os femoris.
C, The tibia.
k, The head of the tibia, between which and the condyles of the os femoris, the semilunar cartilages appear.
l, The tubercle of the tibia.
m, The malleolus internus.
D, The fibula, the upper end of which is connected with the tibia.
n, The malleolus externus.
E, The bones of the tarsus.
o, The projection of the os calcis.
F, The metatarsal bones.
G, The phalanges of the toes.

TABLE II.

Represents a Back View of the Male Skeleton, with some of the Cartilages and Ligaments which connect the Bones to each other.

Head and Trunk.

A, The parietal bone.
a, The sagittal suture, and parietal hole.
B, The occipital bone.
b, *b*, The lambdoid suture.
C, The joining of the temporal and parietal bones.
D, The cheek-bone.
E, F, The inner or back part of the jaws, with the teeth.
G, The first cervical vertebra.
H, The second cervical vertebra.
I, The seventh cervical vertebra.
c, The spinous processes of the cervical vertebræ.
K, The first dorsal vertebra.
L, The twelfth dorsal vertebra.
d, The spinous processes of the dorsal vertebræ.
e, Their transverse processes.
M, The first lumbar vertebra.
N, The fifth lumbar vertebra.
f, Their spinous, and,
g, Their transverse processes.

Tab II.

TABLE II. CONTINUED.

O, The os sacrum.

h, The uppermost spinous process. Farther out are seen the superior oblique processes of this bone, joined to the inferior oblique of the last lumbar vertebra.

i, *i*, The lateral parts of the os sacrum, joined to the ossa innominata. Between *i* and O, the posterior foramina of the os sacrum.

k, An opening in the under and back part of this bone, covered in the subject by a ligamentous membrane.

P, The os coccygis, joined by its shoulders to the os sacrum at the lower part of the opening *k*.

Q, The os ilium.

R, The os pubis.

S, The os ischium.

T, U, The seven true ribs.

V, V, The five false ribs.

Superior Extremity.

A, The clavicle.

B, The dorsum scapulæ.

a, The spine of the scapula.

b, The acromion of the scapula.

c, A fossa for lodging the supra-spinatus muscle.

d, An irregular surface, occupied by the infra-spinatus muscle.

C, The os humeri.

e, The ball of the os humeri.

f, The external tubercle of the bone.

g, The external condyle.

h, The internal condyle.

i, Cavity for lodging the olecranon of the ulna.

D, The radius.
k, The head of the radius, articulated with the trochlea of the os humeri.
l, The under end of the radius, grooved by the tendons of muscles.
E, The ulna.
m, The olecranon of the ulna.
n, The under end of the ulna, with its styloid process.
F, The bones of the carpus.
G, The metacarpal bone of the thumb.
H, The metacarpal bones of the fingers.
I, The two bones of the thumb.
K, The three phalanges of the fingers.

INFERIOR EXTREMITY.

A, The os femoris.
a, Part of the ball of the os femoris.
b, The cervix of the bone.
c, The trochanter major.
d, The trochanter minor.
e, The cavity for lodging the popliteal vessels and nerves.
f, The external condyle.
g, The internal condyle.
h, The semilunar cartilages.
B, The tibia.
i, The head of the tibia.
k, The malleolus internus.
C, The fibula.
l, The head of the fibula.
m, The malleolus externus.

D, The bones of the tarsus.
n, The astragalus.
o, The os calcis.
p, The fore-part of the tarsus.
E, The bones of the metatarsus.
F, The phalanges of the toes.

TABLE III.

VIEWS of the different BONES of the CRANIUM.

FIG. 1.

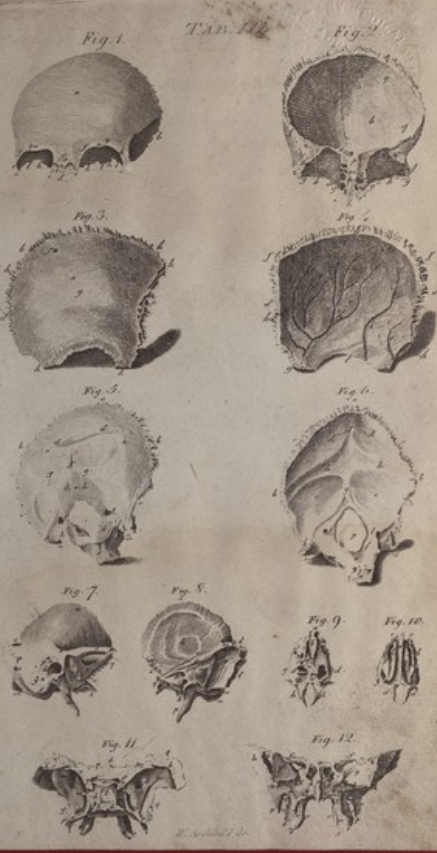
The Outer Surface of the FRONTAL BONE.

a, The middle and convex part of the bone.
b, Part of the temporal fossa.
c, *c*, *c*, *c*, The angular processes.
d, The nasal process.
e, Eminences and cavities to which the nasal and maxillary bones are fixed.
f, *f*, The superciliary arches.
g, *g*, The supereiliary holes.
h, *h*, The orbitar plates.
i, *i*, The lacrymal fossæ.
k, *k*, The internal orbitar foramina.
l, *l*, Inequalities which unite this bone to the os sphenoides.

FIG. 2.

The Inner Surface of the FRONTAL BONE.

a, The concave part of the bone.
b, The cavity which lodges the anterior lobes of the brain.
c, The frontal spine.
d, The furrow where the falx is fixed, and the superior longitudinal sinus is lodged.
e, The ragged edge of the bone, which assists in forming the coronal suture.
f, *f*, Other inequalities, which join the frontal to the sphenoid bone.
g, *g*, *g*, *g*, Inner surface of the angular processes.
h, The posterior surface of the nasal process.
i, *i*, Other inequalities, near the nasal process.



k, *k*, The orbitar plates.

l, *l*, The lacrymal fossæ.

m, *m*, Cells which correspond with those of the ethmoid bone.

n, *n*, The passages from the frontal sinuses.

o, The foramen cæcum.

p, The opening which receives the cribriform plate of the ethmoid bone.

q, *q*, Furrows which lodge the blood-vessels of the dura mater.

FIG. 3.

External Surface of the Right PARIETAL BONE.

a, The middle convex part of the bone.

b, *b*, The upper ragged edge of the bone, which, when joined to its fellow, forms the sagittal suture.

c, The anterior edge, which assists in forming the coronal suture.

d, The posterior edge, which joins the occipital bone, and forms the lambdoid suture.

e, The inferior semilunar edge, which joins the squamous part of the temporal bone.

f, The parietal hole.

g, An arched ridge, which gives origin to a large share of the temporal muscle.

h, *h*, *h*, *h*, The angles of the bone.

FIG. 4.

Internal Surface of the same PARIETAL BONE.

a, The middle concave part.

b, The inner surface of the upper edge of the bone, where the indentations are more apparent than those of the outer side.

c, The parietal hole.
d, The anterior serrated edge of the bone.
e, The posterior edge, more indented than the anterior one.
f, *f*, The superior angles.
g, *g*, The inferior anterior angle, where the beginning of the furrow is seen, which lodges the trunk of the principal artery of the dura mater.
h, *h*, The ramifications of that furrow.
i, *i*, The small furrows which lodge other arteries of the dura mater.
k, A depression which lodges part of the lateral sinus.
l, The inferior edge of the bone, considerably thinner than the rest.

FIG. 5.

View of the External Surface of the OCCIPITAL BONE.

a, The superior angle of the bone.
b, *b*, The ragged edge, which assists in forming the lambdoid suture.
c, *c*, The irregularities at the lateral and inferior parts of the bone, where it is joined to the ossa temporum.
d, *d*, The large transverse arched ridge, or spine.
e, *e*, The muscular prints upon the transverse ridge.
f, The perpendicular spine.
g, The smaller arched ridge, crossing the perpendicular spine.
h, *h*, The muscular prints above.
i, The foramen magnum.
k, *k*, The occipital condyles.
l, *l*, The posterior condyloid foramina.

m, *m*, The inner side of the left, and outer side of the right anterior condyloid foramen.
n, *n*, The nitches which assist in forming the holes common to the occipital and temporal bones.
o, The cuneiform process, marked by the attachment of muscles.

FIG. 6.

Internal Surface of the OCCIPITAL BONE.

a, The superior angle of the bone.
b, *b*, The middle or lateral angles.
c, *c*, The eminences and cavities which assist in forming the lambdoid suture.
d, *d*, The superior occipital fossæ, which lodge a share of the posterior lobes of the brain.
e, *e*, The inferior occipital fossæ, which contain part of the cerebellum.
f, *f*, The upper limb of the perpendicular spine, which receives the superior longitudinal sinus, and has the falx fixed to it.
g, The lower limb of that spine, to which the falx minor is fixed.
h, *h*, The fossæ, which contain the lateral sinuses, and have the tentorium fixed to their edges.
i, *i*, The openings which form part of the foramina lacera, common to this bone and the os temporis.
k, *k*, The small processes which assist in forming the foramina lacera.
l, *l*, The posterior condyloid holes.
m, The anterior condyloid hole of the right side.
n, The concave surface of the cuneiform process.

o, The inequalities of the cuneiform process, by which it is united with the sphenoid bone.
p, The foramen magnum.

FIG. 7.

The Outer Surface of the TEMPORAL BONE *of the Right Side.*

a, The upper and squamous part of the bone.
b, The under part, which lodges a portion of the temporal muscle.
c, That part of the bone which assists in forming the additamentum of the squamous suture.
d, The zygomatic process.
e, The transverse, or articular process.
f, The mastoid process.
g, The small holes, for transmitting vessels to the bone, or to the dura mater.
h, The meatus auditorius externus, surrounded by a rough margin.
i, The glenoid, or articular cavity.
k, The glenoid fissure, for the attachment of part of the articular ligament.
l, The vaginal process.
m, Part of the mastoid groove.
n, The styloid process.
o, The foramen mastoideum.
p, The base, or upper part of the mastoid process.
q, The inferior and anterior part of the bone, which joins the os sphenoides.
r, A small portion of the Eustachian tube.
s, The point of the pars petrosa.

FIG. 8.

The Inner Surface of the TEMPORAL BONE.

a, The upper edge of the squamous process.
b, The middle of that process, marked by the convolutions of the brain.
c, A part of the bone which joins the os sphenoides.
d, The nitch which receives the under and back part of the parietal bone.
e, The upper part of the pars petrosa.
f, A groove which lodges the superior petrosal sinus.
g, The fossa which lodges part of the lateral sinus.
h, The meatus auditorius internus.
i, The nitch which assists in forming the foramen lacerum.
k, Part of the fossa which lodges the beginning of the internal jugular vein.
l, The posterior part of the bone which joins the os occipitis.
m, The foramen mastoideum.
n, A portion of the mastoid process.
o, The mastoid groove.
p, The styloid process.
q, The inner extremity of the pars petrosa divided into two portions.

FIG. 9.

The Upper and Inner Surface of the ETHMOID BONE.

a, The anterior extremity of the bone, terminating in a small flat process.
b, The crista Galli.
c, *c*, The cribriform plate, for the passage of the olfactory nerves.
d, *d*, The posterior ethmoid cells.

e, The back part of the nasal plate, which forms part of the septum narium.
f, *f*, The posterior margin of the bone.
g, The os planum of the left side.
h, *h*, The sphenoid cornua, or triangular bones, which join the body of the sphenoid bone; their fore parts being fixed to the ethmoid one.

FIG. 10.

The Under and Outer Surface of the ETHMOID BONE.

a, The nasal plate, which forms the upper part of the septum narium.
b, *b*, The ossa spongiosa superiora, convex towards the septum of the nose, and concave outwards.
Between the ossa spongiosa and nasal plate deep chinks are seen, which separate these processes from each other.
c, *c*, Inequalities by which this bone is joined to the frontal one.
d, *d*, The sphenoid cornua.

FIG. 11.

The Inner and Upper Surface of the SPHENOID BONE.

a, The fore-part of the bone, which joins the under and back part of the frontal one.
b, *b*, The temporal plates or processes.
c, *c*, The transverse processes.
d, A small anterior process, which unites with the ethmoid bone.
e, The processus olivaris.

f, *f*, The foramina optica.
g, *g*, The anterior clinoid processes.
h, *h*, The posterior clinoid processes.
i, *i*, Part of the foramina lacera.
k, *k*, Impressions made by the internal carotid arteries.
l, The sella Turcica.
m, *m*, The temporal fossæ, which receive the lateral lobes of the brain.
n, *n*, The foramina rotunda.
o, *o*, The foramina ovalia.
p, *p*, The foramina spinalia.
q, *q*, Ragged end of the bone which assists in forming the sphenoid suture.
r, The back part of the body of the bone, which joins the cuneiform process of the occipital one.
s, *s*, Part of the spinous, and,
t, *t*, Part of the pterygoid processes.

FIG. 12.

The Outer or Inner Surface of the SPHENOID BONE.

a, The processus azygos.
b, *b*, The sphenoid cornua.
c, *c*, The openings of the sphenoid sinuses.
d, *d*, The foramina lacera.
e, The fore-part of the body of the bone.
f, *f*, The outer surface of the transverse processes.
g, *g*, The orbitar plates.
h, *h*, The temporal processes.
i, *i*, The asperities by which this bone is joined to the ossa malarum.

k, *k*, Gutters, which lodge branches of the fifth pair of nerves.

l, *l*, The foramina rotunda.

m, *m*, The foramina pterygoidea.

n, *n*, Anterior openings, which assist in forming the sphenoid fissures.

o, *o*, The foramina ovalia.

p, *p*, The spinous processes.

q, *q*, The roots of the pterygoid processes.

r, *r*, The internal plates of the pterygoid processes.

s, *s*, Hook-like processes at the extremities of the internal plates.

t, *t*, The external plates of the pterygoid processes.

u, *u*, Parts of the bone adapted to the ossa palati.

v, *v*, Posterior openings, common to the occipital and temporal bones, over which the internal carotid arteries pass.

TABLE IV.

REPRESENTS the different BONES of the FACE, a Section of the NOSE, the Inner and Under Sides of the SKULL, with the Small Bone termed OS HYOIDES.

FIG. 1.

The Outer Surface of the OSSA NASI.

a, *a*, The upper part, which is joined to the frontal bone.

b, *b*, The lower ragged end, to which the cartilage of nose is fixed.

The black points represent holes penetrating the bones.

FIG. 2.

The Inner Surface of the OSSA NASI.

a, *a*, The inner edge of each, thick and strong, where it joins its fellow, and sends a spine backwards, to be fixed to the partition of the nose.

b, *b*, The cavity which forms part of the arch of the nose.

FIG. 3.

The Outer Surface of the Left OS UNGUIS.

a, The lacrymal process, perforated by numerous holes.

b, the orbitar process.

c, the ridge which separates the processes.

FIG. 4.

The Inner Side of the OS UNGUIS, *with Eminences and Cavities which belong to the Ethmoid Cells.*

FIG. 5.

The Outer Surface of the Right Os Male.

a, The superior orbitar process.
b, The inferior orbitar process.
c, The internal orbitar plate.
d, The maxillary process.
e, The zygomatic process.
f, The external orbitar hole.
g, *g*, The under and outer edge of the orbit.
h, Part of the inner rough surface of the maxillary process.
i, The zygomatic nitch.

FIG. 6.

The Inner Surface of the same.

a, *b*, *c*, *d*, *e*, as in Fig. 5.
f, The internal fossa, and situation of the external orbitar hole.
g, *g*, The rough edge which joins the os malæ to the superior maxillary bone at the external orbitar suture.

FIG. 7.

The Outer Side of the Right Superior Maxillary Bone, *with a small Portion of the* Os Palati.

a, The maxillary fossa.
b, The nasal process of the maxillary bone.
c, Inequalities, by which it is joined to the os frontis.
d, The angle which is joined to the under end of the os nasi, and to the cartilage of the nose.
e, The orbitar plate.
f, The edge of the orbit.

g, A groove which belongs to the infra-orbitar canal.
h, *h*, *i*, *i*, The malar process.
k, *k*, The alveolar process.
l, The maxillary tuberosity.
m, A small portion of the os palati.
n, *n*, Small holes which penetrate the bone.
o, The fore part of the nostril.
p, The nasal spine, forming part of the partition of the nose.
q, The palate-plate.
r, The foramen infra-orbitarium.
s, *s*, The two dentes incisores.
t, The dens caninus.
u, *u*, The five dentes molares.

FIG. 8.

The Inner Surface of the Superior Maxillary, *and of the* Palate Bones.

a, The nasal process, or upper angle.
b, The middle angle at the base of the nasal process.
c, Inequalities, where the fore part of the os spongiosum inferius is fixed.
d, The palate process.
e, The alveolar process.
f, The irregular surface of the palate process, which joins its fellow of the opposite side.
g, The maxillary sinus.
h, Small cells in the upper part of the bone.
i, The lacrymal fossa.
k, The palate fissure, which assists in forming the foramen incisivum.

l, The suture which unites this bone to the os palati.
m, The part of the bone which forms the largest share of the nasal fossa.
n, The nasal spine.
o, A rough surface, where the fore part of the bone joins its fellow.
p, The palate bone.
q, The small sinus commonly found in this bone.
r, The nasal lamella of the palate bone, forming part of the maxillary sinus, and of the cavity of the nostril.
s, An eminence, where this bone is connected to the inferior spongy one.
t, The rough surface, where the two palate bones unite.
u, The hole proper to this bone.
v, The foramen gustativum, vel palatinum posterius.
w, The pterygoid process.
x, *x*, The teeth.

FIG. 9.

The Posterior and almost the whole of the Exterior Surface of the Left Os Palati.

a, The palate plate.
b, The pterygoid process.
c, The nasal plate.
d, The orbitar process.
e, A small sinus, corresponding with those of the ethmoid bone.
f, The notch which forms part of the foramen sphenopalatinum.
g, A small hole which penetrates the bone.

h, Part of the groove which helps to form the foramen gustativum.

FIG. 10.

The Anterior, and almost all the External Surface of the same Palate Bone.

a, A notch which assists in forming the foramen gustativum.
b, The orbitar process.
c, The palate plate.
d, The nasal plate.
e, The groove which helps to form the foramen gustativum.
f, The pterygoid process.

FIG. 11.

The External Concave Surface of the Os Spongiosum Inferius *of the Left Side.*

a, The under edge of the bone turning outwards.
b, The upper edge, sending down a hook-like plate, to cover a portion of the maxillary sinus.
c, The broad anterior extremity, where the connexion is chiefly made with the superior maxillary bone.
d, The posterior extremity, narrow and irregular in its surface.
e, The external surface, with numerous small holes, which mark its porosity.
f, The part which joins the os unguis, to form a share of the lacrymal groove.

FIG. 12.

The Inner Convex Surface of the same OS SPONGIOSUM INFERIUS, *which, like the External Surface, is also of a Spongy Texture.*

FIG. 13.

The Left Side of the VOMER.

a, The hollow surface, which receives the processus azygos of the sphenoid bone.
b, The anterior and upper edge, which is connected to the nasal plate of the ethmoid bone, and middle cartilage of the nose.
c, The inferior edge, which is connected to the palate plates of the superior maxillary and palate bones.
d, A ridge upon the side of the vomer.

FIG. 14.

The LOWER JAW, *viewed from the Right Side.*

a, The symphysis of the jaw.
b, *b*, Muscular prints.
c, Another depression, which marks the middle of the chin.
d, The base of the jaw.
e, The angle of the right side.
f, The inner surface of the angle of the left side.
g, The ascending plate, with muscular prints.
h, *h*, The coronoid, and,
i, *i*, The condyloid processes.
k, *k*, The cervix on each side.
l, *l*, Semilunar notches between the processes.

m, The posterior maxillary foramen.
n, The anterior maxillary foramen.
o, The alveoli of the teeth.
p, The two dentes incisores of the right side.
q, The dens caninus.
r, The five dentes molares.

FIG. 15.

The TEETH.

a, A fore and back view of the incisores of the under jaw.
1. The base or body of a tooth, covered with enamel.
2. The root, or fang, destitute of enamel.
3. The neck, or collar.

b, Sections of two teeth, to shew the extent of the enamel, with the direction of its fibres.—The fibrous and lamellated structure of the osseous part.—The internal cavity for containing the pulp.
The second *b* shews a fore and back view of the incisores of the upper jaw.
c, A fore and back view of the dentes canini.
d, The two small molares.
e, The three large molares.

FIG. 16.

The Left Portion of the Base of the SKULL, *divided from the Septum Narium, by a perpendicular Section, proceeding in a straight line from before backwards.*

a, Part of the frontal bone.
b, The posterior lamina, called vitrea.
c, The frontal sinus.
d, Part of the transverse suture, dividing the frontal from the superior maxillary bone.

e, Part of the frontal bone, contiguous to the os ethmoides.
f, The upper part of the ethmoid bone.
g, *g*, The cells of the ethmoid bone, the anterior of which are entire, the rest laid open.
h, *h*, The openings of the ethmoid cells into the nose.
i, The uppermost passage of the nostril.
k, The left anterior clinoid process of the sphenoid bone.
l, The posterior clinoid process.
m, The sella Turcica.
n, The sphenoid sinus
o, The part where the sinus opens into the upper and back part of the nose.
p, A section of the body of the sphenoid, and of the cuneiform process of the occipital bone.
q, The spinous process of the sphenoid bone.
r, The internal pterygoid plate.
s, The fore part of the meatus auditorius.
t, The superior condyloid foramen.
u, The mastoid process of the temporal bone.
v, The inner side of the occipital bone.
w, The cut edge of that bone.
x, The under and outer part of that bone.
y, The nasal process of the superior maxillary bone.
z, The inner side of that bone, forming the middle passage of the nostril.
1, Part of the same bone, which forms the beginning of the lower passage of the nostril.
2, A section of the alveolar process.
3, A section of the osseous palate.
4, The spongiosum superius.
5, The middle passage of the nostril.

6, The opening of the antrum maxillare.
7, The os spongiosum inferius.
8, That part of the inferior spongy bone which lies over the opening of the lacrymal duct.
9, The lowest passage of the nostril.

FIG. 17.

A view of the Inner Surface of the Base of the CRANIUM. *See also* TAB. V.

a, The zygoma.
b, The mastoid process of the temporal bone.
c, The external surface of the occipital bone.
d, *d*, The frontal fossæ marked by the brain.
e, Part of the frontal spine.
f, The foramen cæcum, placed at the bottom of the frontal spine.
g, The cribriform plate of the ethmoid bone.
h, The crista galli of this bone.
i, The sella Turcica of the sphenoid bone.
k, *k*, The anterior clinoid processes.
l, The posterior clinoid process.
m, A small process of the sphenoid bone, fixed to the ethmoid one.
n, *n*, Part of the sphenoid suture.
o, The processus semi-olivaris.
p, *p*, The temporal fossæ.
q, *q*, The transverse spinous processes.
r, *r*, The foramina optica.
s, *s*, A small portion of the foramina lacera.
t, *t*, The foramina rotunda.
u, *u*, The foramina ovalia.

v, *v*, The foramina spinalia.
w, *w*, Impressions made by the internal carotid arteries.
x, *x*, Points of the partes petrosæ of the temporal bones, and, before these, irregular openings, which in the subject are filled, partly by bone, and partly by a ligamentous substance.
y, *y*, Suture common to the sphenoid and temporal bones.
1, 1, Squamous parts of the temporal bones, which complete,
2, 2, The temporal fossæ for the lateral lobes of the brain.
3, 3, The ridge of the pars petrosa on each side, to which the tentorium is fixed.
4, 4, The posterior surface of the pars petrosa on each side, which is opposed to the cerebellum.
5, The foramen innominatum.
6, The groove which lodges the superior petrosal sinus.
7, 7, The meatus auditorii interni.
8, 8, The foramina lacera common to the temporal and occipital bones.
9, 9, The fossæ for lodging the lateral sinuses.
10, The cuneiform process of the occipital bone.
11, 11, The anterior condyloid foramina of that bone.
12, The foramen magnum.
13, 13, The inferior occipital fossæ, which lodge the corresponding lobes of the cerebellum.
14, The inferior limb of the cruciform spine, to which the falx minor is fixed.
15, Part of the lambdoid suture.
16, 16, The fossæ for the inferior petrosal sinuses.
17, 17, The cut edge of the skull.

FIG. 18.

Represents the Outer and Under Surface of the SKULL, *turned a little to the Left Side.*

a, The parietal bone.
b, The lambdoid suture.
c, *c*, The large transverse arched ridge of the occipital bone.
d, *d*, The smaller transverse ridge, with muscular prints on each side of it.
e, The spinous tuberosity, seen in some skulls only.
f, The perpendicular spine.
g, The foramen magnum.
h, The cuneiform process.
i, *i*, The articular or condyloid processes.
k, *k*, The posterior condyloid foramina.
l, The squamous portion of the temporal bone.
m, The squamous suture.
n, *n*, The mastoid processes.
o, *o*, The mastoid fissures.
p, The foramen mastoideum.
q, The zygoma and zygomatic suture.
r, The glenoid cavity at the root of the zygoma, for the articulation of the lower jaw.
s, *s*, The styloid processes, behind the roots of which the foramina stylo-mastoidea are concealed.
t, The meatus auditorius externus.
u, *u*, The foramina carotica.
v, *v*, The jugular fossæ.
w, *w*, The pterygoid fossæ, at the sides of which are the pterygoid plates.
x, The temporal process of the sphenoid bone.
y, The spinous process and spinous hole of that bone.

TABLE IV. CONTINUED.

z, *z*, The osseous mouths of the EUSTACHIAN tubes.
1, 1, The foramina ovalia.
2, 2, Passages common to the occipital, temporal, and sphenoid bones.
3, 3, The foramina pterygoidea.
4, The inferior orbitar fissure.
5, The under part of the tube or bulge of the superior maxillary bone.
6, 6, The inner sides of the ossa malarum.
7, 7, The superior and inferior spongy bones, with a view of the back part of the nostrils.
8, The posterior edge of the vomer.
9, 9, The palate plates of the superior maxillary bones, with the longitudinal palate suture.
10, 10, The palate plates of the palate bones, with the transverse, and continuation of the longitudinal palate sutures.
11, 11, The foramina gustativa, or posterior palate holes.
12, The foramen incisivum, or anterior palate hole.
13, 13, The teeth, divided into two incisores, one caninus, two small molares, and three large molares on each side.

FIG. 19.

The OS HYOIDES, *seen from the Upper and Fore Part.*

a, The body of the os hyoides.
b, *b*, Its cornua.
c, *c*, Its appendices.

TABLE V.

The different parts of this Figure are the same with those of TAB. IV. FIG. 17. but of the natural size.

TAB. 5.

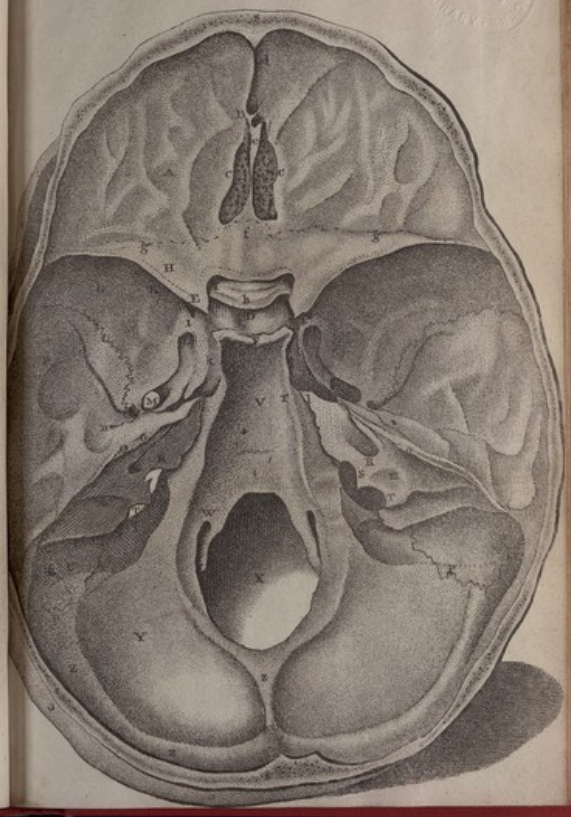


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

TABLE Va.

REPRESENTS the MUSCLES situated on the Fore Part of the HEAD and NECK.

FIG. 1.

The First Order of MUSCLES *on the Fore Part of the* HEAD *and* NECK, *after the Integuments have been removed.*

a, The frontal part of the occipito-frontalis.
b, The tendon of that muscle.
c, A fleshy slip descending from the occipito-frontalis over the root of the nose.
d, The attollens aurem.
e, The anterior auris.
f, The orbicularis palpebrarum.
g, The ciliary part of the orbicularis.
h, The compressor naris.
i, The levator labii superioris alæque nasi.
k, The zygomaticus minor.
l, The zygomaticus major.
m, The levator anguli oris.
n, The cartilage of the nose.
o, The depressor anguli oris.
p, The depressor labii inferioris.
q, The buccinator.

r, The orbicularis oris.
s, The masseter.
t, The platysma myoides, its upper end passing over the jaw.
u, The sterno-cleido-mastoideus.

FIG. 2.

The Second Order of MUSCLES *on the Fore Part of the* HEAD *and* NECK.

a, the corrugator supercilii.
b, The levator palpebræ superioris.
c, The temporalis, the tendon of which is seen passing under the zygoma.
d, The masseter.
e, The levator anguli oris.
f, The buccinator.
g, The orbicularis oris.
h, The nasalis labii superioris, at the upper side of which is a portion of the depressor labii superioris alæque nasi.
i, The depressor labii inferioris.
k, The sterno-cleido-mastoideus.
l, The sterno-hyoideus.
m, Part of the trachea.
n, The omo-hyoideus.
o, The hyo-thyroideus.
p, The os hyoides.
q, The levator scapulæ.
r, The scalenus medius.

FIG. 3.

The Third Order of MUSCLES *on the Fore Part of the* HEAD *and* NECK.

a, The insertion of the abductor oculi.
b, The adductor oculi of the right side.
c, The insertion of the levator oculi.
d, The trochlea, and part of the tendon of the obliquus superior.
e, The obliquus inferior.
f, The depressor labii superioris alæque nasi.
g, The orbicularis oris.
h, The buccinator.
i, The levator labii inferioris.
k, Part of the pterygoideus externus.
l, Part of the pterygoideus internus.
m, The sterno-hyoideus.
n, The thyro-hyoideus.
o, The os hyoides.
p, The thyroid cartilage.
q, The cricoid cartilage, with the two crico-thyroid muscles arising from it.
r, The trachea.
s, Part of the pleura.
t, The scalenus anticus.
u, The scalenus medius.
v, A portion of the trachelo-mastoideus.
w, The rectus capitis anterior major.
x, The longus colli.
y, The constrictor pharyngis inferior.

FIG. 4.

The Fourth Order of MUSCLES *on the Fore part of the* HEAD *and* NECK.

a, The levator palpebræ superioris.
b, The levator oculi.
c, The adductor oculi.
d, The abductor oculi.
e, The depressor oculi.
f, The obliquus superior.
g, The obliquus inferior.
h, The pterygoideus internus.
i, The obliquus superior capitis.
k, The scalenus medius.
l, The longus colli.
m, *m*, The intertransversales colli.

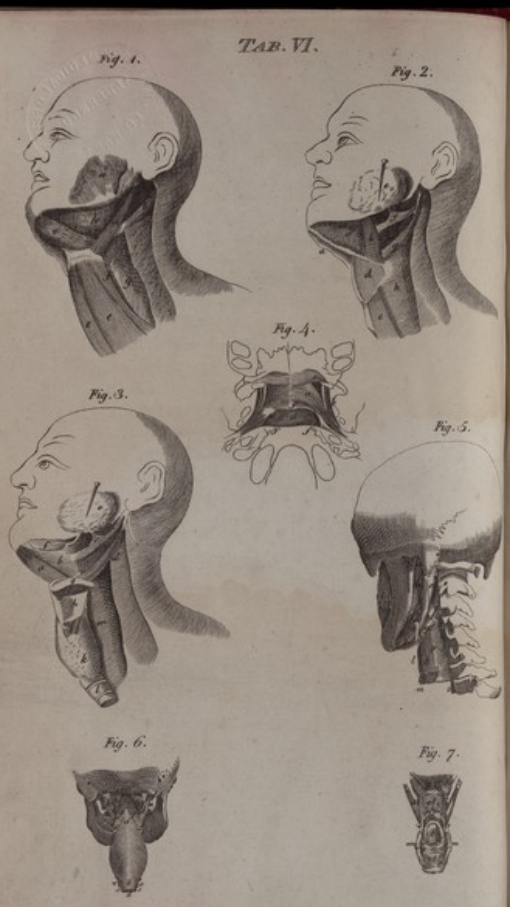


TABLE VI.

REPRESENTS the MUSCLES situated about the Throat.

FIG. 1.

Part of the Muscles of the Os HYOIDES.

a, Part of the masseter.
b, The posterior head of the digastricus.
c, Its anterior head.
d, The stylo-hyoideus, with the tendon of the digastric passing through it.
e, *e*, The sterno-hyoidei.
f, The omo-hyoideus.
g, The pharynx.
h, The submaxillary gland.

FIG. 2.

MUSCLES *deeper seated than the former.*

a, *a*, The mylo-hyoidei.
b, The hyo-glossus.
c, The sterno-thyroideus.
d, The thyro-hyoideus.
e, The submaxillary gland, raised from its place behind the angle of the lower jaw.
f, The stylo-glossus, supported by a ligament.
g, The stylo-pharyngeus.
h, The pharynx.

FIG. 3.

MUSCLES *deeper seated than the former.*

a, The genio-hyoideus.
b, The genio-hyo-glossus.
c, The stylo-glossus, with its supporting ligament.
d, The stylo-pharyngeus.
e, The submaxillary gland, raised, by which its duct is seen advancing towards its termination at the side of the frænum linguæ.
f, The sublingual gland.
g, The os hyoides.
h, The thyroid cartilage.
i, The cricoid cartilage, with the crico-thyroid muscles.
k, The thyroid gland.
l, The trachea.
m, The pharynx.

FIG. 4.

Muscles of the PALATE, *viewed on the under side.*

a, The levator palati.
b, *c*, The circumflexus palati; *c*, Its tendon passing over the hook-like process of the pterygoid plate.
d, The membrane of the palate.
e, *e*, The mouths of the EUSTACHIAN tubes.
f, *f*, *f*, The circumference from which the membrane of the palate is cut off.

FIG. 5.

A lateral View of the Muscles *seated under the* HEAD *and before the Vertebræ of the* NECK.

a, The pterygoideus externus.

b, The pterygoideus internus.
c, The mylo-hyoideus.
d, The stylo-hyoideus.
e, *f*, The digastricus.
g, *h*, The hyo-glossus.
i, The os hyoides.
k, The thyro-hyoideus.
l, The thyroid cartilage.
m, The crico-thyroideus.
n, The cricoid cartilage.
o, A section of the esophagus.
p, The constrictor pharyngis inferior.
q, The constrictor pharyngis medius.
r, The constrictor pharyngis superior.

FIG. 6.

A back view of the PHARYNX, *with the Under Part of the* BONES *of the* HEAD, *to which the Pharynx is fixed.*

a, The upper point of the constrictor pharyngis inferior.
b, The upper end of the pharynx, and inner transverse fibres of the esophagus.
c, *c*, The outer fibres of the esophagus, descending obliquely backwards on each side.
d, A section of the esophagus.
e, *e*, A section of the trachea.
f, *f*, The extremities of the cornua of the os hyoides, with the ligaments which join them to the superior cornua of the thyroid cartilage.
g, *g*, The constrictor pharyngis medius, on each side.
h, *h*, The constrictor pharyngis superior, on each side.
i, The naked membrane of the pharynx.

k, *k*, The stylo-pharyngeus, on each side.
l, *l*, The styloid process of the temporal bones.
m, *m*, The pterygoid process of the sphenoid bone.
n, *n*, The backmost tooth of the upper and under jaws, on each side.

FIG. 7.

The MUSCLES *lying immediately under the* MEMBRANE *of the* PHARYNX, *which, with the* ESOPHAGUS *and* TRACHEA, *are removed.*

a, The levator palati.
b, The azygos uvulæ.
c, The palato-pharyngeus.
d, That part of it which passes under the levator palati.
e, That part of it called by ALBINUS *Salpingo-pharyngeus.*
f, Part of the common end of the palato-pharyngeus and stylo-pharyngeus.
g, The posterior edge of the velum palati.
h, The uvula.
i, The tonsil, projecting before the palato-pharyngeus muscle.
k, The tongue.
l, The epiglottis.
m, *m*, The points of the arytenoid cartilages.
n, The arytenoidei obliqui.
o, *o*, The arytenoideus transversus.
p, The crico-arytenoideus posticus.
q, The cricoid cartilage.
r, *r*, The posterior edges of the thyroid cartilage, which conceal the two small muscles on each side, termed *Crico-arytenoideus Lateralis* and *Thyro-arytenoideus.*

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

TABLE VII.

REPRESENTS the MUSCLES situated on the Back Part of the HEAD and NECK.

FIG. 1.

The First Order of MUSCLES *on the Back Part of the* HEAD *and* NECK, *after the Integuments have been removed.*

a, The occipital part of the occipito-frontalis muscle.
b, The fleshy, and,
c, The tendinous part of this muscle.
d, A tendinous membrane, joining the opposite sides of the muscle.
e, Part of the tendinous membrane, covering the upper part of the temporal muscle.
f, The attollens aurem.
g, The anterior auris.
h, A small portion of the retrahentes aurem.
i, The back part of the orbicularis palpebrarum.
k, The zygomaticus major.
l, The masseter.
m, The pterygoideus internus.
n, The platysma myoides.
o, The sterno-cleido-mastoideus.
p, The upper end of the trapezius.
q, The tendinous portion of that muscle, in the nape of the neck, called *Ligamentum Nuchæ*.

FIG. 2.

The Second Order of MUSCLES *on the Back Part of the* HEAD *and* NECK.

a, The temporalis, the aponeurosis being removed.
b, The tendon of the temporal muscle, passing under the zygoma.
c, The pterygoideus internus.
d, The masseter.
e, The mylo-hyoideus.
f, The levator scapulæ.
g, The splenius.
h, The upper end of the complexus.
i, A portion of the rhomboides major.
k, Part of the rhomboides minor,
l, The upper end of the serratus posticus superior.

FIG. 3.

The Third Order of MUSCLES *on the Back Part of the* HEAD *and* NECK.

a, The back part of the buccinator.
b, The pterygoideus internus.
c, The mylo-hyoideus.
d, *e*, *f*, The complexus; *f*, A fleshy slip from the spinous process of the first dorsal vertebra.
g, The trachelo-mastoideus.
h, The scalenus medius.
i, The scalenus posticus.
k, The semi-spinalis colli.
l, *l*, The interspinales colli.
m, The obliquus capitis superior.

n, The transversalis colli.
o, The upper end of the longissimus dorsi, joining the trachelo-mastoideus, and,
p, The fleshy slip from the sacro-lumbalis, called *Cervicalis Descendens.*

FIG. 4.

The Fourth Order of MUSCLES *on the Back part of the* HEAD *and* NECK.

a, The rectus capitis posterior minor.
b, The rectus capitis posterior major.
c, The obliquus capitis superior.
d, The obliquus capitis inferior.
e, The scalenus medius.
f, The upper end of the multifidus spinæ.
g, *g*, The interspinales colli.
h, *h*, The intertransversales colli.
i, *i*, The semi-spinalis colli.

TABLE VIII.

Represents Muscles on the fore Part of the Trunk of the Body.—On the Right Side, the Muscles are exposed which lie immediately under the Common Integuments.—On the Left Side, the Muscles are seen which are placed under the former.

Thorax.

a, The under end of the platysma myoides.
b, The pectoralis major, with the deltoides at the outer side of it.
c, *c*, Part of the serratus magnus.
d, The edge of the latissimus dorsi.
e, The subclavius.
f, The pectoralis minor.
g, *g*, The serratus magnus. Farther out, the subscapularis is seen.
h, *h*, The intercostales interni, the tendinous fascia being removed.

Abdomen.

i, *i*, The obliquus descendens externus.
k, The beginning of the tendon of that muscle.
l, The obliquus internus, shining through the tendon of the obliquus externus.
m, *m*, The linea semilunaris.
n, *n*, The rectus abdominis, also shining through the tendon of the obliquus externus.

o, *o*, The tendinous intersections of the rectus.
p, *p*, The linea alba.
q, The umbilicus.
r, The pyramidales.
s, The ring of the external oblique muscle, transmitting the spermatic cord.
t, The cremaster muscle, covering the spermatic cord.
u, The lower edge of the external oblique muscle, termed *Ligament of* POUPART.
v, The obliquus internus ascendens.
w, *w*, The tendon of the obliquus internus, part of which is left covering the outer side of the rectus muscle.—Between the two *w*'s the tendon splits into two layers, which inclose the rectus. From the lower *w* to the pubis, the whole of the tendon goes before the rectus.
x, *x*, The rectus abdominis.
y, *y*, *y*, The tendinous intersections of the rectus.
z, The cremaster testis.

TABLE IX.

REPRESENTS the Third Layer of MUSCLES on the Right, and the Fourth Layer of MUSCLES on the Left Side of the Anterior Part of the TRUNK of the Body.

FIG. 1.

THORAX.

a, The intercostales externi.
b, *b*, *b*, *b*, The intercostales interni.
c, *c*, The convex or thoracic side of the diaphragm.
d, Its middle tendon.
e, *f*, *g*, *h*, The fleshy origins of the diaphragm, separated from the inferior margin of the thorax.

ABDOMEN.

i, The transversalis abdominis.
k, That portion of the tendons of the internal oblique and transverse muscles, which lies behind the rectus.
l, The remains of the tendons of the oblique and transverse muscles, forming the linea alba.
m, The spermatic vessels, passing under the edge of the transverse muscle.
n, The peritoneum, marked by one of the umbilical arteries and the urachus.
o, The tendinous crura of the inferior muscle of the diaphragm.
p, The passage for the aorta, between the crura.
q, *q*, The fleshy heads of the small muscle of the diaphragm.
r, The part where the fibres of the fleshy heads of the opposite sides cross each other to form,

Fig. 1.

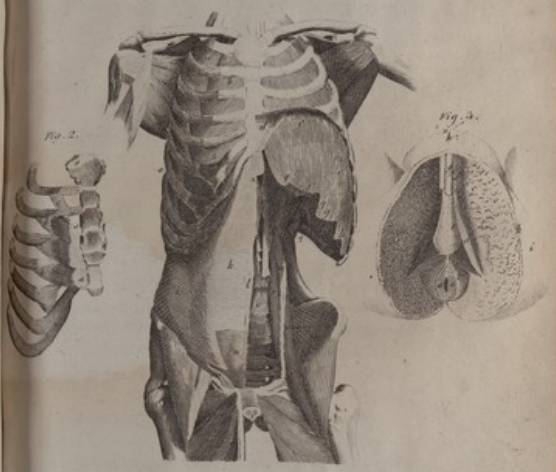


Fig. 2.

Fig. 3.

s, The passage of the esophagus.
t, The origin of the diaphragm from the twelfth rib.
u, The psoas parvus.
v, *v*, The psoas magnus.
w, The iliacus internus.
x, A section of the penis, in which the corpora cavernosa appear.

FIG. 2.

A View of the Inner Surface of the STERNO-COSTALIS MUSCLE.

a, *a*, The tendinous origin, from the cartilago ensiformis, and under half of the middle bone of the sternum.
b, *b*, The tendinous insertion into the third, fourth, and fifth ribs.
c, Part of the sterno-costalis, passing between the second and third ribs, and which is found in some subjects only.

FIG. 3.

MUSCLES *about the root of the* PENIS, *and Under End of the* INTESTINUM RECTUM,—*in a Child.*

a, *a*, The sphincter ani.
b, The levator ani.
c, The transversalis perinei.
d, The erector penis.
e, The accelerator urinæ.
f, The corpus cavernosum penis.
g, The corpus spongiosum urethræ.
h, The scrotum turned up.
i, Part of the thigh.
k, The cut edge of the integuments.

TABLE X.

Represents the First Layer of Muscles on the Right, and Second Layer of Muscles on the Left Side of the Back Part of the Trunk of the Body.

Right Side.

a, a, The thoracic portion of the trapezius.
b, b, Its insertion into the spine of the scapula.
c, The ligamentum nuchæ.
d, d, The latissimus dorsi.
e, Its tendinous origin.
f, Part of the obliquus externus abdominis.
g, Part of the rhomboideus.

Left Side.

h, The rhomboides major, and,
i, The rhomboides minor, covering the serratus posticus superior.
k,* A portion of the serratus posticus superior, the rest of it extending as far under the rhomboides as the dotted line at *h*.
l, The part from which the latissimus dorsi was cut.
m, The under part of the serratus magnus.
n, The tendons of the sacro-lumbalis.
o, A portion of the longissimus dorsi.
p, Part of the semi-spinalis dorsi.
q, The spinalis dorsi.
r, The broad tendon common to the latissimus dorsi and serratus posticus inferior.

TABLE X. CONTINUED.

s, The back part of the obliquus internus abdominis.
t, *t*, The intercostales externi.
u, The coccygeus.
v, The levator ani.
w, The sphincter ani.

TABLE XI.

Represents the Third Layer of Muscles on the Right, and Fourth Layer of Muscles on the Left Side of the Back Part of the Trunk of the Body.

Right Side.

a, *a*, *a*, The spinalis dorsi.
b, *b*, Part of the semi-spinalis dorsi.
c, The longissimus dorsi.
d, *d*, The tendons of the sacro-lumbalis.
e, The common fleshy head of the longissimus dorsi and sacro-lumbalis.
f, The tendon covering and partly giving origin to this fleshy head.
g, Part of this tendon upon the longissimus dorsi.
h, The transversalis abdominis.
i, *i*, The intercostales externi.
k, *k*, Portions of the intercostales externi, called by Albinus *Levatores Costarum*.

Left Side.

a, *a*, The semi-spinalis dorsi.
b, *b*, The multifidus spinæ.
c, *c*, The intercostales interni.

TABLE XI. CONTINUED.

d, d, The pleura.
e, e, The intertransversales dorsi.
f, f, The interspinales dorsi.
g, The quadratus lumborum.
h, h, The intertransversales lumborum.
i, i, The interspinales lumborum.

TABLE XI*A*.

This Plate contains the Anatomy of the Parts about the Groin in both Sexes, or of the Parts concerned in Inguinal and Crural Hernia.—All the Figures, excepting the Third, belong to the Left Side of the Body.—Fig. 2. 5. 6. are taken by the Author from Nature.—Fig. 1. 3. 4. 7. 8. are Sketches from the highly finished Work of Mr Cooper on Hernia.

FIG. 1.

Shews the Formation of the Abdominal Rings in the Male, the Course of the Spermatic Cord through these, and the Form and Situation of some of the Fasciæ.

a, The external abdominal ring.

b, The upper column of the tendon which assists in the formation of this ring.

c, The under column of this tendon, extending from,

d, The crural arch, or ligament of Poupart, to be fixed to the pubis.

e, The ilial, and,

f, The pubal portion of the fascia lata femoris.

g, The vena saphena perforating the fascia lata, to terminate in the femoral vein.

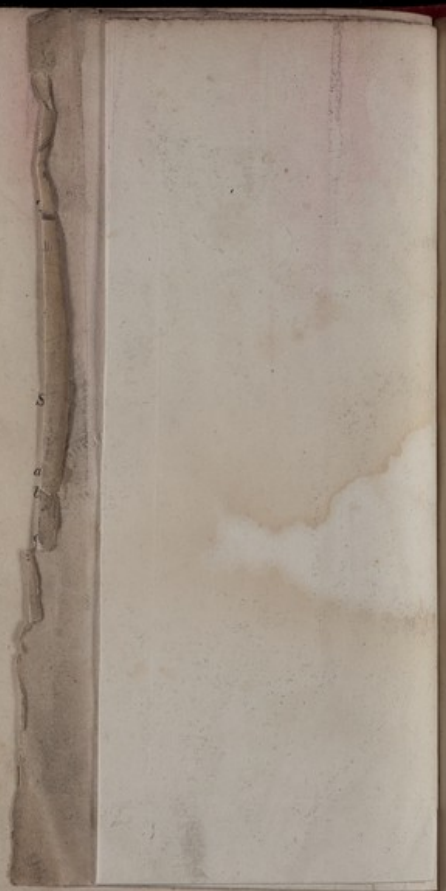
h, The tendon of the external oblique muscle, cut and reflected, to shew parts deeper seated.

i, The lower edge of the internal oblique muscle, cut from the crural arch, and also reflected.

k, The transversalis, the lower edge of which is cut and turned up.

l, The transverse fascia, running up from the crural arch to line the back part of the transverse muscle


Fig. 3.
Fig. 6.
Fig. 4.
Fig. 2.
Fig. 7.
Fig. 8.



and its tendon, thereby preventing crural hernia from happening between the external iliac blood-vessels and the superior-anterior spinous process of the os ilium.

m, The internal abdominal ring.

n, The epigastric blood-vessels, passing first at the inner side of, and then behind the spermatic cord.

o, The spermatic cord, descending through the abdominal ring, shewing at the same time the length of the inguinal canal, and the course the bowels take in inguinal hernia.

p, The spermatic cord, in its descent to the testicle.

FIG. 2.

Exhibits a Portion of the Tendinous Fasciæ about the Groin, in the Female.

a, The superficial fascia, which covers the tendon of the external oblique muscles of the abdomen, cut from the ligament of POUPART, and turned up.

b, That part of the superficial fascia, which covers the fascia lata femoris at the upper part of the thigh, cut and turned outwards.

c, The under end of the tendon of the external oblique muscle, forming the ligament of POUPART.

d, The round ligament of the uterus, passing through the external abdominal ring.

e, The fascia lata femoris, descending from the under edge of POUPART's ligament.

f, The crescentic or falciform edge of this fascia.

g, The vena saphena, passing through a notch in the fascia, to terminate in the femoral vein.

h, A vein descending from the integuments of the abdomen, also to terminate in this vein.

i, *i*, Some lymphatic glands situated in the notch at the side of the vena saphena, where crural herniæ happen.

FIG. 3.

Represents the External Abdominal Ring, and the Falciform Ligament, or Semilunar Edge of the Fascia Lata Femoris, in the Female.

a, The symphysis of the pubis.

b, The external abdominal ring, with the upper and under columns by which it is formed.

c, The crural arch.

d, *e*, The fascia lata of the thigh; *d*, the ilial; and *e*, the pubal portion of this fascia.

f, *f*, The semilunar or falciform edge of the fascia.

g, The crural sheath.

h, The vena saphena.

i, The place where the bowels protrude in femoral hernia.

FIG. 4.

Shews the Insertions of the Tendon of the External Oblique Muscle into the Os Pubis; The Iliac Fascia, and the Orifice of the Crural Sheath, in the Female.

a, The pubis.

b, The external abdominal ring, with two orifices in it, which happens occasionally.

c, The anterior surface of the crural arch; above the letter is seen the direction of the fibres of the tendon of the external oblique muscle, and curved tendinous lines decussating that tendon.

d, The third insertion of the tendon of the external oblique muscle, or that part of the tendon which is fixed to the upper part and spine of the pubis.

e, The ligament covering the os pubis, into which the third insertion of this tendon is fixed.

f, A portion of the fascia transversalis, and tendon of the rectus, passing behind the insertion of the external oblique muscle.

g, The fascia iliaca, passing from the crural arch over the internal iliac muscle.

h, The orifice of the crural sheath, for the passage of the femoral blood-vessels and absorbents.

FIG. 5.

Gives a View of the Inner Side of the Crural Arch, and of the Passage of the Blood-Vessels which go under it, in the Male.

a, *a*, The abdominal muscles reflected.

b, *c*, *d*, The posterior, or inner part of the crural arch; *d*, A portion of this arch, forming the third insertion of the external oblique muscle, and which is broader than in the female.

e, The iliac fascia, covering the internal iliac muscle.

f, Part of the large psoas muscle.

g, The external iliac artery, sending off,

h, The internal circumflex artery of the os ilium, and,

i, The epigastric artery.

k, The external iliac vein, receiving the circumflex and epigastric veins.—The circumflex artery and vein are seen in this place, where the iliac joins the transverse fascia.

l, The crural ring, where femoral herniæ occur.

m, The spermatic blood-vessels.
n, The vas deferens, departing from the blood-vessels, to get into the pelvis.

FIG. 6.

View of the Inside of the Crural Arch in the Female, and Parts somewhat corresponding with those seen in the former Figure.

a, The symphysis of the pubis.
b, The brim of the pelvis.
c, *d*, The crural arch, or ligament of POUPART. The letter *d* is placed on that part of the ligament that is recommended by GIMBERNAT to be cut in crural hernia.
e, The iliac fascia covering the internal iliac muscle.
f, The large psoas muscle, with a branch of the lumbar nerves running along it to the thigh.
g, *h*, *i*, The round ligament of the uterus; *h*, the place where it passes through the fascia transversalis; *i*, the ligament descending towards the groin.
k, The external iliac artery.
l, The epigastric artery.
m, The circumflex artery of the os ilium.
n, The obturator artery, in this subject arising from the external iliac.
o, The external iliac vein, receiving branches corresponding with those sent off from the iliac artery.
p, The crural ring.
q, The third insertion of POUPART's ligament.

FIG. 7.

Sketch of the Inner Side of that Part of the Parietes of the Abdomen, which separates this Cavity from the Thigh, and of the Iliac Blood-vessels passing through the Crural Ring, in the Female.

a, *a*, The symphysis of the pubis.
b, The rectus abdominis, inserted into the symphysis of the pubis.
c, The fascia iliaca.
d, *e*, The fascia transversalis; *e*, that part of it which passes from the pubis to join the tendon of the rectus.
f, The round ligament of the uterus, passing through the fascia transversalis, to get into the inguinal canal.
g, The iliac artery.
h, The beginning of the epigastric artery, with its associate vein.
i, The circumflex artery.
k, The iliac vein.
l, The crural space or ring, through which femoral herniæ descend.

FIG. 8.

The Semicircular Insertion of POUPART's *Ligament into the Pubis, forming a Portion of the Crural Ring, in the Male.*

a, That part of POUPART's ligament which forms the crural ring.
b, The tendon of the transversalis inserted into the pubis behind the external abdominal ring, and preventing that opening from being seen.

c, *c*, The fascia transversalis, which here separates, to form the internal abdominal ring.

d, The fascia iliaca.

e, The place where the two fasciæ meet, and shut up the under end of the abdomen.

f, The external iliac artery.

g, The epigastric artery, with the corresponding vein.

h, The external iliac vein.

i, The spermatic artery and vein.

k, The vas deferens.

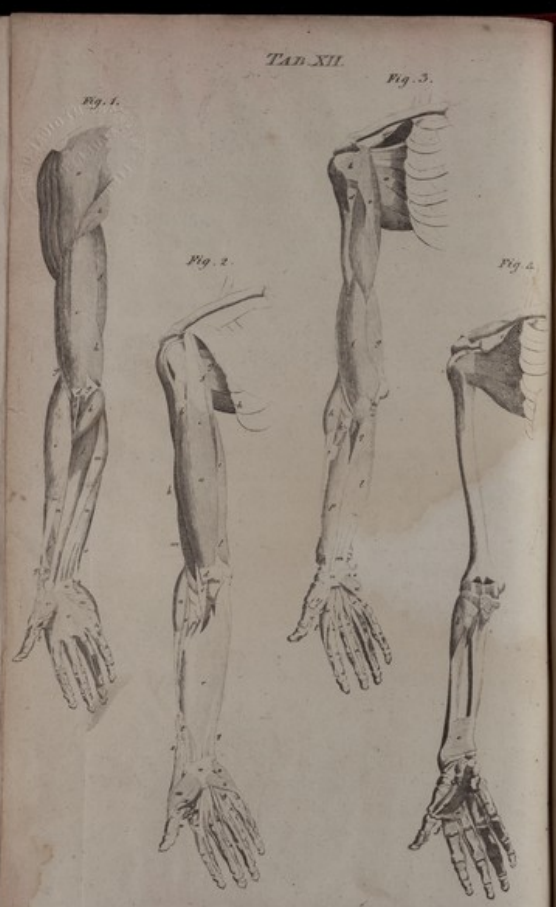


TABLE XII.

REPRESENTS the MUSCLES situated on the Fore Part of the SUPERIOR EXTREMITY.

FIG. 1.

A View of the First Layer of MUSCLES *on the Fore Part of the* SUPERIOR EXTREMITY, *the Integuments and Aponeurosis being removed.*

a, The deltoides.
b, The insertion of the pectoralis major.
c, The biceps flexor cubiti.
d, The aponeurosis of the biceps cut off.
e, The round tendon of the biceps cut off.
f, The long head of the triceps extensor cubiti.
g, *g*, The brachialis internus.
h, The third head of the triceps, called *Brachialis Externus.*
i, The supinator radii longus.
k, The pronator radii teres.
l, The flexor carpi radialis.
m, The palmaris longus.
n, *n*, Part of the flexor digitorum sublimis.
o, The under end of the flexor carpi ulnaris.
p, Part of the flexor longus pollicis.
q, The tendons of the extensores ossis metacarpi et primi internodii pollicis, with their annular ligament.
r, The abductor pollicis, at the outer edge of which is a small portion of the flexor ossis metacarpi pollicis.
s, That portion of the abductor pollicis, called by ALBINUS *Abductor Brevis Alter.*

t, The tendon of the flexor longus pollicis, bound by a ligament.
u, The ligamentum carpi annulare anterius.
v, The aponeurosis palmaris, extending from the annular ligament of the wrist to the transverse ligaments at the roots of the fingers, and the adjacent edges of the metacarpal bones.
w, The palmaris brevis, covering part of the abductor, and flexor parvus minimi digiti.
Upon the fingers are seen the annular ligaments retaining the tendons of the flexor sublimis, and flexor profundus, in their places.

FIG. 2.

The Second Layer of MUSCLES *on the Fore Part of the* SUPERIOR EXTREMITY.

a, The biceps flexor cubiti.
b, Its long head.
c, Its short head.
d, A section of the aponeurotic tendon of the biceps.
e, The round tendon of the biceps.
f, Part of the coraco-brachialis.
g, The subscapularis.
h, The teres major.
i, The long head of the triceps extensor cubiti.
k, Its short head.
l, The brachialis externus of the triceps.
m, *m*, The brachialis internus.
n, The extensor carpi radialis longior.
o, The extensor carpi radialis brevior.
p, The supinator radii brevis.
q, The insertion of the flexor carpi ulnaris.

r, The flexor digitorum sublimis; its tendons dividing near their insertion in the second phalanx of the bones of the fingers, for the passage of the tendons of the flexor profundus.
s, The extensor ossis metacarpi, and extensor primi internodii pollicis.
t, Part of the flexor pollicis longus;
u, Its tendon.
v, The ligamentum carpi annulare.
w, The flexor ossis metacarpi pollicis.
x, The abductor pollicis brevis alter of ALBINUS.
y, Part of the flexor brevis pollicis.
z, Part of the adductor pollicis.
1, The abductor indicis.
2, The adductor minimi digiti.
3, The flexor parvus minimi digiti.
4, 4, The four lumbricales.

FIG. 3.

The Third Layer of MUSCLES *on the Fore Part of the* SUPERIOR EXTREMITY.

a, The subscapularis;
b, Its tendon.
c, The teres major;
d, Its tendon.
e, The coraco-brachialis.
f, The brachialis internus.
g, The brachialis externus of the triceps.
h, The extensor carpi radialis longior.
i, Part of the extensor carpi radialis brevior.
k, The supinator radii brevis.

l, The flexor digitorum profundus.
m, The tendons of that muscle passing under the ligamentum carpi annulare, to be inserted into the third phalanx of the fingers.
n, The ligamentum carpi annulare.
o, *o*, The four lumbricales.
p, The flexor longus pollicis.
q, A slip which it sometimes receives from the inner condyle of the os humeri.
r, The tendon of the flexor longus pollicis inserted into the last joint of the thumb.
s, The flexor brevis pollicis.
t, The interosseous muscle of the fore finger,
u, The adductor minimi digiti.

FIG. 4.

The Fourth Layer of MUSCLES *on the Fore Part of the* SUPERIOR EXTREMITY.

a, The subscapularis.
b, The supinator radii brevis.
c, The pronator radii quadratus.
d, The flexor brevis pollicis, with its insertion into the ossa sesamoidea.
e, The adductor pollicis.
f, *f*, The seven interossei,—the first placed at the outer side of the metacarpal bone of the fore-finger,—the rest of them between the metacarpal bones.

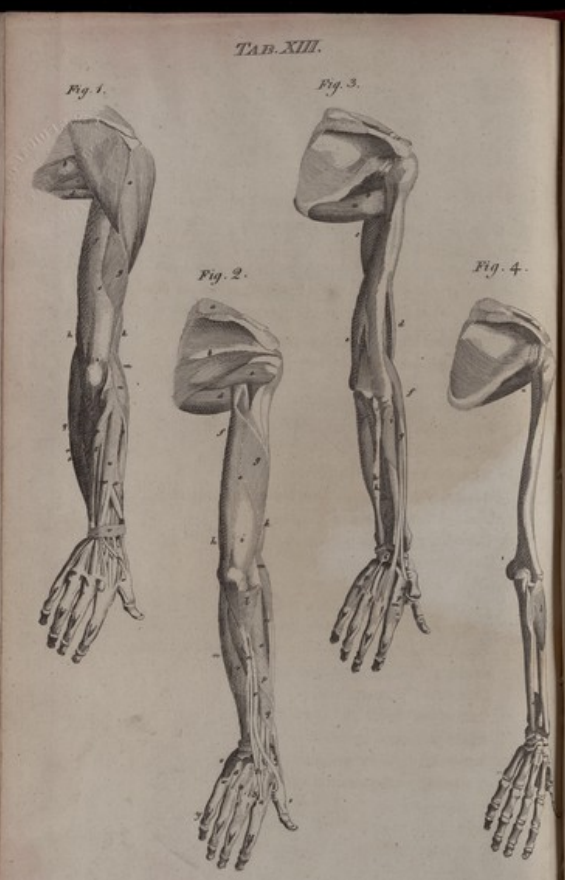


TABLE XIII.

REPRESENTS the MUSCLES on the back part of the SUPERIOR EXTREMITY.

FIG. 1.

A View of the First Layer of MUSCLES *on the Back Part of the* SUPERIOR EXTREMITY.

a, The deltoides, with its insertion into the os humeri.
b, The infra-spinatus.
c, The teres minor.
d, The teres major.
e, The triceps extensor cubiti.
f, The long, and,
g, The short head of the triceps.
h, The third head, called *Brachialis Externus*.
i, The common tendon of the three heads.
k, Part of the brachialis internus.
l, Part of the anconeus.
m, The supinator radii longus.
n, The extensor carpi radialis longior.
o, The extensor carpi radialis brevior.
p, Part of the flexor profundus, which comes from the ulna.
q, Part of the palmaris longus.
r, Part of the flexor digitorum sublimis.
s, The flexor carpi ulnaris.
t, The extensor carpi ulnaris.
u, The extensor digitorum communis, in which are seen,
Its passage under *v*, the ligamentum carpi annulare posterius;
The portion *w*, which it sends to the little finger;

Its flat tendons, running along the metacarpal bones;
The aponeurotic slips, which join these tendons together near the first joint of the fingers;
The tendons upon the back of the fingers, forming broad expansions which cover and adhere to the first and second, and are inserted into the base of the third phalanges; and
The splitting and rejoining of the tendons, between the first and second phalanges, for facilitating the motion of the joints.

x, The extensor ossis metacarpi, and, *y*, The extensor primi internodii pollicis, with their annular ligament.
z, The tendon of the extensor secundi internodii pollicis.

FIG. 2.

The Second Layer of MUSCLES *on the Back Part of the* SUPERIOR EXTREMITY.

a, The supra-spinatus.
b, The infra-spinatus.
c, The teres minor.
d, The teres major.
e, The triceps extensor cubiti.
f, Its long head.
g, Its short head.
h, Part of the third head, named *Brachialis Externus*.
i, The common tendon of the triceps inserted into the olecranon.
k, Part of the brachialis internus.
l, The anconeus.
m, The extensor carpi radialis longior.
n, The extensor carpi radialis brevior.

o, The supinator radii brevis.
p, The extensor ossis metacarpi pollicis.
q, The extensor primi internodii pollicis.
r, The extensor secundi internodii pollicis.
, The conjoined tendons of the three extensors of the thumb.
t, The indicator.
u, The flexor digitorum profundus.
v, The flexor carpi ulnaris.
w, A small portion of the flexor sublimis.
x, *x*, The cut tendons of the extensor digitorum communis.
y, *y*, The tendinous slips of the extensor communis, fixed to the second phalanx.
z, The adductor pollicis.
1, The abductor indicis.
2, The abductor minimi digiti.
3, 4, 5, The posterior interossei, consisting of, 3, The prior medii digiti, 4, The posterior medii digiti, and, 5, The posterior annularis.

FIG. 3.

The Third Layer of MUSCLES *upon the back part of the* SUPERIOR EXTREMITY.

a, The teres major.
b, Part of the subscapularis.
c, Part of the coraco-brachialis.
d, Part of the brachialis internus.
e, The brachialis externus.
f, The extensor carpi radialis longior.
g, The extensor carpi radialis brevior.

h, The flexor profundus perforans.
i, The supinator radii brevis.
k, Part of the flexor longus pollicis.
l, The pronator radii quadratus.
m, *m*, The cut tendons of the extensor digitorum.
n, The flexor brevis pollicis.
o, The adductor pollicis.
p, *p*, The interossei interni, with portions of the interossei externi, the rest of the interossei externi being cut off.

At the lateral part of the roots of the fingers, in this and the two former figures, are seen the joining of the tendons of the extensor digitorum, and of the lumbricales and interossei.

FIG. 4.

The Fourth Layer of MUSCLES *on the Back Part of the* SUPERIOR EXTREMITY.

a, The subscapularis.
b, The supinator radii brevis.
c, The pronator radii quadratus.
d, The flexor brevis pollicis.
e, The adductor pollicis.

TABLE XIV.

REPRESENTS the MUSCLES on the Fore Part of the INFERIOR EXTREMITY.

FIG. 1.

The First Layer of MUSCLES *on the Fore Part of the* INFERIOR EXTREMITY.

a, The tensor vaginæ femoris.
b, The anterior edge of the gluteus medius.
c, The under end of the iliacus internus, and of,
d, The psoas magnus.
e, The pectinalis.
f, The adductor longus femoris.
g, The gracilis.
h, The sartorius.
i, The rectus femoris.
k, The vastus externus.
l, The vastus internus.
m, The ligament common to the extensors of the leg, fixed to the patella.
n, The ligament fixing the patella to the tibia.
o, The tendons of the sartorius, gracilis, and semi-membranosus.
p, The under end of the biceps flexor cruris.
q, The tibialis anticus;
r, Its tendon.
s, The peroneus longus.
t, The extensor longus digitorum pedis.
u, The tendons of the extensor longus.

v, The extensor proprius pollicis.
w, The gastrocnemius externus.
x, *x*, The gastrocnemius internus.
y, The flexor longus digitorum pedis.
z, The tibialis posticus.
1, The tendo Achillis, and tendon of the plantaris.
2, The upper and under portions of the ligamentum tarsi annulare.
3, Ligaments retaining the tendons at the inner ankle.
4, The abductor pollicis.

FIG. 2.

The Second Layer of MUSCLES *on the Fore Part of the* INFERIOR EXTREMITY.

a, The under end of the iliacus internus.
b, The under end of the psoas magnus.
c, The pectinalis.
d, The cut end of the rectus femoris.
e, The anterior edge of the gluteus medius.
f, The gluteus minimus.
g, The cruralis, with its tendinous fascia.
h, The vastus internus.
i, The vastus externus.
k, The cut edge of the rectus fixed to the patella.
l, The adductor longus femoris.
m, A small portion of the adductor magnus.
n, The gracilis.
o, The tendons of the gracilis and semi-tendinosus.
p, The tendon of the biceps flexor cruris.
q, The peroneus longus.
r, The peroneus brevis.

s, The extensor longus digitorum pedis;
t, The tendons of that muscle.
u, The peroneus tertius.
v, The extensor proprius pollicis.
w, Its tendon.
x, A branch of that tendon not constant.
y, *y*, The edges of the gastrocnemius internus.
z, The edge of the flexor longus digitorum pedis.
1, The tendons of the tibialis posticus and flexor longus digitorum.
2, Part of the flexor brevis digitorum.

FIG. 3.

The Third Layer of MUSCLES *on the Fore Part of the* INFERIOR EXTREMITY.

a, The gluteus minimus.
b, The iliacus internus.
c, The psoas magnus.
d, The obturator externus.
e, The adductor brevis.
f, *f*, The adductor magnus.
g, The gracilis.
h, The semi-membranosus, with its insertion in the tibia.
i, The short head of the biceps flexor cruris.
k, The peroneus longus.
l, The peroneus brevis.
m, *m*, The tibialis posticus, the interosseous ligament being removed.
n, The flexor longus digitorum pedis.
o, The tendon of the tibialis posticus.
p, The tendon of the flexor longus digitorum.

q, The tendon of the flexor longus pollicis pedis.
r, The extensor brevis digitorum pedis.

FIG. 4.

The Fourth Layer of MUSCLES *on the fore Part of the* INFERIOR EXTREMITY.

a, The psoas magnus.
b, The iliacus internus.
c, The obturator externus.
d, *d*, The adductor magnus.
e, The tibialis posticus;
f, Its tendon.
g, The peroneus brevis.
h, The interossei externi.

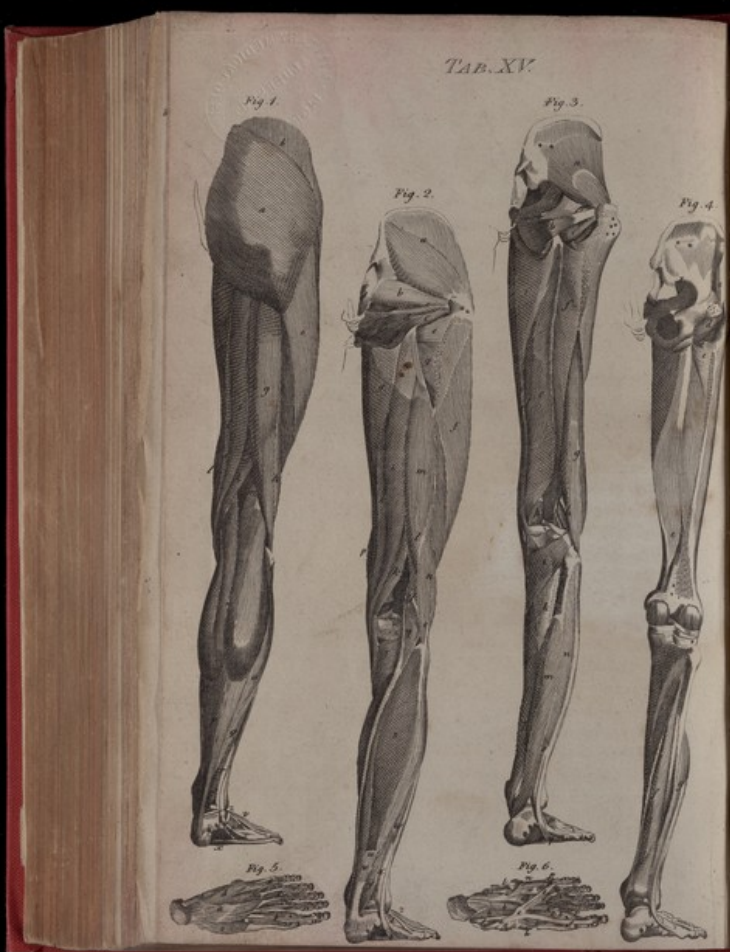


TABLE XV.

REPRESENTS the MUSCLES situated on the Back Part of the INFERIOR EXTREMITY.

FIG. 1.

A View of the First Layer of MUSCLES *on the Back Part of the* INFERIOR EXTREMITY.

a, The gluteus maximus.
b, Part of the gluteus medius.
c, The vastus externus.
d, Part of the adductor magnus femoris.
e, The gracilis.
f, Part of the sartorius.
g, The long head of the biceps flexor cruris;
h, Its short head.
i, The semi-tendinosus.
k, The semi-membranosus.
l, Part of the vastus internus.
m, The edge of the plantaris.
n, The gastrocnemius externus.
o, *o*, The edge of the gastrocnemius internus.
p, The tendo Achillis.
q, The peroneus longus.
r, The peroneus brevis.
s, The flexor longus pollicis pedis.
t, The tendon of the peroneus brevis.
u, The tendon of the peroneus longus, in its passage to the sole.

v, The tendons of the extensor longus digitorum pedis.
w, The tendon of the peroneus tertius.
x, The abductor minimi digiti pedis.
y, A ligament common to the long and short peronei muscles, and one proper to each of them.
z, The ligamentum tarsi annulare.

FIG. 2.

The Second Layer of MUSCLES *on the Back Part of the* INFERIOR EXTREMITY.

a, The gluteus medius.
b, The pyriformis.
c, The gemini.
d, The tendon of the obturator internus passing between the gemini.
e, The quadratus femoris.
f, The vastus externus.
g, The adductor magnus femoris.
h, The semi-tendinosus.
i, The gracilis.
k, The semi-membranosus.
l, The biceps flexor cruris.
m, The long head of the biceps.
n, The short head.
o, The common tendon of the two heads.
p, Part of the vastus internus.
q, *q*, The cut heads of the gastrocnemius externus.
r, The popliteus.
s, The soleus.
t, The plantaris.
u, The cut tendon of the gastrocnemius externus.

v, The tendo Achillis, with the tendon of the plantaris adhering to it.
w, The peroneus longus.
x, The peroneus brevis.
y, The flexor pollicis longus.
z, The tendons of the extensor digitorum longus.
1, The extensor brevis digitorum.
2, The flexor brevis digitorum.

FIG. 3.

The Third Layer of MUSCLES *on the Back Part of the* INFERIOR EXTREMITY.

a, The gluteus minimus.
b, The obturator internus.
c, The tendon of the obturator externus.
d, The gracilis.
e, The semi-membranosus.
f, *f*, The adductor magnus femoris.
g, The short head of the biceps.
h, *h*, The cut heads of the gastrocnemius externus, with a view of the semilunar cartilages.
i, The popliteus.
k, The tibialis posticus.
l, The flexor longus digitorum pedis.
m, The flexor longus pollicis pedis.
n, The peroneus longus, with the passage of its tendon to the sole.
o, The peroneus brevis.
p, The extensor brevis digitorum pedis.
q, The flexor digitorum accessorius.

FIG. 4.

The Fourth Layer of MUSCLES *on the Back Part of the* INFERIOR EXTREMITY.

a, Part of the iliacus internus.
b, Part of the psoas magnus.
c, Their insertion into the trochanter minor.
d, The obturator externus.
e, *e*, The adductor magnus femoris.
f, The tibialis posticus.
g, The peroneus brevis, with the insertion of its tendon.

FIG. 5.

Represents the First Layer of MUSCLES *on the Sole of the Foot, after removing the Common Integuments, the Aponeurosis Plantaris, and the Vaginal Ligaments of the Toes.*

a, The flexor brevis digitorum, the tendons of which are perforated by the tendons of the flexor longus, and inserted into the second phalanx of the four small toes.
b, The tendon of the flexor longus pollicis, at the sides of which the flexor brevis pollicis appears.
c, The adductor pollicis.
d, *d*, The abductor minimi digiti.
e, *e*, The transversalis pedis.

FIG. 6.

The MUSCLES *which appear in the Sole, after those represented in the former Figure have been removed.*

a, The tendon of the flexor longus digitorum.
b, *b*, The flexor digitorum accessorius, with its insertion into the tendon of the flexor longus digitorum.
c, The connexion of the flexor longus digitorum and flexor longus pollicis.
d, *d*, The insertion of the tendons of the flexor longus digitorum into the last phalanx of the four small toes.
e, *e*, *e*, *e*, The four lumbricales.
f, *f*, The tendon of the flexor longus pollicis.
g, The insertion of the tibialis posticus.
h, The insertion of the tibialis anticus.
i, *i*, The two portions of the flexor brevis pollicis.
k, A small portion of the adductor pollicis.
l, The insertion of the peroneus brevis.
m, The tendon of the peroneus longus passing to the sole.
n, The flexor brevis minimi digiti.
o, *o*, Two of the interossei, the insertions of which, and of the other interossei, are seen at the lateral parts of the roots of the toes.
p, *p*, The transversalis pedis.

DIFFERENT KINDS

OF

CONNEXION OF BONES.

Synarthrosis, Or Connexion without intermediate Substance.	*Suture*, Like a Seam.	The Bones of the Cranium, and greater part of those of the Upper Jaw with each other.
	Gomphosis, Like a Nail in a Board.	The Teeth in the Alveoli.
	Schindelysis, Or *Furrowing*.	Bones of the Septum Narium to each other.
Symphysis, Or Connexion by intermediate Substance.	*Synchondrosis*, Or Connexion by Cartilage.	The Bodies of the Vertebræ to each other: The Ribs to the Sternum: The Ossa Innominata to the Os Sacrum, or to each other.
	Syndesmosis, Or Connexion by Ligament.	The Lower Jaw and Os Hyoides to the Head: The Ribs to the Spine: The Processes of the Vertebræ, and also the Bones of the Extremities, to each other.

OF THE SKELETON.

THOUGH the term *Skeleton* be applied to a variety of Substances, yet, in Anatomy, it is always understood to signify the Bones of Animals, connected together in their natural situation, after the soft parts of the Body in general are removed.

It is termed a *Natural Skeleton*, when the Bones are joined by their own Ligaments;

And an *Artificial Skeleton*, when joined by Wire, &c.

Small Subjects, and the Bones of those which are not fully ossified, are most conveniently prepared in the first way; while the Bones of large Adult Animals are more readily cleaned when single, and are easily restored to their proper places.

In viewing the Bones in their natural situation in the Skeleton, scarcely any one of them is observed to be placed in a perpendicular direction to another; yet in an erect posture, a perpendicular line from their common centre of gravity falls in the middle of their common base. On this account, the Body is found to be as firmly supported, as if the axis of all the Bones had been a straight line, perpendicular to the horizon, and much greater quickness, ease, and strength, are given to the Body, in several of its most necessary motions.

DIFFERENT KINDS OF MOTION.

ARTHRODIA; Where the flat ends of Bones are opposed to each other with little motion.		Between the Clavicle and Scapula. The Bones in the second row of the Carpus. The Carpus and Metacarpus. The Tibia and Fibula. The greater number of Bones in the Tarsus. The Tarsus and Metatarsus.
GINGLIMUS; The Bones mutually receiving each other, and the Ligaments admitting of a hinge-like motion.	*Angular,* One Bone, in moving, forming an angle with another.	The Lower Jaw and Head. The Joint of the Elbow. The first and second Joints of the Thumb, and second and third of the Fingers. The Joint of the Knee. The Ankle. The two last Joints of the Toes.
	Lateral or Circular.	Between the first Vertebra and Processus Dentatus of the second. Between the Radius and Ulna.
	Compound.	Between the Occipital Bone and Atlas. Between the different Vertebræ. And between the Ribs and Vertebræ.
ENARTHROSIS, Or Ball and Socket, the Ligaments allowing motion in all directions.		Inner end of the Clavicle. Head of the Os Humeri. Between the Fore-arm and Wrist, and between the two rows of the Carpal Bones. At the root of the Metacarpal Bone of the Thumb, and root of the first Phalanx of the Fingers. At the head of the Thigh-bone. Between the Astragalus and Os Naviculare, and at the root of the first Phalanx of the Toes.

The Bones are in general similar to each other in the opposite sides of the Skeleton, though in many instances there is some variation.

The Human Skeleton is generally divided into *Head*, *Trunk*, *Superior* and *Inferior Extremities*.

CHEMISTRY AND PHYSICS

IN RELATION TO

PHYSIOLOGY AND PATHOLOGY.

BY

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CHEMISTRY AND PHYSICS

IN RELATION TO

PHYSIOLOGY AND PATHOLOGY.

DEVELOPMENT OF THE NATURAL SCIENCES.

The history of science teaches us, that every branch of physics comprised at its commencement nothing beyond a series of observations and experiments, which had no obvious connection with each other.

SPECIAL LAWS OF NATURE.

All advances in science were dependant upon the discovery of new facts, by which two or more previously observed experiments were made to bear upon each other. The first step gained was the deduction of *special* laws, which embraced in themselves the connection of a certain number

of natural phenomena; the next was the attainment of *general* laws, or what was the same thing, of certain expressions of the dependence or connection of a larger, or smaller series of experiments.

GENERAL LAWS OF NATURE.

Many branches of physics as mechanics, hydrostatics, optics, acoustics, the theory of heat, &c., have been elevated to the rank of abstract sciences, in consequence of their permitting all known cases of the phenomena of motion, air, sound, heat, &c., to be traced through a series of syllogisms to certain truths, or to a very small number of undoubted facts, which not only unite together those already known, but also those yet remaining to be discovered; so that a new isolated series of conclusions is not requisite to the explanation of new phenomena, or experiments.

If we can regard it as undoubted that not only the phenomena of inanimate nature, but also, those of animal and vegetable life are peculiar to themselves, stand in certain relations to each other, and depend upon certain causes; and if further, it be true that it is only by a knowledge of these causes or conditions that we can gain a clear insight into the existence of organic processes,

then must the investigation of the reciprocal dependence and the conditions of the phenomena of life, be regarded as the most important department of physiology.

The explanation of many natural phenomena, requires, in most cases, nothing more than an acquaintance with the relation of dependence in which they stand, one to the other.

The knowledge of these relations is attainable in every branch of natural investigation by the extension of experience, and by correctness of observation; and there can be no question that, at some future time, as chemistry loses the character of an experimental art, so will physiology be capable of ranking as a deductive science.

COURSE OF INVESTIGATION.

If it follow, according to the course of natural investigation, that general laws must be preceded by those that are merely special, and it be granted that a just conception of life cannot be acquired without a thorough knowledge of the organism in all its parts, both with reference to the functions of individual organs in themselves, and their mutual dependence, including the consideration of the relation of form to organic matter; then it will not be denied that we are still most widely removed from the possession of a general formula, embracing the comprehension of life, and the

knowledge of the causes and connections existing in natural phenomena. So remote is this object, that there are many who still regard the probability, or even possibility of the attainment of such general laws in physiology, as purely chimerical; while most persons are unable to distinguish psychical from corporeal phenomena, or the idea of vital power from the form of living organs.

PRECONCEIVED VIEWS, AN IMPEDIMENT TO INVESTIGATION.

A man even of the most cultivated mind cannot wholly emancipate himself from the dominion of those laws, on which his powers of comprehension are dependant. If the daily experience of a prolonged period constantly show him two phenomena or facts, apparently closely connected together, if he learn that, for centuries, they have been considered inseparable, and if he have never, either by accident or design, been led to consider each individually, he becomes gradually incapable, in spite of the greatest exertion to the contrary, of considering them apart, until at length his mind refuses to admit the very assumption of any difference existing in the nature of the phenomena observed.

Innumerable instances testify that even the most accurate observers of their age have regarded

certain facts or representations as impossible, simply because their power of comprehension was unable to receive them; while their successors have not only comprehended them, but what is far more, have universally received them as incontestible truths.

Men of the clearest discernment, who were raised far above ordinary ideas, were yet unable to understand that the force of gravity acts with an upward instead of a downward tendency, or that the sun from its vast distance could exercise any influence upon the earth, or the earth upon the moon. Even the great Leibnitz rejected the Newtonian theory, because he could not regard it as possible that the planets could maintain a motion in a curved line around one common centre, without the agency of some continuously acting mechanism; since according to him in the absence of a propelling power, the body must fly off at a tangent to its orbit.

Starting from the general proposition that a body can exercise no influence upon a point, with which it is not in contact, the Newtonian theory of gravitation was rejected; and the fact now become familiar to the mere schoolboy, that the power of gravitation is active at boundless distances without any influencing material agent, appeared even to men of the noblest intellect to contain so great a contradiction, that rather than receive it, they maintained

the probability of the strange, and unfounded creations of their own fancy.

There are many theories in mechanics and physics, which, although we know to have been regarded as the great discoveries of their age, and the results of the most patient and laborious investigations, appear to us now so true and obvious, that if we did not possess the history of their gradual development, it would seem incredible that a doubt of their truth could ever have been entertained by any individual in any age.

The simple position that a body once put in motion, could traverse space, for ever pursuing with unvarying velocity the same direction, appeared so opposite to common and evident experience that the recognition and establishment of its truth met for a long period with the greatest opposition.

That two chemico-active bodies can form a combination of definite unchangeable properties, through their union in indefinite or unlimited proportions, appears, even to our sound powers of comprehension to be untenable.

The comprehensive has, as we have shown, nothing to do with the apparent, but is dependant upon the condition of our mental development. If the uniting link that associates a fact with the usual course of our ideas be wanting, the fact itself will appear devoid of truth and compre-

hensibility. This is one of the greatest impediments that stands in the way of the application of chemistry to psychology, and of a simple consideration of chemical discoveries on the part of many physiologists ; and if to this be associated, as in pathology, the assumption of facts on experience, the correctness of which has no other foundation than the opinion of many centuries, and if, in these branches of science, the mode of arriving at conclusions and deductions be not changed, there is no hope as yet, that chemistry, with all her advances, will ever be able to render any essential aid to physiology and pathology ; while it is alike impossible for either of these sciences to attain to any scientific basis, without the co-operation of chemistry and physics. While no one doubts the necessity of this co-operation, there is little unity of sentiment regarding its practical application.

PHYSIOLOGY AS A DEDUCTIVE SCIENCE.

The opinion that every empirical science, including physiology, may in the course of time acquire the character of a deductive science seems to require no confirmation ; and it must be immaterial whether this position be attained by borrowing from other sciences : as for instance, in the case of astronomy, which owes its scientific basis to its partial incorporation with the theory of motion.

INVESTIGATION PURSUED ACCORDING TO PHYSIOLOGICAL LAWS.

If we bear in mind that, as no occurrence in the world, so also no phenomenon of nature either in the animal or vegetable kingdom, can appear without standing in relation to, or as the immediate result of another, that has preceded it; (as the present condition of a plant or animal is dependant upon certain pre-existing conditions;) it is clear, that if all the causes that affect one condition and their influence upon time and space, with their properties, are known to us, we shall be able to declare what other condition will succeed the former one. The expression of these conditions or relations, is what we term a natural law.

THE DIFFERENCE BETWEEN THE CHEMISTRY OF THE PRESENT DAY AND THAT OF AN EARLIER AGE.

No one who is conversant with the history of the development of chemistry, and of many other branches of physics will deny that the main reason of the advance of these sciences rests upon the gradually confirmed conviction that every natural phenomenon has more than one requirement, every effect more than one cause, and that it is the simple inquiry into the plurality of these conditions, and the separation of effects which distinguish the chemistry of the present day from that of former times. A speedy termination was put in the period of phlogosis to all research by assuming principles of dryness and humidity, heat and cold, combustibility, acidity, volatilization, &c.; ascribing a special essence to every property, the explanation of which was included in the simple description of the phenomenon.

The fluctuation in weight which bodies manifest on being submitted to chemical processes, was regarded as a property of matter similar to the effervescence of limestone, when acted upon by acids. There was a theory for the respective phenomena of combustion and calcination, although the relations of weight were not regarded as in the province of earlier chemistry. It was left to physiologists to explain how a body could have an increase of weight after losing one of its constituents; and further, how under any circumstance, a body can show a fluctuation in weight. The increase of weight in calcination was an accidental property, peculiar as it was supposed, together with many others, to metals.

POINT OF VIEW ASSUMED BY MANY PHYSIOLOGISTS OF THE PRESENT DAY.

Many physiologists and pathologists still regard the conception of vital processes and phenomena, from the same point of view as the phlogistics; they ascribe the effects of the nervous system to a

nervous force; while vegetation, irritability, sensibility, action and reaction, simple effects of motion or resistance, causes of the formation and the change of form, which are included in the expression of typical forces, are all regarded as *entities*, and assume the place occupied in older chemistry by the essences.

CONFUSION OF EFFECT AND CAUSE.

The most common phenomena have been incorporated in the minds of many physiologists as actual capacities—properties—which they have falsely been led to explain by especial reasons, different from the others known; thus the terms endosmosis, and exosmosis have been applied to the return to a state of equilibrium of two fluids differing in their nature, or of two unequally dissolved substances, separated by an animal membrane; and thus we continue to treat names as if they were facts, embracing an explanation of the process, while this phenomenon is nothing more than a filtration, differing so far from other forms, that the permeation is dependant not upon pressure, but upon attraction, disposition, or affinity.

To this mode of observation was added the equally great error of conceiving that causes must be of a similar nature to their results, and that like must call forth like. Thus, the cause of combustion was thought to be something combustible, and the cause of acid, something acid; the caustic property of burnt lime was derived from a caustic, which suffered itself to be transferred from one body to the other, from the lime, for instance, to the so-called mild alkalies; the presence of a primitive alkali was pre-supposed in the alcalies; an *acidum universale* in acids; a primitive salt in salts; while analogous bodies were varieties of *one substance*.

FALSE EXPLANATION OF PHYSICAL PROPERTIES.

Many physical properties of bodies were explained by the physical character of their most minute parts; thus, for instance, a sharp taste was ascribed to sharp particles. Lemery's * view that the smallest atoms of an acid were lance-shaped, and that the atoms of alkalies were porous like a sponge, met with great approval, for it seemed to confirm their mutual power of neutralization; and the fact of ammonia precipitating gold in its solution was a convincing proof to the chemists of that day, of the capability they ascribed to ammonia of abrading the lance-like points of the atoms; it acted, to use Lemery's words, like the cudgel thrown by a boy against a nut tree laden with fruit.

* Lemery's opinions were first promulgated in his *Cours de Chimie*, published in 1675. An English translation entitled, *A course of Chymistry, containing an easy Method, &c.*, passed through four editions, the last bearing the date of 1720.

Thus certain substances which possess an astringent or cooling flavour, were supposed to exercise an astringent or cooling effect upon the living body; and any alcoholic drink, which may be termed strong according to the common mode of speech, was admitted as a tonic among other remedial agents.

It is an error to suppose that this mode of considering natural phenomena belongs to a very remote period, as will be seen from the following extracts drawn from Mulder's "Chemistry of vegetable and animal Physiology."* "We, therefore, rightly conclude," he observes, "that in sulphur, selenium, chromium, and manganese, similar forces exist; and thus we arrive at the idea that the chemical relations of these elements are not dependant upon their matter, but upon the analogous forces, by which their molecules are governed. Thus the idea of the matter of sulphur is associated with somewhat of the idea of force, and of the same force which operates in selenium also—which operates not only in forming combinations, but in contributing likewise to the formation of the whole character of the compound substances produced. We remark the effects of this force which exists in sulphur, selenium, &c., even in more

* "Versuche einer allgemeinen physiologischen Chemie." Braunschweig, 1844, p. 37, of the first edition.

complicated compounds than those to which we have referred."

The excellent investigations of Mitscherlich and Kopp upon isomorphism, have not been able, as we see, to eradicate this mode of observation.

EVERY PHENOMENON OF NATURE IS DEPENDANT ON MORE THAN ONE CAUSE.

The truth of a number of opinions or views, whether justly or unjustly, is liable to be doubted; but a phenomenon, an effect, cognizable to the sound senses of the most different persons, everywhere, and at all times, cannot be doubted, excepting inasmuch as the causes which bring about certain results may not be fully known. But this cause can never be supplied by the imagination, in the department of natural investigation; for we know that one and the same effect, as, for instance, a mechanical motion, a blister upon the skin, or the contraction of a muscle, may be brought about by different causes, and that one and the same cause may bring about a variety of effects.

CHEMICAL COMBINATION.

We know that the simple process of chemical combination is dependant upon at least three causes or conditions, which must stand in a certain relation to each other, if the combination is to

be formed, and that affinity, the force of cohesion, and heat, have an equal share in the process.

DIFFERENT EFFECTS OF HEAT.

We know further that when a given quantity of heat expands a solid body, and forces its minutest parts to separate from each other, a double or triple quantity will entirely change the properties of the body, and that a further alteration occurs in these properties if the amount of heat that is communicated exceed a certain degree.

It is perfectly certain that expansion, liquefaction, and transition into the gaseous form are dependant upon causes, identical in their nature, but that the effects produced are by no means proportional to the causes; the reason of this has been justly sought in the reaction or resistance of some other cause, and our idea of the existence of the power of cohesion thus acquires a more scientific basis.

The same degree of heat, which is a condition of the combination of the oxygen of the air with mercury, produces the opposite effect—the decomposition of the oxide of mercury into mercury and oxygen, if the temperature be raised a few degrees.

By a simple process of oxidation we derive acetic acid from alcohol: we obtain this acid from the oxidation of salicylite of potash; we may also exhibit it from wood, sugar, and starch, by the mere application of heat and the exclusion of

the oxygen of the atmosphere: in all these cases the product yielded is the same; but the conditions of its formation are extremely different.

THE SEPARATION OF VITAL EFFECTS, AND THE CHIEF REQUISITES THERETO.

If it be true that physiology can only attain to a scientific basis by the investigation of the plurality of conditions, on which the phenomena of life depend; and if it be granted that this can only be attained by a consideration and separation of vital effects, and the conditions to which they give rise; it is evident that since a number of causes have, or may have, an influence upon these effects, the physiologist ought to possess an intimate knowledge of all the forces and causes which may bring about changes of form and character in matter; since, without this, he would be unable to separate true effects from those which might be erroneously ascribed to the cause, and which, perhaps, have nothing in common with indications of gravity, affinity, &c.

CONTINUED DISREGARD OF THESE PRINCIPLES.

No one can deny that these principles are applied in the investigations of pathology at the present day, and the difference between the method of inquiry now pursued from that in use in the earlier stages of philosophical science is certainly very great, although the influence of the older system is

not quite exterminated, at least as far as Germany is concerned. In spite of our acknowledgment of the accuracy of the principles of natural investigation, we are but too ready to throw off its shackles, and suffer our unfettered thoughts wherever the way is not clear, to erect a barrier of errors before the gates of knowledge. Favourite antitheses and paraphrases still play a chief part in all explanations, robbing common facts and conditions of the simplicity and perspicuity of which they are capable. The deficiency here rests not with the principles, but in the want of their due application.

EXAMPLES.

A few extracts from the writings of a distinguished pathologist of the present day will suffice to justify these remarks, and to show the influence that the older mode of investigation still exercises upon the present; they will also tend to demonstrate how impossible it is to arrive at correct conclusions by starting from indefinite ideas, and how small is the acquisition of scientific knowledge with reference to chemical and physical sciences, even in the most intellectual men.

INDEFINITE IDEAS OF IRRITABILITY AND IRRITANTS.

Many external causes, as the atmosphere, heat, electricity, magnetism, chemical agents, mechanical pressure, friction, &c., exercise certain effects upon the whole, or parts of the organism; in some cases these are similar, in others different.

These effects are dependant upon a certain number of those active causes, which exert either an external or internal influence upon the organism. The existence of these causes is capable of being defined and measured by the qualitative and quantitative difference in the effects produced by external causes which indicate a changed condition. The active forces in the organism are, accordingly, appreciable by the investigation of those effects which are qualitatively and quantitatively modified by every external cause. The method pursued by modern pathology is exactly the reverse of the principles advanced, as is proved by a few passages from the celebrated work of Henle, "On Pathological Investigations."* "Irritability is," according to Henle, "everything which, in acting upon organic matter, alters its form and composition, and consequently its function," p. 223. Far from regarding the separation of causes and their effects as the indispensable auxiliaries of knowledge, the author here, as we perceive, includes all imaginable causes of the changes in the form and properties of the organic body, under the term irritability; and, in the expo-

* Pathologische Untersuchungen, Berlin, 1840.

sition of conditions, this word plays the part of an entity, although this does not comprehend the mode of action of electricity, heat, light, magnetism, or chemical forces, but simply a small part of the action of each of these agents. We need only apply to the following, the definition given above by the author, to perceive how little science gains by such a method.

" Irritability alters the nervous fibre and its relations to the blood; but if it do not wholly decompose it, the metamorphosis of matter continues, and is perhaps even increased by the irritation, &c."

FALSE ANALOGIES.

No one after this will wonder to find, at p. 221 of the same work, an hypothesis regarding the mode of action of irritants, although there is not an allusion to the mode of action of any thing, or cause, which in acting upon organic matter changes its form and composition.

TYPICAL FORCE—AN INDEFINITE IDEA.

It cannot surely be correct to regard certain vital indications, (as, for instance, the development of the organism from the egg or germ, or the renewal of original forms,) as dependant on a certain typical power in the organism, since this expression is nothing but a mere verbal illustration.

Henle, at page 129 of his " Rationelle Pathologie," admits that the perpetual typical laws, which he has spoken of, are inadequate to explain how the salamander can regenerate a whole limb, while in the kindred frog regeneration is limited to a few tissues, as in the higher animals; and regards these indications as proving nothing more than the fact that they are such. To comprehend an explanation, pre-supposes a knowledge of the laws on which it depends, and the comprehension of the law is inseparable from the knowledge of qualitative or quantitative relations.

By way of rough illustration, we may compare the healthy organism in many respects to a large Transatlantic steam-boat; the latter consumes at every moment of its passage oxygen and fuel, which are again given off in the form of carbonic acid, water, soot, or smoke; it encloses sources of heat and power, which call forth motor effects, and minister to the wants of the crew, by preparing food for their use. If a sail be rent, there is one at hand to repair it; if a leak be sprung, the joiner is there to arrest the damage; while a number of men are ever active in keeping up the original condition of the vessel, and maintaining her speed; and so it is with the living body, which likewise has *its* smiths, and joiners, and other artificers. Let it then be our duty to study and recognize its mutual relations.

LIGHT CONSIDERED AS AN IRRITANT.

It is impossible to arrive at the comprehension of a subject, if, as is done by some pathologists, a term—such as an irritant—be made to include alike active causes, which change the form and composition of organic bodies, and such as light, sound, &c., which do not possess this capacity. Light is in itself a motor appearance, and as such is perceived by the eye, exciting in the optic nerve a motion which is transferred to the sensorium; the motion once begun is continued, as the tones of a flute are prolonged in the air, or a string in the piano produces tones. The impression of light is motion itself, but this motion calls forth no change in the form and composition of the eye or brain, unless new causes are superadded; and among such we may rank the labour of thought, by which the impression is converted to a conscious perception, awakening, in its turn, conceptions and ideas.

No one would seriously maintain that a piece of white paper could, by its reflected light, bring about a change in the form and composition of the brain, since an opposite effect must then necessarily be ascribed to a piece of black paper, from which no light is given forth; but the two combined, the black and white, when in the form of

letters in a book, awaken the most manifold feelings, conceptions, and images; and it is by means of these, and not of light, that an influence is exercised upon the properties of the brain.

SOUND AS AN IRRITANT.

The observations which we have made regarding light, apply in every respect to sound; the vibrations of the air-wave are continued through the organs of hearing, and communicated to the auditory nerve. The motion imparted to the membrane of the tympanum alters its form and composition as little as those of the molecules, which have received a like motion from it. As the eye wearies in a picture gallery, although it receives less light in the same period than it would in the open air, so it is also with the ear.

FALSE IDEA OF REACTION.

The false ideas conveyed by a mere verbal term, give occasion to constant misconception. This is the case with the word reaction, which merely means an opposing agency, but is used in physiology in a very different sense. We say that the glands react upon an irritant, if the secreting power be increased by any external cause, as is perceptible in a number of the secretions at the time of applying an irritant. One peculiarity of organic bodies is, that the increased activity of the

glands does not continue, even if the irritation be kept up; although it lies in the nature of things that the secretion must cease if there is no matter present capable of affording it, and that it will be again augmented in proportion to the new supply. The action of the irritant is not an action upon the glands, but upon the cause, which equally produces the secretion, so that, in consequence of the irritation, more matter is secreted at one period than at another.

Thus, in the tail of a lizard, a metamorphosis and renewal of its molecules is continually going on, and when the tail is cut off, and the cut surfaces are separated, the governing forces act against the separation of the parts by the knife, but no counter-action of vital force is exhibited upon the knife. The cut surface of the severed piece of tail is not renewed, but the one which is connected with the organism grows, not in consequence of a reaction, but owing to the continuance of the causes which effect the renewal. The body of the lizard is not integrally renewed, when nutrition is absent. If the tail grow again, the other parts of the body lose a corresponding weight and volume.

The organic body resembles other bodies in all its conditions; thus many effects which have been called forth continue, even when the causes which gave rise to them have ceased to act; others are balanced, if the active cause of the disturbance

cease, because within the body itself there are forces or causes of resistance at work which uninterruptedly make themselves felt.

VERBAL EXPLANATION NO ADVANCE.

The very small amount of knowledge we have gained from that period of physiology, when it was looked upon as a mere natural philosophy, sufficiently proves that the most comprehensive description of a function of the organic body, as the process of respiration or digestion, or a condition of disease, is not sufficient to impart a knowledge of it, and that the most ingenious combinations contribute nothing to our advance, if they be not sustained by a close and accurate inquiry into facts already observed, and such as yet remain to be brought to light. The imaginative faculty alone does not justify us in losing sight of the original point of view, nor in assuming that a consecutive course of views and opinions is an advance in science, since such a mode of proceeding can only be compared to that of a man revolving in a circle, and seeking to gain the greater number of different points of view. Not that these are immaterial, for they indicate the direction in which we must apply our powers; but the mere *description* of a condition, as for instance, of a catarrh being an inflammation of the mucus

membrane of the nose, must not be regarded as an explanation, or as the termination to our inquiry. A new expression for catarrh, as arising from some active injury to the cutaneous nerves, is no actual gain, but a mere ideal representation.

EXERCISE OF THE IMAGINATION WITH REFERENCE TO OBSERVATION.

The right use of our senses—as in the appreciation of the distance, or height, or circumference of a body—is acquired by experience and reflection, and so also is the right conception of a natural phenomenon; and the reflection of it in all its purity, undimmed by the representations awakened during our perception of it, is the attribute of a well-trained mind. The botanist recognises at a glance the existence, and the varieties of the plants around him; the painter sees a multitude of points which the unskilled eye cannot detect even after the most fixed attention. None of the experimental sciences demand this acuteness and exercise of the imaginative faculty more strongly than physiology and pathology; and in few is it more rarely met with than in medicine. Hence arise the many contradictions in the comprehension of the simplest conditions, and the close succession of the most opposite modes of cure, and the constant appearance and speedily forgotten exist-

ence of numerous works on the unhealthiness of certain localities, on the nature of yellow fever, cholera, and the plague—works that have often been written by men, who never saw the place they describe, or a single case of any of the diseases they profess to treat of. In order to give validity to a theoretic view of chemistry and physics, it is indispensable that its truth be guaranteed by a series of practical investigations on the part of the writer. If this be wanting, the theory, although it may be the perfectly correct expression of a truth, will meet with little or no attention. It required the keen imaginative faculty of a Berzelius to save from utter disregard such a theory as that advanced by Richter* on chemical proportions, and to recognize the innate truth and existence of a common law of combinations amid a mass of false facts; among which, that single one, which forms the starting point for the table of equivalents—the non-existing carbonate of alumina—was sufficient to destroy all faith in the others.

* Richter's work entitled, "*Anfangsgründe der Stochyometrie, oder Messkunst chymischer Elemente.* (Elements of Stochyometry, or the Mathematics of the Chemical Elements), was published in 1792. Its object was a rigid analysis of the different salts, founded on the fact that when two salts decompose each other, the salts newly formed are neutral as well as those which have been decomposed. He endeavoured to determine the capacity of saturation of each acid and base, and to attach numbers to each, indicating the weights which mutually saturate each other.

ERROR ORIGINATES IN FALSE OBSERVATIONS AND COMBINATIONS.

Viewed with reference to natural inquiry, every erroneous mode of investigation depends upon the want of just observations, and the false conceptions we deduce from them; and is further based upon the error of considering the simultaneous occurrence, and concurrence of two phenomena as the proof of the existence of a connection between them. In nature numerous phenomena occur, of which *one* may be inappreciable, if another given one fail, while again innumerable other phenomena may occur together, or simultaneously, without standing in any mutual relation to each other. The assumption of an erroneous connection of this kind, originates in all cases in a false mode of investigation; and thus the combination of two phenomena, only similar in some one particular relation, is always the result of incorrect observation.

OBSERVATION.

To see and perceive by the senses is a condition of observation, but sight and perception do not characterise observation.

Observation is not limited to seeing the thing itself, but likewise the parts of which it is composed; thus a good observer must perceive and seek to become conscious of the mutual connection existing between the several parts among

themselves, and considered with reference to the whole.

EXAMPLES OF ERRONEOUS OBSERVATIONS—THE SUPPOSED INFLUENCE OF THE MOON UPON THE FORMATION OF DEW.

One of the most familiar illustrations of erroneous observation, is the influence ascribed to the moon in reference to the cold felt in moonlight nights, and to the formation of dew and hoar-frost, while the moon in these cases is a mere spectator of their formation.

In a work, in other respects very good, published at Dresden last year, on the influence of the moon upon the earth, the following passage occurs:

THE INFLUENCE OF THE ATMOSPHERE UPON EVAPORATION.

"In the absence of an atmosphere we cannot conceive the existence of water, or any similar fluid in a liquid form. If our globe were suddenly deprived of air, its rivers and seas must evaporate, and the whole earth would in a short time dry up as we see exemplified on a small scale by experiments under the air pump." Here, as we see, a connection between the atmosphere and evaporation is presupposed, which does not exist in nature. Without an atmosphere it is true no clouds would be formed, liquid water would not be converted

into vesicles of vapour, and aqueous vapour would not rise to so great a height; but the atmosphere has no effect upon evaporation, and an equal quantity of aqueous vapour is produced under the receiver of the air-pump, whether or not the air be exhausted.

DILUTION OF THE OXYGEN OF THE ATMOSPHERE BY NITROGEN.

We find in many physiological works the view advanced, that the nitrogen of the atmosphere contributes to the dilution of the oxygen, and the modification of its action upon the organism; whilst in fact the quantity of oxygen in a given space would not in any respect be changed, were we to assume that the nitrogen had suddenly been removed from the earth. Two gases varying in their nature exercise a certain pressure upon the human body and the surface, with which it is brought in contact; but the particles of the *one* gas do not compress those of the *other*. If we take two bottles, one filled with nitrogen, and the other exhausted, and bring them in contact by a glass tube, the nitrogen will distribute itself through both vials; if again both bottles are of equal volume, both will contain an equal amount of the gas, and the same thing happens when one vial instead of being exhausted is filled with oxygen at an equal pressure; the nitrogen will distribute

itself in the bottle as if no oxygen were present—the action of oxygen similar to that of nitrogen.

THE POWER OF THE SUN IN ATTRACTING WATER.

The fact of the impracticability of working some mines in the height of summer, owing to the veins or shafts being filled with water, has led naturalists to ascribe to the beams of the sun a power of attracting water, which, according to them is to be naturally explained by the action of the sun in drying up the soil, whence hollow spaces are formed which are again filled from below by capillary action. We know that a connection between the sun and the water takes place within the mine, but this simply depends upon the drying up of the brooks in summer; as the pumps which are destined to draw away daily an equal quantity of water, are impeded in their action by the stoppage of supply from these sources.

An analogous explanation may be given of the connection between the immoderate use of spirituous liquors and self-combustion, since it is most probable that none but drunkards would be likely to fall into the fire, and be thus consumed.

THE IDEA OF BOERHAVE ON THE ORIGIN OF ALKALIS IN PLANTS.

The false ideas concerning vital and material forces, which at this moment separate by an unfathom-

able abyss, the department of physiology from that of chemistry, arise entirely from the absence of *true*, and the presence of *erroneous* views: thus the ideas entertained in the eighteenth century of the occurrence of alkalies in plants, may be placed side by side with those entertained in pathology at the present day concerning the growth of a crystal, and the nutrition of an organic being. According to Boerhave the alkali belonged neither to the sap nor to the individual parts of the plant, but was a product of the process of combustion; and he represented to his hearers that decayed wood yielded no alkali which was as little a constituent of the plant as the glass, which many plants give on incineration.

FALSE COMPARISON BETWEEN THE COHESIVE FORCE OF CRYSTALLIZATION AND THE ORGANIC FORCE.

"Crystals like cells," so says Henle in his (Rationelle Pathologie),* "are restricted even under the most favourable conditions to a final limit of growth, although the former are less narrowly circumscribed than the latter. Crystals associate themselves together like cells in aggregate bodies, reminding us by their arborescent arrangement of the elementary parts in the higher plants. Material and vital bodies offer a certain measurable degree of resistance to external influences, but accommodate themselves to circumstances, even changing their forms occasionally. The most remarkable point of similarity between crystals and organized beings, is shown after injury from external influences. Crystals like organic bodies have the power of regenerating lost parts more or less fully. In both, the force which formed the body continues at work, independently of the matter which it has survived, or replaced. Thus if a crystal from which the angles have been cut off be laid in a fluid whence it may draw a substance analogous in composition to itself, it will increase generally, but more especially in the direction of the part where it was injured, so that the regular figure is first restored, just as an injured animal will, before all else, regenerate any lost part as far as typical laws permit regeneration in his individual case."

* Part. I. p. 101.

However true it may be that augmentation in the mass of an organic body be occasioned by the force of attraction, there is no resemblance externally between the growth of a crystal and the formation of an organism. The form of the membrane is not affected by the physical form of the atom, as it is in crystals, for instance, in a crystal of alum, consisting of an aggregate of particles of alum, where each individual crystal has a form precisely similar to that of the aggregate body. The cell is a whole within itself, and not an aggregate of smaller cells.

EXPLANATION.

Crystals have not, like cells, a limit of growth: the increase of size in the crystal is not occasioned by a cause acting from within in an outward direction, as in living organisms, but by the force of attraction upon the surface. This force is active at every point of the outer surface, while the molecules below take no part in the growth, and may even be removed without depriving the superficies of their capacity to increase. The new planes which are formed on truncating the angles of a crystal, exercise no stronger attraction on the molecules of the surrounding medium, than do the other planes; and they do not in any special manner perfect themselves.

By cutting off an angle from an octohedron we obtain a cubic superficies of the crystal, bounded by four converging octohedric planes; in a crystallizing fluid the body increases in three dimensions; the four superficies become longer and broader, and, in consequence of their elongation and convergency, the angle is restored, even when the cubic superficies has been incrusted. But when one angle is struck off a cubic crystal of alum, and the crystal be thus truncated, it does not increase, in the mother liquid, in a greater degree towards the truncated angle than towards any of the other sides; the original cube-like figure is not

restored, because the force of attraction of one individual portion of a cubic plane is not greater than the attractive force of an equally large portion of any one of the other six superficies of the outer surface.

A crystal which grows in a saturated solution, always increases on one side *especially*, that is, on the surface directed towards the bottom of the vessel, owing to this plane being always in contact with those particles of the saline solution, which have the greatest specific weight, and are most copiously charged with the crystallizing matter. There are also cases in which, in consequence of the difference of temperature of the upper surface and the bottom of the vessel, the crystal increases most in a downward direction, while the upper parts lose their form.

COMPARISON OF THE PARASITE THEORY WITH THE CHEMICAL THEORY OF CONTAGION, MIASMA, AND PUTREFACTION.

The source of the most frequent errors in judging of a condition of disease, originates in regarding things that frequently occur simultaneously, as necessarily exercising a mutual influence on each other; looking upon the one as the cause of the other. For the comprehension of diseased conditions and the choice of means to remove them, there is no view

which is more deficient in a scientific basis than that of identifying miasma and contagion with living organisms, as parasites, fungi, and infusoria; and regarding them as being developed and increased in the healthy body, where they thus induce a condition which may terminate in death.

A glance at the principles of the parasite and chemical theories, will suffice to show the respective merits of each.

But if, in the following remarks, I attempt to lay before my readers, by means of a series of facts, certain processes of the living organism, together with their relation to certain phenomena, observed in inanimate nature, I do it much less with the desire of advancing any new views regarding the nature and substance of contagion and miasma, or bringing forward the question of fermentation and putrefaction, than of drawing the attention of naturalists to a cause which, although hitherto ill-observed, is one that prevails generally, wherever a change occurs in the form and property of matter, or wherever combination and decomposition are going on. And if proof be adduced, that this cause exercises a decided and referable influence upon the indication and direction of the forces of cohesion and affinity, its undeniable share in the actions of vital force will be the less questioned, since vital force belongs to the same category as chemical forces, as far as the former manifests its activity

only by direct contact, or at immeasurably small distances.

INFLUENCE OF MECHANICAL MOTION ON CRYSTALLIZATION.

Every one knows that water freezes at all temperatures below 32° F., and that during the act of freezing the temperature remains at 32° F.; nevertheless, water may be cooled as low as 5° F., without becoming solid, if the fluid be in a state of perfect rest. The least disturbance is sufficient to effect congelation.

INFLUENCE OF MECHANICAL MOTION ON CRYSTALLIZING SOLUTIONS OF SALTS.

The same conditions affect a number of solutions of salts, dissolved by heat; if cooled in a state of perfect rest they do not precipitate any salts, and no separation occurs between the water and the dissolved salt, while the least disturbance—a particle of dust or a grain of salt thrown into the water—will induce the molecules thus disturbed to crystallize, and when once crystallization has begun, it is continued throughout the whole mass.

INFLUENCE OF MECHANICAL MOTION ON SULPHURET OF MERCURY, IODIDE OF MERCURY, AND IRON.

By constant shaking and friction, the black amorphous sulphuret of mercury is converted into

crystalline cinnabar, while the rough iron, whose parts are irregularly deposited, becomes crystalline on being hammered. On rubbing a portion of lemon coloured iodide of mercury, it passes into a new state of crystallization, and becomes scarlet.

From these facts it is shown that a mechanical motion exercises an influence upon the indication of the force which governs the condition of the body, and this motion is continued to its smallest molecules; for the formation of crystals it is necessary that they should be turned towards the direction in which the force of attraction is the strongest; it is, therefore, clear that atoms can be put in motion in fluids, as well as in solid bodies, by a stroke or blow, by friction, or by some other mechanical cause. The causes do not, however, exercise a certain influence on the indication of the cohesive power alone, but also upon the chemical affinity.

INFLUENCE OF MECHANICAL MOTION ON THE INDICATION OF CHEMICAL AFFINITY.

In a weak solution of chloride of potassium, tartaric acid does not deposit any precipitate: but mere shaking, or the friction of the inner wall of the vessel with a glass rod instantly causes a deposit of crystals of bitartrate of potash. The fulminates of silver and mercury explode with the greatest violence

on the application of a blow, or of friction; the same is the case with Berthollet's fulminate of silver, with picrate of lead, and many other compounds. It is clear that in these cases the blow or friction, or more correctly, the motion, is imparted to the atoms of these combinations; that the direction of their attraction is thereby changed, and that, consequently, new products are formed. Fulminate of silver contains cyanic acid. By the blow or friction, a new mode of arrangement is brought about; a part of the carbon develops itself, and combines with the oxygen, forming carbonic acid; nitrogen develops itself with the carbonic acid, and explosion is the result of the sudden transition to the gaseous form. The colourless fluid styrole becomes solid and hard through the influence of a purely mechanical motion. *(Sullivan.)*

HEAT SIMILAR TO THE ACTION OF A MECHANICAL FORCE.

A number of bodies are decomposed by heat, and in these cases its action is perfectly similar to that of a mechanical force. Heat acts like a wedge driven in between the atoms. If between two atoms the resistance, which the chemical force that held them together, has opposed to the en-

trance of the wedge be less than the force which separated them, the atoms fall asunder, and decomposition is the result. Oxide of mercury is resolved into oxygen and the metal. Heat acts in the same manner on bodies composed of more than two elements. At a certain temperature the fulminates of silver and mercury, Berthollet's fulminate, and picrate of lead explode. Heat alters the original mode of arrangement of the atoms, and, consequently, the equilibrium of their mutual attraction; under its action they are then deposited in the directions to which their attraction is the strongest. The formation of new products rests upon the establishment of a new state of equilibrium, and they suffer no further change as long as they continue exposed to the same degree of heat; but if the temperature be raised, a new disturbance occurs, and, consequently, a new state of equilibrium, and a new mode of arrangement of the elements. On being exposed to a faint red heat, acetic acid is decomposed into carbonic acid and acetone; the carbonic acid contains two-thirds of the oxygen, while the acetone contains all the hydrogen of the acetic acid; at a higher temperature the acetone is decomposed into a compound of carbon which contains oxygen, and into an oleaginous hydro-carburet. Exposed to a temperature of 392° F., the styrole becomes solid and hard, loses

its fluid character, and passes into a form resembling the most beautiful crystal glass.

INFLUENCE OF THE CONDITION OF CHEMICAL ACTIVITY.

It has been observed that platinum does not decompose nitric acid, and that it is neither oxidized or dissolved by this acid. A compound of platinum and silver dissolves, however, easily in nitric acid.

INFLUENCE OF THE CONDITION OF CHEMICAL ACTIVITY UPON THE CAPACITY OF BODIES TO ENTER INTO COMBINATIONS.

Metallic copper does not decompose water, when boiled with sulphuric acid; certain compounds of zinc, copper, and nickel dissolve, however, easily in sulphuric acid, with a development of hydrogen. In certain relations, compounds of these three metals will not dissolve in sulphuric acid, but if a trace of nitric acid be present, oxidation begins, which is then continued without further co-operation of the nitric acid. The solution of the platinum and copper follows in both cases against the electrical laws; heat or other causes, which might increase the affinity, have no share in the process.

INFLUENCE OF THE SAME CONDITION UPON THE CAPACITY OF BODIES TO SUFFER DECOMPOSITION.

If, further, binoxide of hydrogen be brought

in contact with hyper-oxide of lead or hyper-oxide of silver, the decomposition of the former is accelerated, as by many solid bodies, and it is resolved, with effervescence, into oxygen and water; but the molecules of both metallic oxides undergo a like decomposition when in contact with the decomposing parts of the binoxide of hydrogen; oxide of silver is resolved into oxygen and the metal, hyper-oxide of lead into oxygen and oxide of lead. Both oxides behave as if they had been exposed to a faint red heat.

It follows, from these appearances, that the condition of the combination or decomposition of a body, or of its change of place or motion, may exercise an influence upon the molecules of many other combinations brought in contact with it; they pass into the same condition; their elements are in a like manner separated, and they thus gain the power, which they did not possess in themselves, of entering into a combination.

The decomposition of the second body naturally proves that the resistance of the force, which strives to hold the atoms together in their original mode of arrangement, must be less than the force of that activity which affects it.

INFLUENCE OF A SIMILAR CONDITION UPON ORGANIC SUBSTANCES.

The property possessed by any substance in

combination or decomposition, to call forth in other bodies of similar or dissimilar nature in contact with it, a condition of form and character like its own, belongs, in a much higher degree, to organic bodies than to inorganic substances.

DECAYED WOOD.

Decayed wood brought in contact with that which is sound, changes gradually the sound body, under similar conditions, to a state of decomposition.

RELATION OF UREA AND HIPPURIC ACID IN URINE.

In fresh urine, if there is a complete exclusion of oxygen, no change of the urea, or of the hippuric acid contained in it occur; on exposure to the air, another substance, occurring in urine in consequence of the oxygen being taken up, suffers a change in form and properties, which is communicated to the urea and the hippuric acid. Urea is decomposed into carbonic acid and ammonia, and in the place of the hippuric acid which disappears, benzoic acid is found.

INFLUENCE OF THE PUTREFACTION OF WOOD ON THE OXIDATION OF HYDROGEN.

Decayed wood takes up oxygen from the air, and gives out an equal volume of carbonic acid.

If hydrogen be added to the air, it becomes oxidized with the wood, and acquires the property of combining, at the ordinary temperature, with the oxygen.

Under similar circumstances the vapour of alcohol absorbs oxygen, and becomes changed into acetic acid.

THE FIBRIN OF THE BLOOD AND YEAST ACT SIMILARLY TOWARDS BINOXIDE OF HYDROGEN.

Fresh fibrin stands in the same relation to air as damp wood, passing equally into a state of decomposition; if, in this condition, it be decomposed by binoxide of hydrogen, the latter is immediately resolved into oxygen and hydrogen; but if the fibrin be heated to boiling, this accelerating action ceases entirely. Yeast behaves in a like manner, occasioning an immediate decomposition of the constituents of the binoxide of hydrogen; but if it be previously heated to boiling, the action ceases.—(*Schlossberger.*)

RELATION OF COMBINED ORGANIC ATOMS AMONGST THEMSELVES.

These properties are in the highest degree appreciable in complex organic atoms. The larger the number of individual elements and atoms, which have associated themselves into a group of atoms of definite properties, and the

more various the directions of their attractions, the smaller in the same relation must the force be which attracts together every two or three of the minutest molecules of the group: they offer a slight resistance to the causes—whether heat or chemical affinities—which effect a change in their form and properties; and are as easily changed and decomposed as other substances of simple combination.

PUTREFACTION.

The constituents of plants and animals into which sulphur and oxygen enter are formed of compound organic atoms; from the moment they are separated from the body, and come in contact with the air, they pass into a state of decomposition, which, once begun, continues even after the air is excluded. The colourless sections of a potato, turnip, or apple, soon become discoloured and brown on exposure to the air.

In all these substances, the presence of a certain quantity of water, by which the minutest parts receive mobility, is a necessary requirement, in order that on a transient contact with the air a change of form and properties, and a breaking up into new products may be called forth; both of which continue until not a particle of the original body remains. This process has been familiarly designated by the term putrefaction.

AFFINITY NOT THE CAUSE OF PUTREFACTION.

Experience teaches us further, that a number of substances brought in contact with these putrefying sulphurous and oxygenous matters, when in the act of putrefaction, in like manner change their properties; in the act of decomposing, their elements group themselves into new products, in the composition of which there are, in most cases, none of the elements of the putrefying substances taken up. From all these phenomena it is clear that the decomposition of the second body is not effected in consequence of an indication of affinity, since the idea of affinity is inseparable from the idea of combination.

DECOMPOSITION OF AMYGDALIN AND ASPARAGIN BY PUTREFYING SUBSTANCES.

In contact with the nitrogenous constituent of germinating barley (diastase) asparagin is resolved into succinic acid and ammonia; amygdalin resolves itself with the nitrogenous constituent of sweet almonds (emulsine) into prussic acid, oil of bitter almonds and sugar; salicin into saligenin and sugar.

THE CONVERSION OF STARCH INTO SUGAR.

Potatoes and the flour of the cereal grasses contain no sugar. The mere contact with water is sufficient, in consequence of the change that

is thence effected in the sulphurous and nitrogenous constituents, to bring about a conversion of the starch into sugar.

THE SAME EFFECT PRODUCED BY ANIMAL MEMBRANE.

Animal membrane, when moistened with water, causes sugar of milk and grape-sugar to pass into lactic acid; a similar property is possessed by the gluten of the cereal grasses, by animal casein, and by diastase.

FERMENTATION AND ITS PROPERTIES.

The property of an organic body to pass into the same state of putrefying decomposition as the body with which it is brought in contact, is termed the process of fermentation.

DIFFERENT DEGREES OF PUTREFACTION, AND THEIR INFLUENCE UPON FERMENTATION.

If it be true that the change of form and property in the fermenting body be dependant upon those which are effected in the putrefying body, or in the agent of fermentation; if the new order of deposition of the atoms of the one body, be influenced by the direction in which the parts of the other arrange themselves; if finally the fermenting body behave, as if it were a part or constituent of the agent of fermentation, it is clear that the mode of separation in the one must

change with that of the other body; the fermenting body must yield other products if the disunion, or the chemical condition of motion change the agent of fermentation. Innumerable experiments testify to the correctness of these conclusions.

MILK OF ALMONDS AND SUGAR.

When the milk of almonds, which in its fresh state exercises no influence upon sugar, is left for a short period of time, it ceases to act upon amygdalin; and if in this condition sugar be added, the latter begins to ferment, and separates into alcohol and carbonic acid. If the almond milk be left still longer, it converts the sugar into lactic acid. A similar property is possessed by diastase, which, when fresh, converts starch into sugar; but after a period of eight days, it loses this action, and gives rise to fermentation.

CASEIN AND SUGAR.

In the first period of its putrefaction the casein of milk converts the sugar of milk and grape-sugar into lactic acid; at a higher temperature the sugar of grapes passes into alcohol and carbonic acid; and if the formation of free acids be hindered by the addition of an alcaline base, the casein in the last stage of its metamorphosis, occasions a decomposition of the saccharine atoms into carbonic acid, butyric acid and hydrogen.

ANIMAL MEMBRANE AND SUGAR.

Animal membrane behaves in the same manner. At first it effects a change of the starch into sugar, then of the sugar into lactic acid, and subsequently of the sugar into carbonic acid and alcohol.

THE INFLUENCE OF A HIGHER TEMPERATURE UPON FERMENTATION.

The same sugar of beet-root, which ferments at an ordinary temperature, and is decomposed into alcohol and carbonic acid, yields, on raising the temperature of the juice without the addition of any foreign substance, mannite, lactic acid, gum, carbonic acid and hydrogen.

FOUSEL OIL FROM SUGAR.

The same sugar yields, on changing again the conditions of its fermentation, butyric acid; it is decomposed, in the fermenting molasses of beet-root sugar into water, carbonic acid and hydrated oxide of amyle (fousel oil.)

SEPARATION OF THE SUGAR, SIMILAR TO THAT OF ACETIC ACID OCCASIONED BY THE ACTION OF HEAT.

Milk sugar and sugar of grapes contain the same elements as lactic acid, and combined in the same relative proportions.

The products which appear on the fermentation

of sugar of grapes contain precisely the same elements as an atom of sugar. Its decomposition is a simple separation, or transposition of its atoms, as is seen in acetic acid on the application of a higher degree of temperature. The carbonic acid contains two-thirds of the oxygen: the alcohol all the hydrogen of the atom of sugar.

THE PROPERTY OF CAUSING FERMENTATION IS COMMON TO ALL COMPOUND ORGANIC ATOMS.

If we take into consideration that the capacity of producing putrefaction or fermentation is common to bodies of the most various forms of composition; that blood, meat, cheese, membranes, cells, saliva, diastase, milk of almonds, &c., gain this property as soon as, by the chemical action of oxygen, a disturbance of the state of equilibrium has been excited in the attraction of their elements, it would seem that all doubt of the true cause, by which these phenomena are brought about, must vanish.

CAUSES OF THE CHANGE OF FORM AND PROPERTY OF MATTER.

A change of place or position in the most minute particles of a number of compound substances, and their decomposition, or conversion into new products may be called forth by chemical action, by heat, or electricity; and it may also

be occasioned by a transference of some condition of motion, or by contact with a body, the particles of which are undergoing a change of place.

CONTINUANCE OF THE DECOMPOSITION.

If, from any external cause—by contact with oxygen, &c.—the condition of equilibrium in the attractive force of the elements of one of these compound atoms be disturbed, the result is the establishment of a new condition of equilibrium. The motion imparted to the first molecule is transferred to the second, the third, &c., of the parts of similar nature, extending even to all dissimilar particles, and to all other substances, if the force which held together their elements in their original form and character be less than that acting upon them with an opposite tendency. Want of power to maintain an original condition is want of power of resistance. Every body which is capable of offering this degree of resistance, hinders putrefaction and fermentation in most cases by entering into a chemical combination with the body susceptible of either of these conditions; and the power of maintaining the original mode of arrangement is strengthened by every new accession of the force of attraction. To the force which maintains the condition of the first body, is added a second attraction which

must be overcome before the elements of the first can change their locality or size.

ANTISEPTIC SUBSTANCES.

Amongst the substances which counteract putrefaction and fermentation we must mention before others, sulphurous and arsenious acids; further, many mineral acids, metallic salts, empyreumatic substances, volatile oils, alcohol, and common salt.

These substances exercise a very unequal influence upon putrid matter. Alcohol and common salt in certain quantities arrest putrefaction, and consequently the process of fermentation, by removing from the putrid body a certain quantity of water, which is a necessary requirement for this change. Sulphurous acid, which is capable of entering into combination with all organic matters generally, and therefore with all bodies susceptible of putrefaction, hinders this process on the same principles.

RELATION OF ARSENIOUS ACID TO MEMBRANES.

Arsenious acid does not exert the smallest influence upon the fermentation of sugar in the juices of plants, or upon the action of yeast on sugar :—(*Schlossberger.*) Neither does it affect the putrefaction of the blood, but its action on

membranes and the membranous structures is unquestionable. Whilst a bladder, or a bit of membrane covered with water is thoroughly decomposed and liquefied, giving off, in the course of six weeks or less, a most offensive stench, another piece of membrane or bladder likewise in contact with water will remain unchanged and without smell, if arsenious acid have been added to the fluid; the explanation of this difference is, that the gelatinous tissue enters into combination with the arsenious acid in the same manner as skin combines with tannic acid.

By means of a knowledge of the causes of the origin and extension of putrefaction in organic atoms, we are able to give a simple reply to the question of the nature of many forms of contagion and miasma, as the following remarks will show.

EXTENSION OF THE PROCESSES OF PUTREFACTION AND FERMENTATION IN THE LIVING ANIMAL BODY.

It still remains a question with many, whether there are facts to prove that the condition of decomposition or putrefaction of a substance be propagated to parts or constituents of the living body, and whether by contact with the putrefying substance, a condition will be induced in the parts of the human body, similar to that at work in the molecules of the putrid matter. We think

there can be no hesitation in answering this inquiry in the affirmative.

FACTS.

It is a fact that the dead body often passes into such a state of decomposition while in the anatomical theatre that the blood of the living body is affected by it; the slightest puncture with a knife that has been used in dissection induces a dangerous or even fatal termination. The facts observed by Magendie that vomiting, lassitude, and even, after a prolonged period, death have been induced, by applying blood that is in a state of putrefaction, cerebral substance, bile, and putrefying pus to fresh wounds, have never yet been contradicted.

It is a fact that the use of many articles of food, as ham, sausages, &c., in certain stages of their decomposition, induce the most dangerous conditions of disease in the healthy body, and not unfrequently are the cause of death.

WHAT IS TO BE UNDERSTOOD BY THE TERM "PRODUCTS OF DISEASE."

These facts prove that an animal substance in the act of decomposition may induce a process of disease in the bodies of healthy individuals, and that this condition can be transferred to their organs and constituent parts. But as the products of disease can

be only understood to mean parts and conditions of the living body in a condition of change in their form and properties, it is clear that as long as this condition remains imperfect, disease may be transferred to a second, or third individual, &c.

ANTISEPTIC SUBSTANCES RETARD THE EXTENSION OF CONTAGION AND MIASMA.

If now we take into consideration further, that all those substances or causes which destroy the propagating tendency of contagion and miasma, are at the same time requirements for the removal of all processes of putrefaction and fermentation—if daily experience show that, empyreumatic substances, as pyroligneous acid for instance, which most strongly counteract decomposition, are the means of changing entirely the process of disease in wounds suppurating unhealthily, and if further free or combined ammonia (the almost invariable product of putrefactive processes) be found during many contagious diseases, as for instance, typhus in the surrounding atmosphere, and in the urine and fæces; it surely then seems impossible to entertain a doubt concerning the cause of the origin and further propagation of a number of contagious diseases.

PUTREFACTIVE PROCESSES AS CAUSES OF CONTAGIOUS DISEASES.

General experience has at length shown us that

"the origin of epidemic diseases can often be traced to the putrefaction of a number of animal and vegetable substances; that miasmatic diseases become epidemic where there is constant decomposition of organic matter in marshy, damp districts. And that they also develop themselves epidemically under similar circumstances after inundations; besides, in other places where a large number of people are assembled together with little change of air—as in ships, prisons, and besieged places, &c.;* further on at page 57, the same author observes that "we can never prognosticate the origin of epidemic disease with more certainty, than when a marshy flat has been dried up by continued heat, or when excessive heat follows extensive inundation."

CONCLUSIONS.

Here our deduction is fully justified according to the rule of natural inquiry, that in all cases where a process of putrefaction has preceded the first indications of disease, or where disease can be communicated by solid, fluid, or gaseous products, and where no more immediate cause can be adduced, the substances or matter in the act of decomposition must be looked upon as the most probable cause of disease.

* Henle, Untersuchungen, p. 52.

POWER OF INFECTION—IN WHAT IT CONSISTS.

The requirement for the capacity of infecting a second individual, is the presence in the body of the latter of a substance which can oppose no resistance either in itself, or through the vital energy in the organism to the causes affecting a change of form and property. If this substance were a necessary constituent of the body, disease must be transferable to all individuals; if only an accidental constituent, those persons alone would be infected in whom this substance was present in sufficient quantity, and of the characteristic nature. The termination of disease is only a destruction and removal of this matter; it is a re-establishment of the condition of equilibrium of those causes in the organism which regulate its normal functions, and which had been temporarily suspended.

A CHALLENGE TO INVESTIGATION.

Practical medicine will soon decide whether this view be correct or not; and it will then be shown whether there is any actual connection between the relation of arsenious acid to animal membranes out of the body, and their action in certain fevers; and between the relation of mercurial compounds to animal substances, and their action in contagious diseases.

If this so-called chemical view do not serve as a guide and director to the physician, after a careful study of the processes of putrefaction of simple and compound bodies, and of the materials or causes by which these processes are altered, hindered, or accelerated; and if a comparison of this with other analogous processes in the human organism, be not the means of enlarging his views upon disease, and raising to a more scientific basis his knowledge of the remedial agents to be employed; then, indeed, it were of no avail to endeavour to support this theory. Its simplicity has stood much in the way of its being generally received; for at the very time that every physician or physiologist does not hesitate to ascribe the most striking changes in vital processes to bad nutriment, want of fresh air, or the continuous use of salted food, &c.—whilst no one feels any scruple in assigning a scarcely appreciable difference of temperature as the cause of inflammation, fever, and death—one of the most important causes of a change of form and properties is disregarded, as exercising no influence upon the organic vital process.

Here is a theory strengthened by a firmly linked chain of numerous and most evident facts, to which a critical investigation is denied, although there is nothing that can be advanced against it save its comprehensibility. But it is precisely on this latter character that the difference rests, which is

observed in the result of various methods of physical investigation. Although every pathologist and physiologist is fully convinced that no organic process can be explained without the co-operation of chemical and physical forces, every theory which has hitherto been based upon such causes has been invariably doubted and rejected.

If we compare the so-called chemical theory with the principles of the parasite theory, we cannot comprehend how intellectual men, and the most practised observers, can defend and lend their sanction to views which the experience of each succeeding day must refute.

THE PARASITE THEORY.

The principles of the parasite-theory may be referred to two facts, viz., to the propagation of the itch, and to a disease appearing in silk-worms, called *muscardine*.

THE ITCH.

The itch is an inflammation of the skin, occasioned by the irritation of a kind of mite (acarus scabiei, sarcoptes humanus*), which lives upon the skin, or, more correctly speaking, burrows within it. For the communication of the itch continuous

* An excellent account of this insect, and of the other parasites infesting the human body is given in Vogel's Pathological Anatomy. See Dr. Day's translation, p. 419.

vicinity is necessary, and that especially at night, as the itch-mite is a nocturnal depredator. The fact of the itch-mite being the vehicle of the contagious character of the itch, is proved by the following facts: inoculation with the pus of itch-pustules does not engender the itch, any more than the application of the crusts of scabious pustules upon the arm. Secondly, the disease is healed by rubbing off the mites with brick-dust; and it can only be propagated by the impregnated female animalcule. The itch may continue until it induces general permanent disease, which in these cases becomes established, and cannot be spontaneously cured.

THE ITCH A CONTAGIOUS DISEASE PROPAGATED BY AN ANIMAL.

Contagion of the itch is, according to this theory, an animal with a mandibular apparatus, which lays eggs; we term it fixed contagion, because it cannot fly, and its eggs cannot be transported by atmospheric influence.

If it be proved that the itch may be propagated by animals, it requires neither a chemical nor any other theory to explain the communication of the disease; and it becomes evident that all conditions which are similar to the itch belong to this class, where observation shows approximating or like causes, for the communication and extension of the disease.

CONTAGIOUS DISEASES NOT COMMUNICATED BY ANIMALCULES.

If now it be asked, what results have been obtained from investigation into these and other similar causes of infectious diseases, we may answer, that in the contagion of small-pox, the plague, syphilis, scarlatina, measles, typhus, yellow fever, dysentery, hydrophobia, &c. the most attentive observations have not been able to trace any animalcules or organic entities to which the means of propagating the disease could be ascribed.

PARASITES IN BODIES OF THE HIGHER CLASSES OF ANIMALS.

We have already observed, that there are a number of insects which can alone be developed and propagated in the body or under the skin of the higher animals, and that they may, in many cases, induce disease, and even death; and it will, therefore, be perfectly clear that the itch-mite belongs to this class of diseases, since the size of the animalcule can make no difference in the explanation.

There are, accordingly, diseases occasioned by animalcules, parasites, which develop themselves in the bodies of other animals, and thrive at the cost of some of their constituent parts; and they cannot

be mistaken for other diseases, where such causes do not prevail, whatever resemblances there may be in external indications. It is possible that further observations may attest the fact, that some or other of the contagious diseases belong to the class dependant upon parasites; until, however, such a fact be established, we must, according to the rules of natural investigation, avoid assuming it. It is the province of scientific enquiry to discover the especial causes by which they have been induced, the simple question concerning which will lead the way to an explanation of the subject.

That infection in contagious diseases is dependant upon an organic being, and that the itch must be regarded as a type of contagious diseases, were facts which it was endeavoured to ground upon the deduction of like effects springing from like causes.* A similar mode of reasoning has, for centuries, impeded the advance of the natural sciences, and even continues at the present day to lead to many errors.

The pure miasmatic diseases, and their so-called miasma, have not as yet been laid open to investigation in reference to their origin and the manner of their extension, and on that account no explanation has hitherto been attempted, either by a

* Henle, Zeitschrift, 2 Bd. p. 305.

chemical or parasite-theory. The parasite-theory has designated *muscardine* as the type of those miasmatic contagious diseases which arise from matter derived either from the air or from the diseased body.

MUSCARDINE.

Muscardine is a disease of the silk-worm, occasioned by a fungus. The germ of the fungus, when introduced into the body of the worm, grows in eating its way into the interior, and after the death of the animal it penetrates the skin, when the surface soon appears covered with a forest of fungi, which by degrees dry up, and are converted into dust; this is raised and scattered in the air by the slightest motion of the body on which the fungus grows. Good nutrition, and perfect health and strength increase the capacity for infection; and thus, in a colony of silk-worms, the finest and largest are always the most affected by the disease.

PARASITES IN ANIMALS AND PLANTS.

Similar parasites have been observed on diseased fish, in infusoria, and in hen's eggs; and it is clear that these observations confirm a series of facts regarding the animal organism which often occur in the vegetable world, proving that disease and death are frequently induced by para-

sites, which live exclusively upon the constituent parts of other bodies; as yet, however, no connection has been drawn between these facts and the origin and propagation of miasmatic contagious diseases; and if it be allowable to designate a fungus, or its spores, by the term contagion, it is clear—since the size of the fungus makes no difference in our mode of considering it—that some sources of contagion attain to a length of six or eight inches, this being the size of the fungus, *Sphæria Robertii*, which develops itself in the body of the New Zealand grub, and occasions its death.

FALSE VIEWS OF THE CAUSES OF PUTREFACTION ARE THE FOUNDATION OF THE PARASITE-THEORY.

A view of the cause of fermentation and putrefaction, which is thoroughly false in its principles, has hitherto served as the main support of the parasite-theory. Its adherents regard putrefaction as a decomposition of organic beings, by infusoria and fungi, and every putrefying body as a sort of rampart of infusoria, or a plantation of fungi; and thus, according to this view, wherever organic bodies pass into putrefaction to any extent, the whole atmosphere must be filled with the germs of the contagion, and become the cause of disease.

FUNGI AND INFUSORIA DO NOT OCCASION PUTREFACTION.

It has not escaped the advocates of the parasite-theory, that a close connection exists between putrefaction, contagion, and miasma; although they avoid entering upon an explanation of the mode of comprehending the connection of these phenomena, and their mutual dependence upon each other. This connection would be established, if it were proved that infusoria or fungi, induced putrefaction or fermentation; that by them and their process of digestion and respiration, sugar is resolved into equal volumes of carbonic acid gas, and vapour of alcohol; and that the following conversions are brought about, viz., urea into carbonate of ammonia; salicin into sugar and saligenin; sulphate of protoxide of iron into sulphuret of iron; sulphate of lime into sulphuret of calcium; sulphate of soda into sulphuret of sodium; blue indigo into white indigo; starch into sugar; sugar into lactic acid; amygdalin into prussic acid, bitter oil of almonds, and sugar.

The following remarks will show how thoroughly untenable are these views.

OPPOSITION BETWEEN PUTREFACTION AND THE PROCESS OF LIFE.

The constituents of vegetable and animal structures have arisen under the dominion of an active

cause of change in the form and properties of organisms; and this is vital force, which decides the direction of attraction, and opposes the force of cohesion, heat, and electricity, destroying the influence of every cause that hinders the association of atoms in combinations of a higher order without the organism. In compositions of such various nature as the organic atoms, these other forces occasion a change of form and condition, when the vital force after death no longer opposes their action. The same leaf, or the same grape which possessed the capacity of giving off pure oxygen to the atmosphere, submits to the chemical action of the oxygen from the moment of its separation from the organism, and its being brought in contact with the air.

No organism—no portion of an animal or plant is capable, after the extinction of vital energy, of resisting the chemical action which air and humidity exercise upon it, and its elements fall back under the unlimited dominion of chemical force. Fermentation and putrefaction are the stages of its retrograde development, presenting less perfect combinations, until at length the organic atoms, in consequence of continuously acting unorganic forces, return to their simple original forms, in which they may serve for the development and nutriment of new generations.

FUNGI AND INFUSORIA ARE SUBJECTED TO PUTREFACTION, FERMENTATION, AND DESTRUCTION.

Fungi and infusoria are organic beings with constituent parts of the same composite nature as those of the higher orders of vegetables and animals, and we observe the same phenomena in their bodies after death, as those which accompany the disappearance of all organisms, and find them in a state of putrefaction, fermentation, and corruption; how then is it possible to regard fungi and infusoria as the causes of these processes, when they themselves become putrid, fermented, and corrupt, leaving nothing but their inorganic skeletons?

FUNGI AND INFUSORIA ARE THE ATTENDANTS, BUT NOT THE ORIGINATORS OF THE PROCESS OF PUTREFACTION.

No one will deny that fungi and infusoria are found in a great number of putrefying and corrupting substances; but the frequency of their appearance cannot possibly be adduced as a motive for regarding them as the causes, instead of the attendants of these conditions. Fungi and infusoria are shown by nature, in reference to their nutriment and development, to be organic atoms, which have ceased to be parts or constituents of living organisms, and, in most cases, they do not appear until putrefaction be established, or is complete,

and the process of corruption has begun. It cannot be doubted that all processes and their respective products are changed by their presence, for by means of their process of nutriment and respiration, they accelerate solution, limiting its baneful influence upon the surrounding parts to the shortest possible period of time.

FUNGI AND INFUSORIA HASTEN THE PROCESS OF PUTREFACTION AND CORRUPTION.

If the process of putrefaction be terminated by the return of the elements of organic beings into carbonic acid, and carbonate of ammonia, it is clear that the period necessary to effect this conversion must be most perceptibly curtailed if the putrefying agent be a plantation of infusoria, millions of whom are busily engaged in leading the constituent parts of the body into a state of decomposition by means of their respiratory and digestive processes.

BY THIS MEANS THEY BECOME THE ENEMIES OF THE PROCESS OF PUTREFACTION.

It can no longer be doubted that nature has assigned to the infusoria the important part of being the enemies and opponents of all contagion and miasma; since the most incontrovertible facts have shown that the green and red infusoria are during their life, and the process of their propagation, sources of the purest oxygen.

In a similar manner fungi check putrefaction by converting to their own nutriment, the sulphurous and nitrogenous constituents of vegetables—the actual originators of corruption; and thus further, the general transition into the final products of corruption.

THE NATURE OF YEAST.

The views which the adherents of the parasite theory have formed as to the cause of putrefaction, mainly rest upon observations which have been made upon the formation of the yeast in the fermentation of wine and beer; but the investigations into the nature of the yeast are not yet closed, and it is to be presumed that the microscopic observations already made will be strengthened by further inquiry, and every doubt concerning its vegetable nature be thus set aside; yet even in this case the explanation regarding the separation of sugar into alcohol and carbonic acid, would admit of no other expression than that assumed by the chemical theory.

RELATION OF THE YEAST IN SOLUTIONS OF SUGAR, IN GRAPE JUICE, AND BEER WORT.

It is a perfectly well-known fact that in spirituous fermentation, the elements of the sugar of grapes without any loss of weight, and those of the sugar of cane with an increase of weight, are given back in the form of carbonic acid and

alcohol. We cannot here, according to our usual conceptions, speak of the conversion of the atoms of sugar to the nutritive and respiratory processes of an organic being. The weight of the yeast increases in the fermentation of the juice of the grape and beer-wort ; but if we put the yeast in a solution of pure sugar and water, although the fermentation is equally produced, the yeast in this case instead of gaining, loses a portion of its weight ; and by continuous contact of the same yeast with fresh sugar and water, it by degrees entirely loses the power of fermenting, while its weight constantly diminishes. In this case, as we see, one and the same action must be derived from two directly opposite causes, to one of which is ascribed the capacity for increase, and to the other the reverse of propagation. If we assume that the nutritive and respiratory processes of the fungi are dependant upon sulphurous and nitrogenous substances contained in their elements, and that the fermentation of sugar is an accidental phenomenon, accompanying the developing process of an organic being, then it is quite incomprehensible whence it arises that the fungi are not reproduced in a fluid, where there is present this chief requirement to their propagation, while they gain in weight as soon as sugar, the accidental attendant of this vital process, is added. If, for instance, in the juice of

the grape, sugar be decomposed, and there is no free access of air, the remainder of the dissolved sulphurous and nitrogenous substances will remain dissolved in the juice for years without undergoing any change ; if sugar be then added, the fermentation begins again, and yeast is again separated ; when the sugar is decomposed, its separation ceases, beginning again only on a new addition of sugar ; and this continues until the fluid contains an excess of sugar.

THE FORMATION OF YEAST, ALCOHOL, AND CARBONIC ACID ARE MUTUALLY DEPENDANT UPON EACH OTHER.

From these facts we evidently obtain a reciprocal relation of dependence, as required by chemical theory, between the form and properties of the sulphurous and nitrogenous body which is converted into yeast, and the new forms and properties contained in the atom of sugar ; and it is clear that the condition in which the elements of the former stand during their association with the yeast, and their falling asunder into other products, is the cause of the manner in which the sugar separates. No organic beings or animals similar to fungi, have ever been observed in any other form of separation of sugar, as, for instance, in its transition into lactic acid by means of an animal membrane, or in its transition into mannit, gum, butyric acid, acetic acid, &c. ; nor in any other

process of putrefaction or fermentation, have organic beings been perceived, which appearing invariably in the same forms, control the nature of the products.

VIBRIONES IN THE URINE.

In many cases the presence of vibriones is detected in the urine during its state of putrefaction, while in other cases, when the urine putrefies, it is impossible to discover any organized being, and if the absence of vegetable or animal organisms is certain in one single case, where fresh urine has been decomposed by the putrefying white deposit which occurs in a state of putrefaction, the fact is perfectly sufficient to remove every doubt of the true cause of the putrefaction.

FUNGI CONTAIN SUGAR.

If further we show that, in all hitherto examined fungi, analysis has yielded a quantity of sugar, which during the process of life did not pass into alcohol and carbonic acid, but that, in the same fungi, spirituous fermentation occurs immediately after their death, and from the moment when a change in their colour and properties is perceived, every analogy is wanting to justify our regarding the vital process of these plants as the cause of fermentation. The action must rather be ascribed to the reverse of a vital process.*

* Schlossberger, Annalen der Pharmacie, Vol. LII. p. 117.

CHANGE IN THE PROCESS OF PUTREFACTION IN HEATED AIR.

We may consider it as proved by the most admirable experiments, that the process of putrefaction in meat and many other animal substances assumes a totally different form, when these substances have been preserved in vessels containing heated air, and when consequently there can be no co-operation of infusoria; yet these animal substances by no means, under these circumstances, maintain their original condition; they change their colour and composition, and if the water necessary to the complete decomposition of the meat be present, it dissolves after a certain period into a most offensive mass.* We need only recal to mind the relations of fresh urine in order to perceive that in many of these animal substances a constantly renewed afflux of oxygen is a requirement for their putrefaction; that on the exclusion of oxygen, the urea does not pass into carbonate of ammonia, and that, enclosed in a vessel, these

* De Saussure in his beautiful investigations observed the fact that hydrogen at a glowing heat obtained by the decomposition of aqueous vapour by means of iron, and in contact with putrefying or decayed animal substances entered into no combination with oxygen; while at the ordinary temperature, pure hydrogen was easily condensed under these circumstances. This deserves attention in an inquiry into the influence of heated air upon the process of putrefaction. Possibly the decomposition of infusoria and the germs of fungi may not be the only cause of the change in this process.

substances convert the oxygen into carbonic acid, and that with the removal of the oxygen, the whole process is arrested, or at all events changed.

The adherents of the parasite theory assume, that by the passing contact of sugar of grapes with the air,(without which fermentation could not begin) the germs of the yeast plant which are present everywhere in the air, find access to a soil which affords them the necessary requirements for their fruitful development; but they do not explain the reason why the brewer is obliged to add yeast in order to turn his wort to a state of fermentation; and why these same germs, if they really were in the air, should not develope themselves in a soil so congenial to the requirements of their life and propagation. They entirely forget that the fermentation of the sugar of grapes begins with a chemical action, that a measureable quantity of oxygen is taken up from the air, that the juice becomes turbid and discoloured, and that fermentation only begins after the occurrence of a precipitate; they do not consider that fermentation diminishes instead of increasing with the additional quantity of oxygen; and that under certain conditions when the matter capable of taking up oxygen has become insoluble, fermentation no longer goes on in the juice.*

* Two cubic centimeters of must, three millimeters thick and thirty millim. in diameter, in contact with twenty cubic centim. of oxygen do not pass into a state of fermentation; while a similar stratum without the addition of oxygen occasions a considerable development of carbonic acid.—De Saussure in the Jahrbuch für Chemie, vol. LXIV. pp. 47—51.

Before all these relations have been thoroughly examined, it would be contrary to all sober inquiry to consider the vital process of an animal or plant as the cause of any process of fermentation or putrefaction; and in all cases where the presence of organic beings is not to be shown on investigation in the contagion of a miasmatic-contagious disease, the hypothesis of these bodies having or taking any share in the process of disease must be rejected as altogether unsound.

TWO SIMULTANEOUSLY OCCURRING PHENOMENA ARE FREQUENTLY HELD TO BE A CAUSE, AND ITS EFFECT.

Another no less grave error in the mode of considering and deciding upon a question, is to look upon two different phenomena, which are effects of one and the same cause, as mutually dependant upon each other, and regarding the description of the one phenomenon as an explanation or definition of the other.

EXAMPLES.

This is the case, for instance, with the explanation which is given of fever, of crises, &c. A few examples of similarly false combinations, which

daily occur in life, will best exhibit what is here alluded to.

A STORM REGARDED AS THE CAUSE OF UNUSUAL CHANGES IN THE STATE OF THE BAROMETER.

Nothing is more common than the opinion which ascribes to storms the effect of making the mercury fall in the barometer.

Storms are effects of a difference of temperature, or of some other causes of interrupted equilibrium of the pressure of the atmosphere. A change of the pressure of the atmosphere exhibits itself by its influence upon the rise and fall of a column of mercury, which is of equal weight with a column of air of the same diameter. The barometer and the storm do not stand in any immediate relation to each other; the storm exercises no influence upon the barometer, and the two are only combined by their mutual dependence upon one cause. And in precisely the same manner the fall of the barometer is connected with the occurrence of rain.

SYMPTOMS OF FEVER MUST NOT BE REGARDED AS THE CAUSES FROM WHENCE IT ARISES.

The false ideas which many pathologists have formed to themselves of the cause of fever belong to this class of errors regarding the *causa efficiens*, and to the confusion of ideas concerning effect and cause.

HENLE'S EXPLANATION OF FEVER.

"Although I am far from thinking," says Henle,* "that I am able to settle the controversy regarding the question of the existence of essential fevers, I yet believe I may contribute something that shall enable the contending parties first to understand themselves better, and next their opponents. It follows that as febrile symptoms are the consequences of an alteration in the central organ, so this alteration is the proximate cause of the febrile symptoms; and as the fever depends upon these symptoms, upon the complication of the change of temperature, motion of the blood, of thirst and lassitude, this alteration must be the proximate cause of the fever—in fact the fever itself."

Setting aside that these three positions are not consecutive links of one conclusion, since each one says the same as the other two—we cannot in accordance with the rules of natural investigation —so long as the causal connection of the febrile symptoms and the alteration in the spinal cord be not explained—regard the febrile symptoms as anything more than indications of the changed condition of the spinal cord. To the symptoms of fever which are externally perceptible, must be added the scientific investigation of a new indica-

* Untersuchungen, p. 240.

tion of disease. The alteration in the central organs is a fact perceived, or to be perceived by the senses, but not a cause.

WHAT COURSE MUST BE PURSUED IN THE INVESTIGATION OF THE CAUSE OF FEVER.

If it be assumed that this alteration is always and unalterably accompanied by febrile symptoms, the knowledge and explanation of the cause of fever must include the recognition of the connection of the three constantly recurring indications of fever—that is, the subjective feeling of indisposition, the alterations in circulation and respiration, and the changed phenomena of heat, which characterize the febrile condition, as well as the relation of their mutual dependence.

If we exclude from investigation, as inexplicable phenomena, the subjective indications, the feelings of indisposition, and of heat and cold, it still remains to trace the connection existing between the alteration of the spinal cord, the accelerated movements of the blood and the respiratory apparatus, and the altered phenomena of heat. Before we can obtain any explanation of this, we must arrive at a conception of motion, and seek the source of a moving force and heat in the animal body. If we would trace the cause of fever according to the physical method, and consider that by the co-operation of many, or let us say of two causes, a certain amount

of force is engendered in the heart itself, by which the circulation of the blood is affected; then the motion will be regular or normal, if the number of the beats of the heart be equal in every minute, and when the force is thus divided over equal periods.

POINT OF VIEW OF THE INVESTIGATION.

If this same amount of force, in consequence of the disturbed relation of the two causes, which have their seat in the heart, at one time increases and at another diminishes, the pulsations of the heart will be at one time quicker, and at another slower. The force engendered is in this case not proportionate to the term of its consumption. It is clear that, on the supposition of this force being engendered in the heart, the alteration in the spinal cord can exercise no other influence upon the change in the phenomena of motion, or upon the accelerating or retarding of the heart's action, than that, in consequence of its condition, it may oppose, in some manner or other a smaller resistance to motion at one period than at another. The causes of the effects of motion do not exist in the heart alone; they are distributed in every part of the organism, in the spinal cord, as well as in every individual muscular fibre.

ENQUIRY INTO THE CONNEXION OF THE SPINAL CORD WITH THE EFFECTS OF MOTION.

We may conjecture that the movement of the heart, as well as that of all other parts of the organism, the motion of the intestines, and the voluntary motions, proceed from the spinal cord, and it is evident that a change in the condition or character of this organ must be followed by a change in all the phenomena of motion. The same must happen when any part of the nerves, standing in connection with the spinal cord, and with the circulatory apparatus, &c., suffers a change of condition or properties, and this changed activity must exercise a retrograde influence upon the spinal cord and the apparatus of motion. The laws of the propagation or communication of motion, are everywhere the same, whatever causes may have called them forth.

The cause of motion in a mill, the rotatory motion of the stone, the bolting of the flour, &c., are not occasioned by the wheel, for that is a portion of the mill itself. It is quite certain that an irregularity in the working of the mill may be occasioned by the removal of a few of the wings of the wheel, by which the pressure of the water on these parts ceases; it may also, however, be occasioned by the breaking off of the cogs of one of the other wheels

of the mill, when an irregularity of motion will be perceived not only in this wheel, but in every other part of the wheel.

REGULAR AND IRREGULAR MOTIONS.

If now the organism engender a certain amount of force in a given time, the motions will be regular if the force proceed from the spinal cord; irregular if one apparatus have more force than another. If subsequently the motions of the blood and respiration be accelerated, the consequence will be weakness in the limbs, or a disturbance of the digestive functions. The extra force which the heart receives in the acceleration of its action, cannot be applied to the other apparatus of motion.

After establishing the connexion between the spinal cord and the effects of motion, the relations of the latter to the phenomena of animal heat must next be discussed.

RELATION OF THE PHENOMENA OF ANIMAL HEAT TO THOSE OF MOTION.

Observation shows that the irregularity of the phenomena of motion is accompanied by a change in the phenomena of heat; in many cases the subjective and objective phenomena of heat rise and fall with the acceleration or retardation of the indications of motion; in other cases again both do not recur simultaneously in the same relations.

But the phenomena of motion become more regular by the equalization of the indications of heat; and if the former are restored to a normal state, the latter will show a proportionate degree of irregularity. If, now, it can be shown that the effect of motion (speed) does not call forth heat (as, for instance, by friction,) it naturally follows that heat and the phenomena of motion stand in no nearer connection with each other than the storm with the abnormal rise and fall of the mercury in the barometer, and that, consequently, the causes which have influenced the one series of phenomena are simultaneous conditions of the other series. If the amount of evolved heat in a given time stand in a definite relation to the number of blood-corpuscles which have passed through the capillaries in the same time, the source of heat must be sought in certain states of the blood-corpuscles, or of the blood and the capillaries.

RELATION OF THE PHENOMENA OF HEAT TO THE OXYGEN OF THE AIR.

Since it is proved, by investigation, that the condition of the blood, by which it may become a source of heat, consists in its power of taking up oxygen, and since the oxygen thus taken up in a given time stands in a definite relation to the number of inspirations within the same period, irregular effects of heat must be dependant upon the

respiratory motions, the contractions of the heart, and *one external cause*—and this is, the chemical action of oxygen. As the relation of these three factors to each other is altered, the phenomena of heat must in like manner change; and when in certain parts of the organism the capacity of entering into combination with the oxygen increases from any superadded cause, more heat will be evolved in that one part than in others. When, in accordance with this, the motion of the circulation and respiration is accelerated, then will also the amount of oxygen and liberated heat be increased, which is in accordance with the beautiful law established by Vierordt. If the respiratory and circulatory motions are accelerated in unequal relations, the subjective, or objective feeling of warmth is changed. When all these relations are examined and obtained, we shall not only be able to explain the individual symptoms of the fever, and, consequently, the disease itself, but we shall then also be enabled to trace all to a final and sole cause (the cause of disease.) This is the course of natural enquiry.

ERRONEOUS CONCLUSIONS DRAWN FROM BRINGING ONE CAUSE TOO PROMINENTLY FORWARD.

Erroneous combinations of conclusions of another kind are formed, when in the explanation of a natural phenomenon we only keep in view

one of the many causes on which it is dependant, ascribing to it an active importance which it does not possess in and for itself, but merely receives from the presence of other causes. Thus, for instance, Schleiden bases his theory partly upon an untenable atomism, partly upon false mechanical principles, when he says, in his "Elements of Scientific Botany,"* "that fermentation and putrefaction are the effects of the communication of a motion, and that the amount of the motion will be measured by the product of the mass into the velocity. One part of diastase is said to extend its decomposing power over 1000 parts of starch (but this is an error, since, according to Guerrin Varry, one portion of diastase acting upon 60 of starch, gives only 10.3 of sugar. The relation of 16 of starch to 1 of diastase, gives only 14 of sugar.) We must, therefore, assume in an atom of diastase a velocity 1000 times greater than would be necessary for the decomposition of an equal weight of starch. Here we see that a gigantic edifice of crowded hypotheses has been erected upon the most untenable basis, in order to support a false opinion. On the other hand, the objection started as to the impossibility of one body at rest setting another in motion, borrowed from the atomic method of explanation, is likewise physi-

* Grundzüge der Wissenschaftlichen Botanik, 1845, p. 282.

cally false; since gravitation, magnetism, and electrical attraction are nothing but mere examples of motion being imparted by one body at rest to another."

CORRECTION OF SCHLEIDEN'S VIEW.

As to what regards diastase, and its action upon starch, Schleiden has forgotten to take into consideration the time which is necessary to effect the conversion into sugar. The view which he contests, does not presuppose that the molecules of the diastase possess a greater velocity, but that the surrounding deposition of the molecule of starch had gone on while the motion in the diastase molecule still continued, and, consequently, before a state of equilibrium had been established in the latter. Nothing is to be understood by a communication of motion, but that the molecules of starch are kept in contact with the molecules of the diastase, as if they were parts or constituents of it. The action of the diastase in a limited time depends, therefore, upon the number of the molecules of starch that can come in contact with the molecules of the diastase in the same period of time. The number of the molecules of diastase affect the time and the process of its conversion into sugar; the action disappears with the presence of diastase, and by a double or triple quantity of diastase the time of the conversion is shortened,

or a larger quantity of starch is converted into sugar.

THE MEANS BY WHICH MOTION OCCURS.

As to the view advanced regarding gravitation and electricity, as instances of the motion of one body through another at rest, we must take into consideration that a body at rest may pass into a condition of motion in two essentially different modes.

FIRST: BY THE COMMUNICATION OF A MOVING MASS.

1. By the communication of the moving mass of a body already in motion, as by means of a blow—for instance, the action of the hammer on the nail, of water on the mill wheel, or wind upon the sail.

SECONDLY: BY AN ATTRACTIVE OR REPULSIVE FORCE.

2. By the action of an attractive or repulsive force, which is interposed between two bodies. In this the action is always mutual, and the speed obtained inversely proportionate to the masses moved.

CHEMICAL PROCESSES, AS PHENOMENA OF MOTION, BELONG TO THE SECOND KIND.

As one must consider chemical processes as

phenomena of motion, it is not to be doubted that all such processes as can be explained by the formation of new compounds belong to the second class of phenomena of motion, while the attractive force of the constituents, or their chemical affinity, calls forth the change of place and property (that is the motion) of matter. After the establishment of the combination, motion ceases, as when the falling stone has reached the ground, and the iron filings the pole of the magnet.

PUTREFACTION AND FERMENTATION BELONG TO THE FIRST ORDER OF PHENOMENA OF MOTION.

But when a body which is undergoing decomposition, that is, whose parts are in a state of change of place and of motion, converts another body into a similar condition; and if observation have shown that all other known causes, excepting one alone, must be excluded from any participation in the change, or decomposition of the second body; and if it be proved that this one cause (communication of motion, friction, a blow, &c.), have a decided share in the formation and decomposition of a number of combinations, this one cause must be regarded as the final acting one, especially, if the views gained in the theory of motion, be applicable to chemical actions. The recognition of this last, and only cause, is therefore not a mere word that has been sub-

stituted for the term "catalytic force;" but the expression of an idea, which is strictly the opposite to that of a catalytic body. From the facts advanced in (2) p. 84, the erroneous conclusion is drawn that gravitation, magnetism, &c., are examples of the motion of one body through another at rest.

THE FORCE OF GRAVITATION GIVES NO RISE IN ITSELF TO MOTION.

A clock is kept in motion by the weight but cannot draw it up by itself, and the heat of the sun has as little share as gravitation in the action of a mill-wheel. The water which impels the mill-wheel was previously vapour—the vapour was fluid water.

The water underwent evaporation; the vapour, on the abstraction of heat, became again aqueous, and this liquid water falls by the action of gravitation, and continues to fall until, as in the clock, resistance arrests its motion.

WANT OF CORRECTNESS IN EXPRESSION, THE CAUSE OF ERRONEOUS CONCLUSIONS AND MISUNDERSTANDINGS.

Besides the erroneous conclusions and methods of investigation which are comprised in this one clause, there is yet one individual fault to be added, which prevails amongst many physiologists,

and which can be explained only on the plea of carelessness. This failing is to regard things or phenomena, that have been perceived by the senses, as representing conclusions of the mind, which brings along with it this great disadvantage, that in order to esteem a fact as true, these naturalists require to have ocular demonstration of known causes which cannot be perceived by the senses.

From this it may arise that chemists, in spite of a superabundance of the most evident facts, are frequently unable to convince physicians of the simplest truths.

EXAMPLES.

Examples of this assertion can be found in every physiological work, and I will give a few illustrations from one of the most recent treatises. Valentin says,* "We perceive on dividing the facial nerve that the muscles of the face on the corresponding side are paralysed as far as the will is concerned. We thence justly conclude that the effects of our will are communicated by means of the facial nerve to the muscles of expression.

"We find after injury of the trunk, or the branch of the fifth pair of nerves supplying the eye, that secondary inflammation, suppuration,

* Manual of Physiology, Brunswick, 1844.

and even further, destruction of the globe of the eye are occasioned; and conclude, therefore, that the integrity of the above-named nerves is necessary to the normal condition of the eye."

Further on at page 3, we find as follows: "I know that the walls of the arteries are elastic, and I may, therefore, at once conclude that they distend to a certain extent as soon as they have been filled with blood; and that on the yielding of the pressure they return to their original circumference," that is to say, they are elastic.

POINT OF CONTACT BETWEEN PHYSIOLOGY AND CHEMISTRY.

I have shown in the above, how much the difference in the way of viewing things, adds to the difficulty of arriving at an understanding between physiologists and chemists; and I will now endeavour to consider more particularly the point of contact, at which physiology and chemistry ought to meet in order that they may mutually assist each other.

DEVIATION OF CHEMICAL AND MECHANICAL LAWS FROM THE LAWS WHICH GOVERN VITAL PHENOMENA.

If we endeavour to make use of illustrations derived from the knowledge of mechanical forces, in the enquiry of vital or chemical phenomena, we

immediately observe that the laws which govern the former, differ in many respects from those on which the peculiarities of chemical or vital combinations are dependant.

RELATION OF THE PROPERTIES OF ELEMENTS TO THE PROPERTIES OF THEIR COMBINATIONS.

A chemical combination of two bodies, possesses properties which are entirely different from those of its several constituents. The chemical force of the new body, the power of entering into new combinations, or bringing about decomposition, is not the sum of the chemical forces of its elements. We are entirely unable, by tracing backwards, from the properties of a muscular fibre, to decide concerning those of carbon, hydrogen, nitrogen, and its other elements; and yet nothing can be more true than that certain relations remain permanent between the properties of the elements, and those of their combinations.

Cinnabar is a metallic sulphuret, which possesses totally different properties from sulphuret of lead on sulphuret of zinc. It cannot be doubted that their difference is dependant upon the fact of mercury being combined in the first, lead in the second, and zinc in the third, with sulphur; and that the properties of the mercury, lead, and zinc must have an entirely definite and definable share in the difference of the properties of their com-

binations, since the latter are evidently dependant upon the difference. We see this the most clearly in the isomorphous substances ; sulphuret of lead is scarcely in appearance to be distinguished from seleniuret of lead, sulphate of alumina and ammonia, from sulphate of alumina and potash, selenate of soda, from sulphate of soda. The relations which exist between the chemical and physical properties of the elements have remained constant in many of these combinations ; and in those, where there is a deviation in colour, solubility, &c., one property, namely, physical form, remains constant. The same or a similar relation is doubtlessly attainable between the properties of all elements and their combinations, and all the efforts of chemistry have been directed to the discoveries of these constant relations. An investigation of this kind is the only way in which chemistry can attain to natural laws, and it is only by the same means that physiology, if it is to rise to the rank of a natural investigation, can gain a scientific basis.

THE CHEMICAL FORCES OF THE ELEMENTS HAVE A SHARE IN THE VITAL PROPERTIES.

We cannot, certainly, as yet follow out any physical property by means of the laws, or properties of the elements ; but still there can be no question that a knowledge of such properties is

to be gained from laws, which arise, when these elements have been, in a certain measure, arranged. When these elements have combined to form an animal or vegetable substance, when they have attained to physiological or vital properties, then the chemical forces, which have given them their original properties are no more destroyed or removed, than the cohesive power of the atoms of sulphur is destroyed when we melt a portion of that substance. There has only been another cause superadded—heat—which has removed the effect of the cohesive force, or the connection, rendering its action no longer perceptible. The new condition, that of fluidity, is one of equilibrium between two antagonising causes, an effect in which both have an equal share.

In vegetable and animal substances, the elements obey mechanical and chemical laws, if their action be not removed by resistances, which must be regarded as the indications of new laws, that govern the parts of the organism.

THE RELATIONS BETWEEN CHEMICAL AND VITAL EFFECTS MUST BE INVESTIGATED.

If by the connection of many causes, new laws and phenomena are brought forward, which have no resemblance with the actions of individual causes in themselves, the effects of the latter stand in an immediate relation to those of the new phe-

nomena, and these are the relations which must be sought and investigated.

When we have gained a clear conception of these, we shall be able to decide concerning a number of unknown facts or phenomena, as in the case of isomorphous substances, without further observation.

THE RELATION OF THE WEIGHTS OF THE ELEMENTS TO CHEMICAL COMBINATIONS.

A purely scientific character has been imparted to chemistry by the knowledge of the fact, that the property of weight in all chemical combinations is constant, and that in whatever manner the elements may be composed, the weight of the combination is equal to the sum of the weight of its elements. The knowledge of chemical proportions has led to our being able to predetermine all possible combinations of a body, but it could not explain the apparent exceptions of bodies, which, according to experience, united not in constant, but in every conceivable proportions. It is by the consideration of another property—the relation of external form to composition—that we have not only been enabled to give an explanation of these deviations, but have also gained a far clearer conception of the cause of the constant relations of combination.

THE UNIVERSALITY OF LAWS OF MUTUAL DEPENDANCE IN NATURAL PHENOMENA.

The advances made in all branches of natural investigation, in the physical sciences, as well as in

physiology, rest upon the conviction that similar laws, based upon conditions in the properties of bodies reciprocally depending upon each other, may be obtained.

THE WAY TO ATTAIN TO A KNOWLEDGE OF THE RELATIONS OF DEPENDENCE.

There is no other method in natural investigation by which we can arrive at a knowledge of the relations in which the properties of bodies stand to each other, than by first seeking to learn these properties themselves, and next, the cases in which they vary. It is a law of nature, that the deviations in a property are, without exception, accompanied by entirely similar changes in another property; and it is perfectly clear, that the knowledge of the laws of these deviations, will place us in a position to decide concerning the one property, without any further observation of the other. The knowledge of the one, will lead to the explanation of the other.

A few examples will be sufficient to prove the truth of these statements.

EXAMPLES OF THE LAWS OF DEPENDENCE—PRESSURE AND THE BOILING-POINT.

It is known that every fluid passes into a state of ebullition under the same circumstances, and at unvarying degrees of temperature; this is so

constant, that we designate the boiling-point as a characteristic property of fluids.

One of the conditions of the constant temperature at which air bubbles are formed in the interior of these fluids, is external pressure; the boiling-point varies with this pressure in all fluids, according to an especial law, increasing or diminishing with the increase or diminution of the pressure. Every boiling-point of temperature has a corresponding and definite pressure, and every pressure a definite temperature. It is known that an acquaintance with the law of the mutual dependence of the boiling-point of the water, and the pressure of the atmosphere has led to our being able, by means of the thermometer, to decide altitudes above the level of the sea, and thus to measure one property by deviations in the other.

THE BOILING-POINT.

The relation in which the boiling-point of fluids stands to their properties is less known. Pyroligneous spirit, alcohol, and the fousel oil of potato spirit are three fluids, possessing very different boiling-points. Pyroligneous spirit boils at 138° F., alcohol at 172° F., fousel oil at 274° F. The comparison of these three boiling-points shows that the boiling-point of alcohol is 34° higher than that of pyroligneous spirit (138°+34° = 172°),

while that of fousel oil is four times 34° degrees higher (138°+4×34° = 274°). Each of these three fluids yields an acid upon oxidation under like circumstances: pyroligneous spirit gives formic acid; alcohol, acetic acid; fousel oil, valerianic acid. Of these three acids, each has its own boiling-point: formic acid boils at 210° F., acetic acid at 249° F., and valerianic acid at 347° F. If we compare these three points, we find that they stand in the same relation to each other, as do the boiling points of the fluids from which these acids have been obtained. The boiling point of acetic acid is 34° degrees higher than that of formic acid, while the boiling point of valerianic acid is four times 34° higher.

A similar deviation in one property shows, as we have remarked, a similar deviation in another. The property to be considered here, is the composition. If we compare the composition of the six several bodies (of the three acids, and the three fluids,) from which they originate by the influence of oxygen, we find as follows: the composition of the pyroligneous spirit is designated by the formula, $C_2\ H_4\ O_2$; that of spirits of wine by $C_4\ H_6\ O_2$; that of fousel oil by $C_{10}\ H_{12}\ O_2$.

If now we designate by R, a quantity of carbon and hydrogen, which belongs to the formula C H., (like equivalents) we see immediately, that the composition of alcohol can be expressed by that of pyroligneous spirit +2 R.

Pyroligneous spirit. Alcohol.
$$C_2 H_4 O_2 + C_2 H_2 = C_4 H_6 O_2.$$

While the composition of fousel oil may be expressed by that of pyroligneous spirit + 8 R.

Pyroligneous spirit. Fousel oil.
$$C_2 H_4 O_2 + C_8 H_8 = C_{12} H_{12} O_2.$$

The formula of formic acid is $C_2 H_2 O_4$, that of acetic acid $C_4 H_4 O_4$, that of valerianic acid $C_{10} H_{10} O_4$. We easily perceive that the formula of the acetic acid can be expressed by that of formic acid + 2 R, the formula of valerianic acid by that of formic acid + 8 R. In accordance with these experiments, a boiling point increased 34° F. corresponds with the occurrence or excess of 2 equiv. of carbon and 2 equiv. of hydrogen, or of 2 R. It may be seen that the relation between this group is constant, and that a conjecture concerning their composition may be made from the knowledge of the boiling point. The boiling point of the formate of oxide of methyle is 96° F., that of formate of oxide of aethyle, 130° F., the difference between the two, 34°. From this it might be conjectured that the composition of the latter differs from the former about $C_2 H_2$ or 2 R, and such is the case. The formula for formate of oxide of methyle is $C_4 H_4 O_4$, that of the corresponding compound of aethyle $C_6 H_6 O_4$, and therefore about $C_2 H_2$ higher. Thus butyric acid boils at 311° F., and its boiling point is, therefore, about three times 34° higher than that of formic acid. The comparison of their formulæ shows that butyric acid may be looked upon as formic acid + 6 R. Toluidine and aniline are two organic bases, both so far different in their composition, that aniline contains $C_2 H_2$, or 2 R more than toluidine. The comparison of their boiling points shows that the boiling point of aniline is 34° higher.

THE LAW OF THE RELATIONS OF DEPENDENCE IS DISTINCT FROM THE CAUSES BY WHICH THESE PHENOMENA ARE EFFECTED.

No one will deny, from these examples, the existence of a natural law for this group, nor can any one doubt that the qualities of a body stand in a definite relation to its composition, and that a change in a quality corresponds with a similar deviation in its quantitative relations. It must be especially noticed here, that the knowledge of this natural law is quite independent of the actual cause, or of the conditions which, taken together, effect the constant boiling point, for we are as ignorant of what relates to the boiling point, as we are concerning the conception of life.

THE BOILING POINT, THE SPECIFIC GRAVITY, AND THE COMPOSITION OF A BODY STAND IN RELATIONS OF DEPENDENCE TO EACH OTHER.

In the above examples we have only touched upon one of the relations of the quality and com-

position of bodies, there being as many of these relations as the body has properties. A law has been obtained for a large group of chemico-organic combinations, by which, from the knowledge of the boiling point, and the composition of the body, it has been established how many pounds a cubic foot of the combination weighs, and that the property of the specific gravity, and consequently of the pressure which the body exerts on equal spaces, stand in a definite relation to two others, which are changed as it likewise is changed.

SPECIFIC HEAT AND ATOMIC WEIGHT.

A similar relation of dependance has been established in reference to the amount of heat which different bodies need in order to rise to the same temperature, and their equivalent weights. It is a well known fact, that different bodies receive a different amount of heat at the same temperature. Equal weights of sulphur, iron, and lead, heated to the boiling point of water, when brought in contact with ice melt a certain quantity of it, but the amount of water produced under these circumstances is very different.

If the quantity of heat were equal in the three bodies, the weight of melted ice must amount to the same in all, but the unequal effect which is here observed proves the want of uniformity in the active cause. Sulphur melts six and a half times

as much ice as lead, while iron melts four times as much. It is perfectly clear, that when we heat sulphur, iron, and lead at the same difference of temperature, say for example, from (60 to 400) with the same spirit lamp, we should have to consume half an ounce of spirit to heat lead, three ounces and a quarter of an ounce for the same quantity of sulphur, and nearly two ounces for an equal weight of iron.

These differences in the amount of heat required to raise equal weights of different bodies to the same degree of temperature, and which are peculiar to each, are termed their *specific heats*. From the knowledge of the unequal amount of heat, which bodies of equal weights contain, at a similar degree of temperature, we obtain an invaluable rule of proportion, by which we are able to reckon the weights of sulphur, lead, and iron, which contain a like quantity of heat; thus for instance, 16 parts of sulphur will melt as much ice as 28 parts of iron, and 104 of lead, at equal temperatures. These numbers are the same as the combining weights or the equivalent numbers. Like equivalents of these and many other bodies take up a similar amount of heat in order to raise themselves to an equal temperature, and if we consider the equivalents as the relative weights of atoms, it is clear that the amount of heat, which

each atom takes up, or gives off under similar conditions, is the same for every atom, and when expressed in numbers, is inversely proportionate to the weights of the atoms.

It certainly is a singular result that the amount of ice which a body melts, should have served in many cases to define and establish the relations of weight, in which this body combines with others.

SPECIFIC HEAT AND TONE OF GASES.

It may appear still more singular to many that this property, in aeriform bodies, of taking up and giving off heat, stands in a definite relation to the tone produced by blowing gas through a pipe or flute. This is so truly the case that a celebrated naturalist, Dulong, was able to compute by the irregularity of tone, the amount of heat which in a constant volume the gases give out on pressure, and take up on expansion. In order to obtain a clear insight into this remarkable connection, we must recal to mind, the beautiful idea of La Place, concerning the connection of the specific heat of a gas, with its power of propagating sound. It is known that Newton, and many mathematicians since his time, have in vain sought to establish a formula to guide us in the observation of the velo-

city of sound. The formula that was calculated, closely approximated to the result of observation, but there was always an inexplicable difference. As now propagation of sound takes place by means of the vibrations of the elastic molecules of the atmosphere, in consequence of pressure, and subsequent expansion, and as on pressing together the air, heat is liberated, while, on the expansion of the atmosphere, heat is absorbed, La Place conjectured that this phenomenon must have an influence upon conducting the sound; and it was proved, that by making a correction for the specific heat of the air, the formula of the mathematician was free from all errors, and was an accurate expression of the velocity observed.

If now we compute the velocity of sound according to the Newtonian formula (that is, without reference to the specific heat of the air) and if we compare it with the formula of La Place, a difference will be perceived between the two in the length of space, which a sound-wave is computed to traverse in a second. This difference arises from the specific heat of the air—from the amount of heat which, on the propagation of the sound, is liberated from the molecules of air set in motion. It is clear that this difference in the velocity of propagating sound in other gases, which with equal volumes, contain and give out on pressure, more or less heat than the air, must be greater or less than that

of the atmosphere; and it is, therefore, easy to perceive how the numbers, which express these unequal velocities in the propagation of sound in different gases, afford us at the same time a standard by which to measure the unequal quantity of heat which they contain.

As now the heighth or depth of the tone depends upon the number of vibrations of a sound-wave in a second, that is, upon the velocity with which a motion once impressed propagates itself, and we know that in all gases the velocity of the propagation of a sound-wave is directly proportionate to the number of vibrations of the tones that are called forth thereby, we perceive how, by the unequal heighth of the tone which is brought out by means of a pipe from different gases, (that is by ascertaining how much more one gas contains than another) we are able to find the specific heat of the gas. Acoustics owe the rank they hold at the present time to the great discovery, that musical harmony —each tone that touches the heart, attuning it to joy, or animating it to courage—is the symptom of a definite and definable number of oscillations of the molecules of the propagating medium, and a sign of all that can be determined according to the laws of undulations of this motion. A number of facts referring to tones might be drawn from the theory of undulation, while empirical truths have led to a corresponding knowledge of the properties of vibrating bodies, which were previously quite unknown.

It is asserted of a celebrated Viennese violin maker, that he was accustomed to select the wood for his violins, by making choice of those trees, which, on his striking them with a hammer, returned a certain sound, known to himself alone. This may be a mere fable; but there can be no doubt, that he knew the importance of selecting boards for the upper and lower parts of his instruments, which should make the same number of oscillations in a second, and that this property depended upon the thickness of the boards used.

ELECTRICITY AND MAGNETISM, MAGNETISM AND HEAT, MAGNETISM AND CHEMICAL FORCE.

If finally we consider that the electrical current passing through a metal wire stands in a peculiar relation to the magnetic properties which it receives; and if we remember that, by the magnetic needle the minutest differences of radiated heat may be detected, that the quantity of electricity in motion is expressible in numbers by means of the same electrical needle, and can be measured in cubic inches of hydrogen, and by metallic weights, and that finally when we see how the causes or forces, from which the properties of bodies and their capacities to

make an impression upon our senses stand in a relation of mutual dependence to each other we cannot doubt that the vital properties are equally dependant with all others upon these laws, and that the chemical and physical properties of the elements, with their form and method of arrangement, play an appreciated and appreciable part amongst the phenomena of life.

VITAL PROPERTIES ARE NO EXCEPTION TO A LAW OF NATURE.

It doubtless arises from the method they have adopted, that many physiologists and pathologists are led to look upon vital properties as in some degree exceptions to a great natural law; for how else can we explain the fact of their not regarding the number and grouping of those elements from which the parts of the organism have been composed as a physical property affording indispensable assistance towards the attainment of an insight into vital phenomena; how else can we explain their not taking into account, in the treatment of disease, the elementary composition of the means of cure, and the properties depending upon them, on which their action rests. The mere knowledge of a formula is not of course sufficient for this object, but it is necessary to the investigation of the laws of the relations in which the composition and form of nutrition, or of the secretions stand to the *nutritive*

process; or the composition of remedial agents to the effects which they exercise upon the organism.

ANATOMY MOST ESSENTIAL.

It is certain that all advances of the physiology of plants and animals, from the age of Aristotle to the most recent times, have been facilitated by the progress made in the study of anatomy. As he must remain in the dark concerning distillation, who has seen nothing connected with the process but the still, the fire, and the worm, from whence the spirit flows, so will it be impossible to gain an insight into any process without a correct knowledge of the apparatus used. How much more then is this the case with the human organism, which is a complex apparatus, requiring a most accurate knowledge of the structure of individual parts, before one can venture to form a judgment of the signification of the functions of the whole.—(*Schleiden.*)

We must not, however, forget that anatomy alone, from the days of Aristotle to Leuwenhoek's time, has thrown but a partial light upon the laws of the phenomena of life, as the knowledge of the apparatus of distillation does not instruct us alone concerning its uses; so in many processes, as in distillation, he who understands the nature of fire, the laws of the diffusion of heat, and of evaporation, the con-

struction of the still, and the products of distillation, knows infinitely more of the process of distillation than the smith himself who made the apparatus. Each new discovery in anatomy has added acuteness, exactitude, and extent to its descriptions; unwearied investigation has almost penetrated to the inmost cell, from whence a new road of enquiry must be opened.

ANATOMY NOT ALONE SUFFICIENT.

If, however, as many think, the further advance of physiology is alone dependant upon the perfecting of our knowledge of the anatomical structure of organisms, chemistry can then in no way assist physiology, since its department is not to consider the form, but to establish the condition and relations of forms to their elements, and their methods of arrangement.

By a knowledge of the anatomical structure and relations of the body, anatomy alone is aided, and even by the most accurate investigation into the phenomena of motion in bodies, we shall never learn anything concerning the reasons and laws which govern them. An acquaintance with the mode and direction of motion can alone contribute to our knowledge.

WHAT MUST BE SUPERADDED.

If anatomical knowledge is to serve for the solution of a physiological question, something else must

necessarily be added; and the first thing, surely, is to investigate the matter from which this form was made, the forces and properties co-operating with those of life, and the knowledge of the origin of matter and of the changes which are experienced, before those relations can be learnt, in which all constituents of the organism, the fluid as well as the solid, stand to each other. Many physiologists deem that the important questions which chemistry has solved upon this subject, only enrich herself, although all these results take as low and subordinate a place in chemistry as those that have been acquired by the analysis of minerals and mineral waters.

CHEMISTRY ALONE IS NOT SUFFICIENT.

Another fundamental error entertained by others is, that one may attain to an explanation of vital phenomena by chemical and physical forces alone, or in combination with anatomy; it is, indeed, scarcely to be supposed that the chemist should be able merely by the knowledge of chemical forces to explain the existence in the living body of new laws and new causes, or that the physiologist, setting aside the action of chemical, or purely physical forces, should endeavour to account for every process by the aid of the laws of inorganic nature.

The latter view is the ultimate consequence of a

reaction from the previously entertained views. In a period of philosophical physiology not very remote from the present day, every thing was explained by vital force. This theory was next wholly rejected, and the possibility assumed of our being able to trace all vital processes back to physical and chemical causes. "In the living body," thus wrote physiologists forty years since, "there are different laws at work from those which govern inorganic nature. All the processes of the living organism are of a peculiar character."

In the present day many physiologists, on the contrary, regard these various processes as similar in character. The evil of both these theories is, that neither then, or now, has any attempt been made to establish, or even to investigate the deviations occurring in the effects of vital force, and in the action of inorganic force, or to determine their similarity and differences.

The deductions drawn were not based upon a knowledge of the difference, or similarity of their mutual relations, but upon ignorance of these characteristics.

WHAT IS MEANT BY CHEMICAL FORCE.

Those philosophers who regard vital processes as effects of inorganic forces, entirely forget that the expression *chemical force* means nothing more than the *quantitative* character of different vital

indications, and the qualities dependant upon these quantities. The false view taken of the influence of chemistry in explaining vital phenomena arises from one of two erroneous estimates of the science, either depreciating its effects unjustly, or entertaining too exaggerated an idea of its importance.

RELATIONS OF DEPENDANCE CANNOT BE ESTABLISHED BY A NUMERICAL SYSTEM.

If a definite connection exist, or be discovered between two facts, it does not fall within the province of chemistry to prove the connection, but simply to trace out and express its numerical character.

No relation can be established between two facts by means of numbers if that relation does not exist; and hence the importance of the numerical system.

NUMBERS ARE ONLY EXPRESSIONS OF THE RELATIONS OF DEPENDENCE.

Bitter oil of almonds and benzoic acid are, considering their occurrence and properties, two totally different organic combinations.

A few years since, no mutual relation was even suspected to exist between the two; but now it is known that oil of bitter almonds becomes solid and crystalline in the air, and that the resulting body is identical in its properties and composition with benzoic acid. The relation between these

two bodies is undeniable after this experiment. Observation shows, that in the transition of oil of bitter almonds into benzoic acid, oxygen is taken up from the air, and an analysis of the two firmly established the conversion numerically, and thus explained it, as far as it would admit of explanation.

In a similar manner, by the study of the changes which the oxygen exercises upon fousel oil from potato spirit, a definite relation was discovered between this body and valerianic acid, and it was established by numbers, that one bore the same relation to the other, as alcohol to acetic acid.

CHEMICAL RELATIONS BETWEEN UREA, URIC ACID, ALLANTOIN, AND OXALIC ACID.

The urine of man contains urea, and frequently uric acid: while the urine of some animals is deficient in uric acid, and that of others in urea. The quantity of urea in the urine diminishes with the increase of uric acid; the urine of the fœtus of the cow contains allantoin, while in the urine of man, oxalic acid is scarcely ever absent. A change in certain vital processes of the organism, is accompanied by a corresponding change in the nature, quantity, and character of the combinations, which are secreted by the kidneys. It then remains for chemists to express, quantitatively, the relations in which these bodies are observed to stand to each other, and to the processes in the organism.

THE METHOD PURSUED BY CHEMISTRY TO EXPRESS THESE RELATIONS.

Chemistry first tests, by analysis, the quantitative signification of the terms urea, uric acid, allantoin, and oxalic acid; by this, however, no reciprocal relation is established between them, and it is only by an investigation into the changes which the combinations of those bodies, that have a share in the formation or change in the organism, suffer under the influence of oxygen and water, that a definite and undeniable connection can be numerically established. By the addition of oxygen to uric acid, three products are separated, viz: allantoin, urea, and oxalic acid. By a greater addition of oxygen, uric acid passes into urea and carbonic acid. Allantoin appears as an urate of urea. The comparison of the relations discovered by chemists, in the transition of uric acid into urea, with those which accompany the same process in the organism, has led to the conclusion that the requirements (in this case being an addition of oxygen) are in both cases either similar, or they deviate from each other. And these deviations furnish a new starting point for investigations, which lead to the explanation of the process.

Urea and uric acid are products of the changes which the nitrogenous constituents of the blood suffer, under the influence of water and oxygen.

The nitrogenous constituents of the blood are, in their composition, identical with the nitrogenous constituents of nutrition. The relations of the latter to uric acid, and to urea and the oxygen of the air and the elements of water are expressed in Chemistry by formulæ, which explain them as far as they can be applied.

WHAT IS MEANT BY CHEMICAL FORMULÆ.

It must be evident, even to the unlearned that the difference in the properties of two bodies, is either dependant upon a different arrangement of the elements of which they consist, or upon a quantitative variety in their composition. Chemical formulæ are expressions of the different methods of arrangement, the *quantitative* differences which attend the *qualitative*. Chemistry, even at the present day, cannot by the most careful analysis establish with certainty the composition of an organic body, if its quantitative relation cannot be gained from a second, which has already been ascertained without any doubt; without such aid the formulæ for the oil of bitter almonds and fousel oil could not have been obtained, and if the relation of dependence between two bodies cannot be ascertained by direct observation, the chemist is obliged to find it by his analytic art; this he does by separating the body into two or more products,

investigating those which he obtains from the action of oxygen, chlorine, alkalies, or acids; and by the aid of these he succeeds finally in obtaining one or more products, the composition of which he is acquainted with, and whose formulæ he consequently knows. To the formulæ for these products, he joins that of the body which he has analysed. The sum of the whole is thus obtained by aid of the knowledge of one, several, or all the parts of which the aggregate consists. Thus if the number of equivalents of the carbon, hydrogen, and oxygen, which appertain to a molecule of sugar, are not definable by analysis; and if the skill of the chemist affords no guarantee for the correctness of his analysis of salicine or amygdaline; the analysis may be tested by the fact, that sugar combines with oxide of lead; and resolving itself into carbonic acid and alcohol by fermentation offers two combinations, the formulæ of which are known; amygdaline resolves itself into prussic acid, oil of bitter almonds, and sugar. Salicine into sugar and saligenine.

IMPORTANCE OF FORMULÆ.

It is clear that when the weight of a body, and that of one or two, or all the products resulting therefrom be known, we may determine the number and relation of one, or two, or all its elements, —that is to say we can obtain their formulæ; and

thus the result of the analysis can be verified and corroborated.

REASONS FOR THE CHEMIST TO STUDY THE PRODUCTS OF DECOMPOSITION OF A BODY.

The importance of formulæ to chemistry is clear when considered from the following point of view. A correct formula expresses the quantitative relations in which one body stands to one, two, or more bodies.

The formula for sugar expresses the whole sum of those of its elements, which combine with an equivalent of oxide of lead, and it shows the quantity of carbonic acid and alcohol, into which it resolves itself by fermentation. This will lead us to understand why chemists are often compelled to divide into numerous products the matter, whose composition they wish to establish, and wherefore they study combinations. These are all checks upon his analyses. No formula deserves implicit confidence, if the body whose composition is to be expressed have not been subjected to this operation.

MISUSE OF FORMULÆ.

While some modern physiologists forgot that the knowledge of the relations of two phenomena must precede their expression in numbers, the formulæ of chemists degenerated in their hands into senseless forms of jugglery. Instead of the expression of a genuine relation of dependence, they sought to establish by numbers, relations which either did not exist in nature, or never had been observed. This property, however, does not appertain to numbers.*

HOPES.

The time will come, although perhaps the present generation will barely live to see it, when a numerical expression for chemical formulæ shall have been obtained for the measurement of all the normal

* "Microscopic anatomy shows that in the composition of the brain and spinal cord, there is a mixture of grey and white matter, and that albumen and oil occur together in these organs. Instead of availing themselves of this anatomical fact, chemists have analysed the fat as a whole, that is to say, they have investigated an unknown mixture of albumen and fat. By this means they obtained a peculiar, apparently nitrogenous fatty acid, to which the term *cerebric acid* has been applied, and have sought to establish on theoretical grounds, the anomaly of a nitrogenous fat.

But by a simple chemical deduction, based on Mulder's formula for protein, it is easy to show that we only obtain that which might be naturally expected, namely an evidence that cerebric acid is a mixture of albumen, fat, and phosphorus.

For 1 at. cerebric acid	=	P	C_{178}	H_{179}	$N_{2\frac{1}{2}}$	$O_{20\cdot26}$
	and					
½ at. protein	=		C_{20}	$H_{11\cdot5}$	$N_{2\frac{1}{2}}$	O_6
14·36 at. fat	=		C_{158}	$H_{126\cdot4}$		$O_{14\cdot36}$
18 at. water	=			H_{18}		O_{18}
1 at. phosphorus	=	P				
	=	P	C_{178}	H_{179}	$N_{2\frac{1}{2}}$	$O_{20\cdot36}$

Hence this apparent anomaly in reference to the composition of the brain disappears."—Valentin's Lehrbuch, Vol. I. p. 174.

energies of the organism, and of the deviations in the functions of individual parts by means of the corresponding deviations in the composition of the matter of which these parts consist, or of the products to which they give rise. We shall thus obtain a better means of quantitatively considering the effects which are induced by causes of disease, or by remedial agents, and of more clearly and accurately observing the conditions of vital phenomena. Then, indeed, it will be deemed impossible that there ever was a time, when the share taken by chemistry in the acquirement of this knowledge could be disputed, and when a doubt could be entertained concerning the way and means by which this assistance has been afforded.

THE END.

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PAMPHLETS

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