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Professor Syme,
with the kind regards
of the Author.

LECTURES ON SURGERY.

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LECTURES ON SURGERY

DELIVERED IN

ST. BARTHOLOMEW'S HOSPITAL.

BY

WILLIAM LAWRENCE, F.R.S.,

SERJEANT-SURGEON TO THE QUEEN, AND SURGEON TO THE ROYAL HOSPITALS OF ST. BARTHOLOMEW AND BETHLEM.

LONDON:

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TO WHOSE

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Although I had declined former proposals for publishing my 'Lectures on Surgery,' I have acceded to a similar request from my friend and colleague Mr. Coote, who offered the tempting inducement of his aid in revision, correction, and carrying the work through the press. He has rendered partial assistance in the earlier pages, and would, I am sure, have afforded valuable aid throughout, if I had not soon discovered that an undertaking like the present must be the work of one person. In order, therefore, to relieve him from responsibility in respect to any opinions or statements in which he may not coincide, it is right to mention that he neither saw the greater part of the manuscript before it went to the printer, nor has seen a single page in print before the publication of the book. I take this opportunity of thanking him sincerely for his ready and kind offer of co-operation on this, and for his valuable services on many other occasions.

I have divided the work into Chapters instead of Lectures, as the latter do not correspond with the natural divisions of subjects. The language still retains traces of lecturing, which I have not thought it necessary to efface. I have reprinted from the 'London Medical Gazette' two Clinical Lectures on Syphilis, containing illustrations of some important practical points.

WILLIAM LAWRENCE.

Whitehall Place;
October, 1862.

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Page 346, *line* 15, *for* fourteenth *read* fifteenth.
„ „ 16, „ fifteenth „ sixteenth.

INTRODUCTION.

DISTINCTION BETWEEN PHYSIC AND SURGERY; MODE OF STUDY.

Surgery is one division of the science and art which have disease for their object. This science, considered generally, embraces the physical history of man. It investigates the construction of the human body, and its living actions; it inquires into the purposes executed by each part, and into the general results of their combined exertions. It observes the human organization under all the various modifications impressed on it by surrounding influences of all kinds; and it draws from these sources the rules for preserving health and removing disease. The practical application of these rules constitutes the *art of healing,* or, rather, of *treating disease,* for in many cases we are unable to *heal,* and do not even attempt it; while the assemblage of facts and reasonings on which these practical proceedings are grounded makes up the *science* of medicine.

The boundaries of surgery have not hitherto been, and perhaps cannot be, very clearly defined; and the line of demarcation between it and physic is by no means easily traced. Considering the distinction between them to be a

mere matter of arbitrary usage, I employ the word surgery in its common acceptation; understanding it to include 1st, injuries of all kinds; 2ndly, the greater part of external and local complaints; 3rdly, such internal affections as produce changes recognisable externally—for example, alterations of figure, colour, or consistence; 4thly, all cases requiring external topical treatment, operations, or manual proceedings of any sort. It is of the same kind of subjects that Boyer and Delpech treat, when speaking of external diseases. The title adopted by the latter 'Traité des Maladies reputées Chirurgicales,' treatise on the diseases *reputed* or *considered* surgical, shows that the distinction is not better understood in France than in this country.

It must be confessed that the boundary just indicated is obscure and uncertain. Hence, as in the case of contiguous governments with undefined possessions, disputes have arisen respecting the right to certain portions of territory. Injuries, operations, external local complaints, and manual proceedings, are undisputed possessions of surgery; but it is not easy to distinguish between external and internal diseases; here, in fact, surgery and physic join. Since it is found thus difficult to draw a satisfactory line of demarcation between physic and surgery, you will not be surprised to find, in a great majority of instances, that both are practised together in this country by one description of persons, who hold a double qualification, from examinations by the Society of Apothecaries and the Royal College of Surgeons, and were formerly called surgeons and apothecaries. Nineteen twentieths of disease are under the care of this class of persons in the country, who are therefore not improperly styled general practitioners. On the other hand, in the metropolis and some large towns, the two branches of the profession are partly exercised by two classes of persons, whose education differs in important points. They

are taught by distinct teachers, in separate courses of instruction; and their regulation is intrusted by law to two distinct public bodies, the Colleges of Physicians and Surgeons. Viewing these apparent contradictions, we are naturally led to inquire more narrowly in what the distinction between physic and surgery consists, whether in the nature of the diseases allotted to each, or in the mode of treatment; whether there is any essential difference in the mode of learning them? how and when the distinction arose? whether it is well founded? whether it tends to the advantage of the public, or merely to the benefit of physicians and surgeons?

Nothing like the modern distinction was made by the ancients; there is no trace of it in the Greek, Roman, or Arabian writers. Certain branches of practice were followed separately in Egypt, where the diseases of the eyes, of the teeth, and even of some internal parts, were attended to exclusively by particular classes of practitioners; and some such distinctions existed in Rome; but Hippocrates, Galen, Celsus, and the other medical writers of antiquity, treat indifferently of the nature and management of fevers, injuries, external and internal disorders, and operations. In speaking of treatment, Celsus considers it under three divisions, the same which we still adopt, and mentions these under their Greek names; viz., διαιτητικη (diet, &c.), φαρμακεμτικη (remedies), χειρϑργικη (chirurgical, or manual proceedings). But the idea of splitting medicine into two parts, and of teaching them differently, seems never to have been entertained by this elegant and philosophic writer, nor by those other founders and great promoters of medical science and practice, whose names and works are still regarded with deference and respect.

In the long night of barbarism and ignorance, which intervened between the downfall of the Roman Empire and the revival of letters in the West of Europe, learning and

science were confined to the members of the ecclesiastical profession, to whom we are indebted for preserving those imperfect remains of ancient literature and arts which we still possess. The exercise of medicine harmonised very well with the immediate objects of their holy calling. After the council of Tours, held in 1163, had declared that the Church abhors the shedding of blood (*ecclesia abhorret a sanguine*), priests and monks were obliged to desist from all curative proceedings that involved loss of blood. These were taken up by barbers, attendants on baths, itinerants, and mountebanks. In course of time, surgery, which then consisted merely of bleeding, tooth-drawing, and a few other simple processes, became, with the art of the barber, the occupation of a class of men who were legally incorporated in this and other countries, under the title of barber-surgeons.

The separation of surgery, or one branch of treatment, from that medical knowledge which is the indispensable guide to the time and mode of its application, and its association with the art of the barber, long outlived the circumstances which produced them. In England it lasted till the middle of the last century, when the Company of Barber-Surgeons was legally extinguished, in the reign of George II. The union of the two callings still exists in some parts of Europe.

In order to judge whether there is any well-grounded difference between physic and surgery, it is necessary to advert shortly to the nature of medical science and practice generally.

The numerous individual organs which make up the human body, although various in structure and office, are all intimately connected and mutually dependent. They are merely subordinate parts of one great machine, and they all concur, each in its own way, in producing one general

result, the life of the individual. All the leading arrangements are calculated to give a character of unity to the organization and the living actions of our frame. There is a common source of nutrition for the whole body; a single centre of circulation; a common place of union for all sensations and volitions, for nervous energy of whatever kind. The various organs are not only intimately connected by the share which they severally take in executing associated and mutually dependent functions, they act and react on each other, often very powerfully, either through obvious connexions in structure, or by the hitherto imperfectly-known influences which we call sympathies. Hence the expression of Hippocrates, in relation to the human body, is perfectly correct, *Labor unus; consentientia omnia* (One exertion; all parts concurring.) You could form no adequate notion of one organ, or system of organs, if you insulated it from the rest of the body, any more than you could estimate the use or action of a single wheel or lever detached from a watch or a steam-engine.

As the animal machine, although complicated in structure, is single, and as its living motions, although numerous and intricate, form one indivisible series, so a similar connexion runs through those changes of structure and function, which constitute disease: hence there is *one anatomy and physiology,* and there can be only *one pathology.* If we wish to know any portion of the body, we must not only carefully examine the part itself, but survey the relations of structure and function which bind it to the rest; and if we investigate any class of diseases, we must consider, not only the local symptoms, but also the disturbance which the diseased organs may excite in other parts of the frame, and the influence which other parts may exert over the seat of disease.

It must be the first duty of the medical student to learn the structure of the body and its living actions; that is, to study man in the state of health. These are the objects of the two sciences which are denominated anatomy and physiology. He then proceeds to the observation of diseases; he notices the circumstances under which they arise; he watches their progress and termination; he explores the organic changes which they produce, and learns to connect these changes with their appropriate external signs or symptoms during life; deriving from these comparisons the means of distinguishing the exact seat of disease, and predicting its course and event. These are the subjects of pathology, or the doctrine of disease. The student is now prepared to apply the external influences, such as diet, climate, exercise, the outward or inward remedies, or the surgical operations which may be necessary for the removal of disease and the restoration of health. When disease is studied in this manner, in reference to the whole body, it constitutes the science of general pathology; as a similar investigation, directed to any single organ, is the pathology of that part.

The real question respecting the distinction of physic and surgery is this: after surveying the whole field of disease in the way just mentioned, can you find out any portions insulated from the rest? any division not connected with other parts, which can be understood without reference to them? Can you separate this entire subject of disease into two independent halves, requiring different modes of study and practice? Certainly not. The entire structure and functions are universally and intimately connected. No part is independent. The causes that constitute disease are commonly to be found, not in the part itself, but in other quarters, and the principal means of cure are seldom to be applied directly to the part diseased. For instance, a person is suddenly

attacked with gouty inflammation of the great toe, in severe pain, and great discomfort, with excited circulation, foul tongue, digestive organs and excretions totally disordered; you remedy the general disturbance, and thus cure the attack, possibly without any application to the part. Another loses the use of an arm and leg, in which you find no change, the source of the mischief is in the brain, to which your treatment must be directed. In many cases, disease originating in one part affects many other organs of the body; and the secondary disease thus produced may attract more attention than the original complaint itself. A person experiences an affection of the head, which may be produced by various causes, and, within a short time, the circulating system, the digestive organs, and the secretions, become deranged, and he is in a state of fever. Another receives an injury; inflammation of the part follows, and soon excites general feverishness. The patient may be said to have a sympathetic fever in both cases, and the general disturbance seems of more consequence than the local cause.

Again, although individual organs are numerous, the elements of organic structure are few. The various proportions in which they are combined make the difference, as the various combinations of a few letters produce the infinite variety of words. The basis of nearly all parts consists of the areolar, vascular, absorbent, and nervous structures. Hence, pathological principles are the same for all parts, and, consequently, treatment must be similar throughout. When diseases are arranged in any form, you may strike a line through, so as to divide the mass into two halves, give them different names, and call them distinct branches of science, but they will resemble each other in all essential points: the causes, origin, course, and treatment of the disease comprehended under each, will be the same. If you must have a

division, separate the two sides of the body, or the upper and lower halves. This will, at least, be clear and intelligible; but to assert that surgery and physic are essentially distinct, is to say that there are two kinds of pathology; that the external and internal parts are to be treated on different principles. It would be as rational to say that there are two kinds of physiology, one for the outside, another for the inside of the body. When you know that the component tissues, or organic elements of our frame, are the same throughout, can you suppose that the position of a part in the body can alter the nature and treatment of disease? It may cause differences in the mode of proceeding, thus you have less power of acting locally on internal parts; it may make the pathological investigation of one organ more difficult or easy than that of another; but it cannot alter essential principles. Inflammation, for instance, is the same kind of disturbance, whether in an internal or external part, and we treat it exactly on the same principles, whether it be in the eye, breast, or testicle; in the heart, lungs, or liver. The principles of pathology, therefore, are general; they are the same for all parts of the medical art. They result from our knowledge of health and disease generally, and must, therefore, be common to the physician and surgeon.

The eyes have been intrusted to the surgeon as external parts: yet the organ is the most complicated in the body; and many of its component tissues are highly organized, so that its affections are very much diversified, and require a greater insight into pathology and therapeutics than those of any other single part. The eye, with its appendages, not only contains mucous, and fibrous membranes, muscular, glandular and nervous parts, but also several peculiar tissues. It not only exhibits the various affections of these produced by common disease, but it suffers from gout and rheumatism,

from smallpox, measles, scarlatina, and chronic cutaneous eruptions; from scrofula and syphilis, cancer, fungus hæmatodes, and melanosis. If, therefore, an organ so complex in its structure, and liable to such a number and variety of diseases, can be safely intrusted to the care of the surgeon, I am at a loss to know why there should be any distinction, grounded on the nature of the affections, between the surgeon and physician.

It is in vain, then, to establish separate professorships of external and internal pathology; to institute distinct colleges of physic and surgery; to teach them as separate sciences, and to expect that they shall be practised separately. Lecturers and writers cannot make the distinction; and thus we find the same diseases, in many instances, considered by the teachers of physic and surgery, comprehended in the writings of both; illustrated by both on the same principles, and treated by the same means.

Some have proposed to assign local diseases to the surgeon, general to the physician. It may be questioned whether there are any local or general diseases in the strict sense of the terms; at all events there are few in which the cause has been applied to the part itself, and in which the influence of the disease, as well as of the treatment, is confined to the part; while, on the other hand, there are hardly any in which all parts of the frame are affected. When a part of little consequence in the animal economy is slightly diseased, no sensible effect may be produced beyond the part itself; if, on the contrary, an important organ is actively disordered, many other parts feel the influence; and hence arise what are called general affections. Even in fever we can clearly trace the general disturbance to a local origin in so many cases that the very existence of fever, as a general affection, has been questioned. The difference, therefore,

between what we call local and general diseases, is merely in degree, not in kind: it is a difference of more or less. If we were to arrange diseases in one column, beginning with the most local, and ending with the most general, we should fill up the interval with others forming an insensible transition between the two extremes. Where could we draw the line across, to divide surgery and physic, on a scale thus constructed?

Reverting to the nature and extent of the duties which originally constituted the occupation of the surgeon, and looking to the etymological import of the term, which is *manual operation,* it has been contended that surgery should embrace those cases only in which operations or other manual aid are required. Thus it has been represented, that the province of surgeons is to administer to external ailments; and that among their rules of conduct is included the negative duty of prescribing no internal remedy whatever. Such notions are worthy of the ignorance to which the separation of surgery and physic owes its origin, and of the dark period in which it occurred. Thus this important professional distinction would rest, not on any essential difference in the causes or nature of disease, or in the principles of treatment, but on the accidental and often varying circumstances of the means employed for their cure. What are we to do with the numerous cases, such as serious inflammations, affections of the head, various gouty and rheumatic diseases, in which change of diet and internal remedies are necessary, in conjunction with topical applications, or with the surgical operations of bleeding, cupping, leeching, seton or issue? How shall we dispose of those, in which these different modes of proceeding become necessary in succession; for example, in retention of urine or hernia? In the latter, a series of manual proceedings, topical applications, and internal ad-

ministrations, employed either successively or in conjunction, is often followed by a surgical operation. In many instances it is a mere question of degree, whether internal remedies shall be trusted to alone, or whether bleeding, cupping, leeches, &c., shall be added. Thus a slight affection of the head may be removed by purgatives and abstinence; while a more serious degree of the same affection may require, in addition, abstraction of blood, either generally or locally; or indeed an opposite method of treatment, by the administration of stimulants.

If it is meant to confine surgeons to operations and manual proceedings, and thus to reduce surgery to a mere mechanical department of the healing art, I must enter my strongest protest against the arrangement. It would be degrading to exercise this kind of barber-surgery, while the office of teaching it would present no attraction. If our profession were reduced to this, it would no longer be necessary to study its scientific principles. We might spare ourselves the trouble of learning anatomy, physiology, pathology, and therapeutics; and we might well resign into the hands of our old associates, the barbers, the contemptible remnant to which surgery would then be reduced.

In considering the subject historically, we cannot deny that surgery consisted originally of this limited, mechanical, and subordinate department, which was exercised under the direction, and by the permission of physicians; but surgeons have long emancipated themselves from this bondage, and will never again submit to such ignominious trammels. They have cultivated, with ardour and success, the scientific foundations of their art. They can adduce the rapid progress of surgery since the middle of the last century, and its present undiminished rate of progression, in proof that their claims on the confidence of the public are not inferior to

those of any other branch of the medical profession. They can point out, in their modern annals, the names of many who have been the largest contributors to the advancement of medical science. Among these may be mentioned that of Mr. Pott, so long a surgeon of this hospital. He was an able practitioner, a clear and elegant writer; and has been regarded, both abroad and in his own country, as one of the great modern improvers of surgery. He, however, is thrown into the shade by the transcendant merits and more brilliant reputation of his contemporary and rival, John Hunter, the greatest man in the medical profession, either of ancient or modern days, without excepting even the immortal discoverer of the circulation. In contemplating this extraordinary character, we are at a loss to determine whether he surpassed others most in talent or in industry. The searching glance which he directed into the construction and actions of all living beings, the novelty of his views, and the splendour of his discoveries, strike us with astonishment; but observe the amount of his labour! we can hardly believe it possible that the treasures of his museum could have been formed by one person. To these great names we may add that of a kindred spirit, who entered with ardour on the path they had pointed out, and followed it into new regions of speculative and practical knowledge; I mean the founder of this school, Mr. Abernethy. Fellow-labourers in the same cause have not been wanting in France, Germany, and Italy. It will be sufficient to enumerate Jean Louis Petit, and the other members of the French Academy of Surgery; Desault, Richter, Bichat, and Scarpa. The two latter have been among the greatest contributors to the progress of anatomy and physiology since the time of Hunter.

A knowledge of the structure and functions of the body is the basis of all rational medicine. Doctrines, systems, and

theories, which will not bear examination by the test of anatomy and physiology are only to be regarded as random guesswork or idle dreams. No one would attempt to mend a clock, watch, steam-engine, or the commonest piece of machinery, unless he understood its construction, unless he knew what we may call its anatomy and physiology, that is the nature of the materials which compose it, the configuration, adjustment, and mutual action of the parts. Yet persons are constantly attempting to rectify the disorders of the human machine, not only with a slight and vague knowledge of its construction, but even in perfect ignorance of it, although, as a piece of machinery, the human body is far more complicated than any instrument of human fabrication.

No man who aspires to a scientific knowledge of his profession can neglect the sciences of anatomy and physiology, because they afford the foundation and criterion of all medical doctrines; but correct anatomical knowledge is especially necessary to the surgeon as a preparation for his ordinary duties; without it he cannot determine the seat and nature of disease; he cannot distinguish between the affections of contiguous parts; he cannot understand the varied nature and appropriate treatment of injuries, such as fractures, dislocations, or wounds of blood-vessels and other soft parts.

If you ask how much knowledge of anatomy is necessary for a surgeon, the answer is short, as much as he can get. Your study of anatomy must be general; it must embrace the whole frame, unless indeed you should know of any part which is out of the reach of injury, or exempt from the attacks of disease, or any region which can never be the subject of operation.

Operations, may in some instances, be executed mechanically, by following certain rules; but if things do not go on exactly according to the description, the operator, ignorant

of anatomy, is immediately confused, embarrassed, frightened. In most cases, too, unless the knife be guided by minute anatomical knowledge, operations are attended, not only with unnecessary suffering and risk to the patient, but also with the greatest danger to the reputation of the operator.

I trust, gentlemen, that you will not be anxious to discover how small a stock of scientific knowledge will enable you to carry on the trade of surgery. Your more honorable course will be to render yourselves accurate anatomists, as the most essential step towards becoming good surgeons. The health, the limbs, the lives of our fellow-creatures are intrusted to our care, with a confidence in our knowledge, skill and humanity; our utmost exertions in the acquisition of knowledge will not do more than enable us to undertake this serious responsibility. What kind of feelings, what conscience can the man possess who can plunge an instrument into the human body without knowing what he may divide or injure, who can operate without that full anatomical knowledge that will enable him to meet every emergency? How could he bear his own reflections, if serious and permanent injury or loss of life, should ensue, as the consequence of his ignorance and rashness?

But the study of anatomy and physiology does not make us acquainted with disease: you may know the structure and functions of an organ perfectly, and yet be ignorant of its diseases. How then are these to be learned? Not from lectures, nor from writings, but by studying the great book of nature. You must frequent the hospital and the sick chamber, and observe diseases for yourselves. Lectures and books are auxiliaries, and, under certain circumstances, useful ones; but they are of secondary importance, compared to the actual observation of disease.

To know disease, then, you must see, examine, and closely

watch patients; you must observe the origin and progress of the altered functions during life, and then investigate, after death, the changes produced in the organization. Here your knowledge of anatomy and physiology will be of the greatest service. How can you appreciate the effect of disease, unless you know the healthy structure? How can you refer the altered functions or symptoms to the organic changes which have produced them, especially in internal organs, unless you know the healthy functions? The general doctrines of disease and treatment can only be judged by the lights of anatomy and physiology; the greater portion of medical theories is obviously unable to bear this scrutiny, and may be at once dismissed.

The wards of an hospital are the best school of medicine; and clinical study, under the guidance of a competent teacher, is the best mode of learning. You will immediately inquire whether it is not necessary to hear lectures and read books before you begin to see patients. I advise you to resort as early as possible to nature, to that source from which the masters of our art have derived their information; from which lecturers and authors must draw their knowledge. Here it may be said with perfect truth *Juvat integros accedere fontes atque haurire.* In learning anatomy, you have the facts demonstrated to you by the teacher, and you examine and explore them for yourselves by dissection. In the same way, demonstration of the phenomena of disease on the patient by the teacher, and the actual observation of them by the learner, are the only means by which real knowledge of the subject can be acquired. The facts thus presented to the senses make a stronger impression than any description, even by the ablest lecturer or writer; while the information which a person thus acquires for himself from nature can always be depended on, and is never forgotten.

Between him who has only *read* or *heard*, and one who has *seen*, there is the same difference, in point of knowledge, as between a person who has merely perused the description of foreign countries, and another who has actually visited them. To secure these advantages to their full extent, instruction should be strictly clinical, that is, the symptoms of disease, and the changes it produces, should be actually pointed out and explained on the patient; their origin, progress, and connexion, should be illustrated, and the indications and modes of treatment should be deduced from the facts thus immediately observed. This kind of clinical instruction can only be given at the time of visit. I have always endeavoured to explain diseases in this manner to the pupils of the hospital, and I shall continue to illustrate clinically in the wards the general doctrines which I deliver in this theatre.

After beginning to observe diseases for yourselves, you may have recourse, with advantage, to lectures and books, which may be of great use in teaching you how and what to observe; in pointing out what might escape observation; in elucidating what may be obscure and perplexing; in rectifying erroneous conclusions; and in impressing the results of observation more strongly on the memory.

I cannot help thinking that too much importance has been attached to lectures. From the long prevalent custom of attending them, and the regulations of the public bodies which require certificates of attendance, before admitting candidates to examination, the belief seems at last to have been produced, that medicine can be learned in this manner. This is a great mistake. The medical sciences rest on observation, and are only to be acquired by resorting to nature. The great number and intricacy of the phenomena are additional reasons why we should examine for ourselves, and not take the facts at second or third hand. A few cases

attentively observed, will teach you more than any lectures or books. If you attend to nature with an unprejudiced mind, you cannot go astray. Lecturers and writers often copy from each other without resorting to the fountain of knowledge: can we wonder that they frequently mislead and deceive instead of instructing?

Whether the student should begin with the practical study of external or internal diseases, or of both together, may depend on accidental circumstances of opportunity or convenience; the most natural order, however, is to take external affections first, and then to proceed to those of internal parts. In the former, the origin, progress, termination, and effects of disease, and the operation of treatment, are obvious to the senses. Here the evidence is clear; and the principles derived from this source must be applied by analogy and induction to the more obscure affections of internal organs. Hence a physician should begin by studying surgery; and he who has made himself a good surgeon, has accomplished much of what is necessary towards becoming a good physician.

Do not imagine, however, that the knowledge of surgery will qualify you to practise physic. Internal diseases, and the more general affections, which together make up the department of the physician, form a very arduous and important branch of study, which will require much time and the closest attention. The obscure nature of inward disease renders its investigation more difficult than that of outward affections. You will, therefore, embrace every opportunity of studying this subject practically, as well as by lectures and books.

Your study of disease, both in nature and books, should embrace the whole range of the subject. To the great majority of you, who will have to act as general practitioners,

this is obviously necessary; you will hardly meet with cases requiring a treatment strictly surgical. I consider a comprehensive acquaintance with the entire circle of medicine equally necessary to those who mean to practice surgery only. If the surgeon is to rank higher in public estimation than the general practitioner, will he rest his claim to this superior dignity on the circumstance of possessing a lower amount of medical knowledge? It is necessary that surgeons should apply, in their own department, the principles and modes of relief deduced from a survey of medicine generally. The manual part of surgery is far less important than the medical; and it would be indeed disgraceful to our profession if surgeons were not competent to the management of surgical cases without the assistance of any other practitioners. Moreover, an eminent surgeon, who has the thorough acquaintance with anatomy, physiology, and the general principles of medical science, necessary to such a character, will be consulted under various circumstances, and more especially in cases of obscurity, difficulty, and emergency. If he says that he has not studied this, that he knows nothing of that, that he cannot direct the treatment of a case under such and such occurrences, what can he expect but to forfeit the confidence of those to whom his ignorance becomes thus exposed.

I do not recommend you, gentlemen, to read many books in the commencement of your surgical studies. Seeing and examining will be more useful to you than reading.

To those who wish to acquire a thorough knowledge of their profession, an acquaintance with the Latin, German, and French languages, is absolutely necessary; as numerous valuable works, on all parts of medicine, are to be found in each of them.

You will understand, from the observations which I have now had the honour of addressing to you, that in selecting

the medical profession you have set yourselves no very easy task. The study of medicine is, indeed, an arduous undertaking. The most comprehensive mind and the greatest industry might find occupation for many years in acquiring the whole circle of medical knowledge; you will have reason to lament that you cannot employ a longer time in the preliminary studies which are necessary as a qualification for the active duties of your profession; and you will therefore see the necessity of improving, with the greatest diligence, the opportunities of information that you now possess, and which you will never be able to recall. Let me observe, at the same time that, among all the various objects which can engage the human mind, there is no better exercise of the intellectual faculties, no more attractive and interesting pursuit, than the study of the medical profession; while its practice has the most salutary moral tendency of repressing selfishness, calling forth and strengthening all the benevolent and social feelings. Our studies embrace all the most interesting parts of natural knowledge. Our first and immediate object is to learn the construction of our own frame, the means by which we live and move, and have our being; we see the nature and operation of those influences by which health is interrupted and restored, by which disease and suffering may be averted. Chemistry, natural philosophy, and natural history, are auxiliary sciences, more or less immediately connected with the primary objects of our pursuits. Thus we are led to the contemplation and study of nature, and the investigation of truth. We are not called upon to defend any doctrines or systems, or to uphold any set of opinions. We have no interests at variance with those of the community. In professional intercourse with our fellow-creatures we are known only as instruments of good; in restoring or securing health, the greatest of blessings, in

removing pain and sickness, which are among the greatest of evils; in soothing the anguish and quieting the alarm which friends and relations feel for each other; in protracting the approach of that awful moment, from which we all shrink back with instinctive dread, the termination of existence. The happiness or misery of life, and the very question of life or death, often hang on our decisions. I trust that, bearing in mind the serious nature of those duties, you will be anxious to employ the short period of your studies to the greatest advantage, and allow no opportunity of gaining knowledge to pass unimproved; you will thus become respected members of an honourable profession, and prepare for yourselves, in the decline of life, the sweetest of all rewards—the retrospect of labours devoted to the good of others.

CHAPTER I.

ON THE NATURE AND DIVISIONS OF DISEASES; THEIR ARRANGEMENT AND CLASSIFICATION; NOSOLOGY.

It is the object of medicine to ascertain the nature and seat of diseases, in order to discover the causes, best means of prevention, and treatment. If we understood in each instance what organs are the seat of disease, and how they are affected, there would be little difficulty as to the subject of treatment. We should then be able to give an appropriate name to each disease, and to arrange them according to their natural affinities, that is, we might establish a rational nosology, or systematic catalogue of diseases.

It happens unfortunately that in many instances we are unable to determine the nature of disease, while in others we cannot discover even its exact seat. Hence the names of diseases are in many instances calculated to mislead, and those mere catalogues which are called nosologies are really worse than useless. The difficulties, however, to which I allude, are not so great in that part of the subject which is our present object, viz., the surgical department. They are more forcibly felt in the affections of internal organs which, being situated at a greater or less distance below the surface, are withdrawn from direct observation and examination, so that their precise condition in the first instance, and the changes they undergo from treatment, are often little more than conjectural.

Most persons imagine that they understand the meaning of health and disease; yet it is not altogether easy to give a satisfactory definition of these two states. Health and disease have been said to be two opposite states, and under many circumstances this representation is correct. For example, a person in full health may be truly represented as in an opposite condition to that of a person in fever. However, health and disease are not simply two states that can be thus compared; for under each is included a great variety of conditions differing materially from each other. On one side health passes, by an insensible gradation, into disease; and on the other disease in the same way is shaded off if I may use the expression, gradually into health; so that when we survey the conditions which approach to each other, we find considerable difficulty in determining what is health and what is disease.

The human body consists of numerous organs, each executing its own particular function, and all concurring in the general purposes of organization, which are to preserve life, to keep up the relations which connect the individual with the surrounding world, and to continue the species. When the organization is perfect, and the functions are regularly executed, the individual is said to be well, or in a state of health: the notion of health, therefore, combines the two circumstances, perfect structure and perfect functions. The word natural, as applied to the healthy structure, is rather equivocal, for we must admit that disease is a part of nature. The French and the Germans use the word normal, to denote what we call the healthy structure. This term (from *norma*, a square, a rule) is about equivalent to the English epithet healthy; thus the normal, or healthy structure, and the regular execution of functions would be opposed to disease, which implies altered structure or irregular function.

Disease has been defined an improper or irregular execution of one or more functions of the body. This, however, is objectionable, as omitting what is of primary importance in the consideration of disease, namely, the state of the organs. The definition, however, is correct as far as it goes; for wherever we see an irregular execution of any function, we may safely conclude that disease exists; but we may have disease, and that of unequivocal kind, existing in the body without any observable deviation from the natural state of the functions. Warts and corns are considered to be diseases, and at all events, steatomatous tumours are so; yet these may arise, and even acquire considerable size, without the individual being aware of their existence; and, even when they have arrived at considerable magnitude, they do not necessarily disturb any function, being only inconvenient by their bulk. Even so formidable a disease as cancer affecting the female breast may begin and go on so insensibly as to attain some size before the female is aware that any change has occurred; and the presence of the disease is discovered accidentally.

Disease may be called a deviation from the normal, regular, or healthy state of any organ or function, or of the fluids secreted by any part. This may be exemplified in the stomach. It may be affected with inflammation and cancer; and in both cases there is a manifest change in structure; in the former temporary, in the latter permanent. In indigestion (dyspepsia), nausea, sickness, the function of the stomach is impaired, and the organ fails in its office. In heart-burn and water-brash an acid secretion is poured into the cavity, while in yellow fever a strange, dark, more or less fluid substance, resembling coffee grounds, and called black vomit, is thrown up.

You will perhaps be inclined to think that the three cir-

cumstances combined in the definition now mentioned might properly be reduced to one, altered functions and secretions necessarily implying changes in an organ. I can entertain no doubt that if our knowledge of diseases were perfect, we should be able to trace in every instance altered functions or secretions to changes in the state of organs. Unfortunately, we not unfrequently see impaired function when we cannot ascertain the condition of the organ, more particularly in internal diseases, while in other instances there are manifest symptoms of disease, without our being able to determine its exact seat. In this imperfect state of knowledge we are obliged to admit alterations of function and secretion as diseases, and to give them names without implying that the changes take place independently of alteration in the organs. Thus it happens that nosological catalogues contain in addition to the names of well-ascertained and localised diseases, an abundance of others which denote mere symptoms.

In considering the morbid changes which the body may undergo, we must bear in mind that they differ much in degree. There may be change of such a kind that the alteration will be visible after death, or it may merely affect the living condition, and leave no traces distinguishable after death. I do not mean to represent that the function of an organ can be altered, while the organ itself remains in a perfectly healthy state; for what are functions? merely the organs in a state of exertion. Perfect functions imply a normal condition of the organs, and *vice versâ*. To say that functions are disordered without any change in organs, would be to assert that an effect had taken place without a cause.

The morbid changes that may take place in the body may be divided into the more serious, which are visible on examination after death, and, the slighter, which affect

merely the living condition of the parts, and are not ascertainable after death. The living condition of an organ which is necessary for the regular execution of its function comprises not only the structure as seen after death, but also a proper supply of healthy blood, and an uninterrupted exercise of that influence which connects the part with the nervous system, and in many cases, sympathetically, with other organs of the body. Nearly the whole of the slighter changes elude our observation; so that in many instances we cannot say whether a particular organ is in a condition fitted to exercise its functions properly or not. In some diseases we can see how the organ is affected in its vital conditions, we can observe how it is influenced by this kind of alteration. The functions of the brain, for example sensation, and voluntary motion, will be suspended when the action of the heart is suddenly stopped, as in syncope; or when the function of the lungs is arrested, as in the case of suffocation. Under the former the supply of blood to the brain fails in quantity, under the latter in quality, the necessary change from venous to arterial not having taken place; while in both the structure of the organ is unaltered.

When, therefore, we speak of diseases being functional, we mean merely to express that we can observe no change of structure in the organs during life, nor discover any after death, and we use the word functional in contra-distinction to organic, which denotes visible changes in the organs of the body, ascertainable by dissection. This distinction between functional and organic disease, although often convenient in common language, is loose and indefinite, and hardly admissible in a scientific sense. The term organic, indeed, is used chiefly to denote the more serious alterations of structure which are permanent, impairing or destroying function, and even endangering life, such as cancer, ossification, indurations,

tubercular degeneration. We should be at a loss to make an equally clear enumeration of functional affections, and thus fail in an attempt to distribute all diseases under the two-fold division of organic and functional in any clear and rational ground. Where should we place inflammations and the changes which they often leave behind. In their active state, alterations in the affected organs are obvious enough. In the great majority of cases these are transitory, so that the organs soon recover their normal structure and functions, but in other instances they leave behind more or less permanent changes.

The difference between functional and organic disease has sometimes been marked in our own language by the terms disorder and disease; but this use of the two words is neither sanctioned by their common acceptation, nor indeed by their etymological signification. In common language disorder and disease are synonymous, and used indiscriminately; and if we inquire what is their proper meaning, it seems to be nearly the same. What is disease? It is an interruption of ease, that is, a change in feeling. What is disorder? An interruption of the regular course in which the functions should be executed.

Examination after death is not a perfectly satisfactory criterion of the changes which may have taken place in an organ during life. There are obvious and important changes observable during life, which leave no trace after death. In erysipelas, there is determination of blood to the skin, with distension of the blood-vessels and increased redness; but these appearances are lost after death. In inflammation of the eye, there is external redness, which disappears after death. We cannot, therefore, conclude because we discern no change in the state of the part after death, that no change had taken place during life. Before we can determine that no change

has taken place in the organs, our examination after death must be very accurate, and should be performed with the aid of complete knowledge of the healthy, normal, or regular state of the part. Thus we find that in proportion as pathological investigations after death have been conducted with greater accuracy, the number of diseases supposed to be functional has been diminished. Fevers have been regarded as general disorders without local cause, or as proceeding from disturbed cerebral functions; but the more accurate pathological inquirers of modern times have found out that important organs are more or less seriously diseased, so that the complaint may be removed from the list of simply functional affections. The division, then, of disease into functional and organic, according to the view that we now take, denotes a difference in degree, rather than in essential nature. In diseases called functional, the changes in the organs are of the slighter degree, which leaves little or no trace behind; while in the organic the alterations are more considerable, permanent, and dangerous. To assert that functions are disordered when their appropriate organs are in the normal state, would be the same as if a watchmaker, when our watch goes wrong, should tell us that all its parts and their connexions are perfect, but that the motion is in fault. We should be justly dissatisfied, and recommend him to examine more minutely. In the same way, when medical men are puzzled, they must inquire more deeply and cautiously, in order to find out what may have escaped observation on the first occasion.

This is not a merely speculative point, but one of considerable practical importance; for they who believe in strictly functional diseases direct their treatment according to that view. The endeavour is to remedy the imperfection of the function, to excite the vital properties which seem to be deficient in energy, to rouse those that appear to be dormant;

such treatment being calculated in many cases rather to aggravate than to remove disease. On such pathological views the treatment of palsy would be directed to the loss of power in the paralysed parts, to the neglect of the real seat of the mischief in the brain. In the same way amaurotic affections, regarded as weakness of sight, have too often been treated by tonics and stimuli of all kinds, with the sure result of increasing the disease of the retina and hastening its progress.

At one time the explanation of all diseases turned on the changes supposed to take place in the animal fluids; while, at a subsequent period, all share in the explanation of morbid phenomena has been denied them. In the early period of medical art, when anatomy and physiology were nearly unknown, the enumeration of these fluids was altogether imaginary; and they were supposed to be capable of derangement in variety of ways, chemical and mechanical, analogous to those which fluids might undergo out of the body. All diseases were explained on the supposition of changes in these fluids, and the means of treatment were directed to remedy such supposed alterations. When anatomy and physiology began to be cultivated, and the organic changes taking place in disease came to be investigated by examinations after death, these notions were put an end to; the humoral pathology, as it is called, was hardly spoken of, except in terms of contempt, and the animal fluids were then disregarded in the attempts to explain the nature of disease. The constantly advancing knowledge of anatomy and physiology during the last century, could not fail to rectify notions so completely erroneous; and the really wonderful progress of chemistry in recent times has thrown so much light on all parts of the subject as to convince us that an intimate acquaintance with the nature and composition of the animal fluids is as necessary to sound

notions in physiology and pathology as the study of the solid structures of the body. It was near the middle of the last century, that our countryman Hewson made his laborious and successful examination of the blood, which a modern French physiologist has characterised by the bold but not inapt expression of circulating flesh (*chair coulante*) and not long afterwards Mr. Hunter began those researches on this fluid in all its various conditions of development, health, disease, and accident which constitute the foundation of his principles in physiology and pathology.

All organs may be *primarily* diseased, experiencing disturbance from causes acting on them in the course of their ordinary functions; or they may suffer *secondarily*, in consequence of disease previously existing in some other parts. Boiling water or a blister applied to the skin, or a wound, will cause inflammation as their primary effects. When the stomach is disordered by particular articles of food, such as shell-fish in some individuals, or otherwise overloaded, inflammation of the skin may be excited, in the shape of nettle-rash or erysipelas, as a secondary affection. Determination of blood to the head, excessive or long-continued mental exertion, will cause giddiness or other forms of cerebral disorders, while similar symptoms may be brought on by a disordered stomach or overloaded bowels. Primary disease is also called *idiopathic*, as being brought on by a cause immediately acting upon the part; while the secondary is termed symptomatic or sympathetic, as being caused by the previous existence of disease in some other organ of the body.

Various views have been entertained respecting the secondary affections, which are constantly coming under our notice, with a view to determine the primary disorder to

which their origin should be referred. Some have regarded the liver as a principal source of disease; while the entire alimentary canal has been viewed in the same light by others. These and similar notions are too partial, and therefore more or less erroneous. We must, however, observe that, in proportion to the importance of any system of organs, will be the influence which they exercise in exciting disease in other parts. In this point of view, the digestive system, the stomach, the intestinal canal and the subsidiary organs, will have a greater influence in exciting disturbance in other quarters than most other parts. We cannot, however, regard them as the source of all other diseases. The brain may be disturbed primarily by causes of direct action, such as serious and continued study, intense mental application, anxiety, grief, and distress, and it then becomes a powerful source of sympathetic influence in various ways.

When we say one part sympathises with another, we merely denote the fact that the affections are nearly coincident, and that the second takes place in consequence of the first; so that the physical is analogous to the moral sense of the term. It does not explain how the influence is produced. The pneumogastric nerves account sufficiently for the reciprocal influences of the stomach and head, while the nervous communications in so many parts and the more or less direct connexion of all the nerves with the cerebro-spinal axis explain any sympathies that might at first sight seem obscure. Many sympathies become intelligible by anatomical connexion and continuity of surface.

In examining patients, we have to determine not only what organ of the body is diseased, but also how it is affected; this being a part of the subject still involved in much uncertainty.

In the great majority of cases, diseases consist of a disturb-

ance in the circulation of the part, which, when it has reached a certain point, is called inflammation, as it is commonly attended with some increase of temperature. This disturbance affects the nutrition of the part, and thus causes, by its progress and continuance, more or less change in its component textures, which may be called effects or consequences of the disorder. Inflammations are not all of one kind; and there is one leading distinction which it is necessary to notice in adverting thus generally to the disease. It is divided into *common* and *specific:* the former is produced by ordinary causes acting on healthy constitutions, by a wound, for instance, inflicted on a person in good health. Other external agents will act in the same way. Specific diseases are those in which the constitution of the patient is unhealthy, either from hereditary or acquired imperfection, scrofula, gout, and rheumatism are examples; or they may arise from one definite and specific cause, as in syphilis, smallpox, measles, scarlet fever, and contagious diseases generally; and by no other. Specific inflammation, thus excited, is nearly similar to the common, the difference consisting merely in modifications.

As the vascular disturbance constituting inflammation presents at least an appearance of increased vital activity in the seat of disease, a question might naturally occur, whether cases are not met with of opposite character, where, in short, the circulation is weakened, and the local changes are characterised by debility and want of restorative power. Cold reduces the circulation of a part, and if continued, will arrest vital action altogether; circulation is impeded in the extremities of old persons so as to cause loss of vitality. The state of good health is the most effectual preventive of disease, and, when combined with soundness of constitution, may render a

person almost proof against its attacks. On the other hand, original bodily weakness, and the lowering effects of illness and other circumstances, produce a state in which disease may be excited by the slightest causes, and is characterised by debility both in its origin and progress. There is, however, no general term to distinguish affections of this description.

It might be convenient, in order to avoid controversy, to arrange the affections of each organ on a simple plan not involving any theoretic views of general pathology. Thus, affections of the eye might be taken in the following order: First, injuries; secondly, inflammations, divided into two heads, common and specific; thirdly, consequences of inflammation; fourthly, organic changes; fifthly, functional derangement. We shall hardly find anything that can be said about the diseases of the organ, that is not referable to one or other of these heads. An arrangement of this kind does not take us beyond the extent of our knowledge.

When we do not understand the nature of a disease, it is better to acknowledge the fact at once, and leave the matter for further investigation, than to attempt explanation by an imaginary and theoretical view.

When we have ascertained the seat and nature of a disease, we can give it a clear and expressive name, which shall at once identify the disease itself. Many affections are named in this way; thus the terms peritonitis, enteritis, pleuritis, pericarditis, denote both the nature and seat of the mischief. In many instances our knowledge is too imperfect to admit of diseases being thus named, and then they are designated according to some circumstance that is obvious to observation; thus we have such names as dyspnœa, dyspepsia, dysuria, diarrhœa, dysentery, cholera. Frequently the name denotes merely the pain or altered sen-

sation, as cephalalgia, gastrodynia; or the loss of blood or other discharge, as hæmoptysis, hæmatemesis, hæmaturia, gonorrhœa, leucorrhœa, melæna, diabetes. All these pass in nosology as so many diseases, but they are merely names of symptoms, and thus indicate our ignorance of the true nature of the mischief.

Nosology.—In a subject so extensive, multifarious, and complicated as medicine, rational arrangement and classification are of considerable importance. A methodical distribution of parts could not fail to lessen the labour both of learner and teacher.

Each of the numerous organs composing the body is liable to be diseased in various ways; and every particular affection of an organ has its name, and is regarded as a disease. In many instances an organ is made up of many component structures, each of which is liable to particular forms of derangement, while all of them have received names, and appear in nosologies as diseases. Take the case of the eye. In consequence of its being open to external observation, and of its structure being extremely complex, the forms of disease incidental to its various structures are sufficiently distinct to have received names amounting to some hundreds. You will not therefore be surprised to find that the diseases of the whole body may be made to amount to thousands. The study of disease is not, however, so complicated and endless a subject as this ample catalogue of names would lead you to expect. Although the individual organs of the body are numerous, the component tissues or organic elements of which it is built up are few; the basis or ground-work of nearly all the organs consists of cellular membrane, blood-vessels, absorbents, and nerves. It is the various proportions in which these elements are combined that make the differences of the various organs. Hence, as the essential

basis of the several organs is the same throughout, the morbid affections must be essentially similar.

That part of the science of medicine which considers names and the distribution of diseases into classes is technically called *Nosology*. Diseases have sometimes been considered topographically, that is, according to their situation in the body; and old writers have generally treated them in this way, beginning with diseases of the head, and descending to the other parts of the body. This, at all events, does not involve any theoretic ground of confusion, but it leads to tedious repetitions.

Medical nosologists have generally founded their arrangements on the nature of diseases; and their efforts have, in general, been unsuccessful, because this part of the subject is imperfectly known. Most of these nosologists have been but little acquainted with anatomy and physiology, and therefore their distinctions have in most instances been fanciful, and have been founded on particular doctrines and systems which will not bear examination.

The greatest advantage has been derived in the study of natural history from scientific nomenclature and classification, for which we are chiefly indebted to Linnæus, a man of extraordinary talent, industry, and restless ardour in the pursuit of knowledge, to which he devoted the first three quarters of the last century. He undertook the immense task of naming and arranging all organized beings, and executed it so successfully that his system soon obtained universal currency, and still maintains its ground to a considerable extent. He studied species, and gave them rational names, and then grouped them according to their natural affinities, distinguishing them by their natural differences. The success which attended his efforts in natural history led to attempts of a similar kind in the arrangement of diseases. A nosology was published

by a French physician (Sauvages), in which diseases were arranged in species and genera, and were combined in orders and classes, in the same way that Linnæus had adopted for plants and animals. This arrangement included 10 classes, about 300 genera, and about 4000 species. The example of Sauvages was followed by others; and various systems of nosology were published, which I need not dwell upon at length, for they are now, as they deserve, nearly forgotten. Dr. Cullen, of Edinburgh, published a system of nosology, which was generally adopted, and is still maintained in this country. Yet we find, upon examining it, that diseases are brought together which have no natural affinity; and that, in other instances, those are separated, and put into different classes, which resemble each other. Under the division tumours we find aneurisms, varix, ecchymosis, scirrhus, cancer, bubo, sarcoma, warts, corns, hydrarthrus and exostosis. Dyspepsia, diarrhœa, and dysentery, are in different orders, while hydrophobia, diabetes, diarrhœa, palpitation, and epilepsy, are in the same order. If this be one of the most successful attempts at nosology, we may safely dismiss all of them from further consideration. It is a sign of sounder ideas upon the subject that these systems have fallen into disuse.

The attempt to class diseases on the same principles that are followed in the arrangement of organized beings must fail, because the two cases are entirely different. The species of animals and plants are distinctly marked by the hand of nature, and there can be no difficulty in placing them. Diseases, on the contrary, run into each other by insensible gradations; so that it is often difficult to point out the distinction between them, and in some instances they are differently named by different persons. We are constantly meeting with forms of disease that are not described; and it is a

common observation, that diseases which we meet with in nature are very little like those we read of in books. Thus the primary grounds of distinction, so clear and definite in animals and plants, are altogether wanting in diseases, to which the name of species cannot be applied in the same sense as in natural history. Again, the structure and economy of animals being well known, leading circumstances can be adopted as the ground of their distribution into genera, classes, and orders, so that from the position of an animal in such an arrangement, you understand the principal points in its economy before you are acquainted with the animal itself. This advantage is altogether absent in the case of diseases.

All the subjects either in the animal or vegetable kingdom might be arranged in a single line, beginning with the most simple and ending with the most complicated, or *vice versâ*. Diseases are so imperfectly distinguished and so intermingled, that they would form a sort of network, instead of a single line. Cullen's nosology, therefore, can afford no assistance in acquiring a knowledge of the nature and relations of diseases, and the task of learning what is useless and deceptive ought not to be imposed on students.

As diseases consist of changes in the state of organs, the proper ground of distinction would be anatomy; at all events, this would not involve any error. There are two things to be considered here, the anatomy of form and position, and that of texture. The one is called descriptive, the other general anatomy. The latter shows the composition of the organs: it is a kind of analysis, reducing them into their constituent elements. Bichat, a Frenchman of extraordinary genius, who died at the age of thirty-three, leaving behind him a great name, has explained the anatomy of structure. He has attempted to reduce, in a work called 'Anatomie Générale,' the organs of the body to their compo-

nent elements, and to determine the nature of these constituent parts. He has shown the proportions in which they enter into the various organs of the body, and has subjected them to every kind of analysis, anatomical and chemical. In short, he has produced a work which is truly extraordinary, when considered as the production of a man who died at so early an age. If we knew enough of the elementary structures of which the body is composed, we might estimate the disturbance of each system, and have a natural arrangement of its diseases. In considering diseases on this plan, we should find that much time would be saved; after explaining generally the nature of the affections to which each tissue is liable, we should only have to point out the local circumstances belonging to the diseases of each part. Suppose we take the cellular system; inflammation of this is called phlegmon; proceeding to suppuration, it constitutes abscess. When the phenomena of phlegmon have been once described generally, we need not repeat the account in considering each part. The same remark holds good of serous, mucous, and fibrous membranes, and indeed of all other tissues. It is, however, convenient in some cases, especially of peculiar and complicated organs, such as the eye, to describe together the affections of the part; it is not only a great aid, but almost essential to diagnosis, and makes the entire subject more intelligible.

The arrangement which I propose to adopt is founded on these two considerations; for the most part regarding diseases as they occur in the various organic systems, but in other instances viewing together those seated in particular organs.

Although diseases are spoken of under single names, and therefore appear to the mind at first view as single objects, we find in general that each embraces a variety of circumstances; and that in order to understand them thoroughly, they must be viewed in different lights. In the first place

you survey the circumstances which denote the existence of disease, and which may be called generally its external signs. You direct attention to the circumstances under which it has arisen, and you investigate the occurrences that have taken place previously. You next proceed to notice those changes in the organ which are recognisable by examination. You ascertain the alterations in the state of the part first affected, and then observe the changes which may have been produced in other parts. These circumstances are called the symptoms of disease, that is, matters which you actually see or observe at the time of examining the individual case. The word sign of disease is more comprehensive, because it embraces all the circumstances that have taken place prior to the time of examination. The symptoms of disease are divided into primary, that is, changes in the state of the part itself; and secondary, or such as may be noticed in the condition of other organs. Redness, swelling, and yellow discharge, are primary symptoms of gonorrhœa. Increased frequency of making water, swelling of the absorbent glands, the testicles, are secondary symptoms of the same disorder. In looking at the symptoms of disease, practical persons particularly turn their attention to such as constantly take place in each particular disease, which have been called *Pathognomonic*. They are inseparable from the disease; their presence therefore indicates that the disease exists, while their absence shews that the disease is not present. Secondary symptoms, for example, cannot be pathognomonic. Even symptoms that belong to the organs immediately affected, are not always the same in every case; thus few come under the description of pathognomonic. These are mostly found in external disease, and are referable to what we ascertain by surgical examination. Thus, for example, if a patient have pain in making water, and the water is interrupted

in its passage from the bladder, or if he feel pain on the motion of a carriage or other bodily exertion, we suspect that he has stone in the bladder. But all these symptoms may coexist with other diseases besides stone. If, however, we introduce a metallic instrument into the bladder, which strikes against a hard body, it is a pathognomonic symptom of stone.

Symptoms may be divided into *local* and *general:* the former are those seen in injured or diseased parts; the latter are the disturbances excited by the local mischief in other more or less numerous parts of the system. The symptoms constituting fever may occur with local inflammations, and with injuries; they may take place in connection with numerous conditions, and therefore do not point out particularly the nature of any disease.

Some causes of disease act immediately on the organs, and are called direct, immediate, or *exciting*. Thus, the application of hot water to the skin produces inflammation. Other causes produce a state of body in which disease is likely to occur without actually giving rise to it; these are called *remote* or *predisposing*. Thus, a full state of habit, produced by indulgence in eating and drinking, is a predisposing cause of apoplexy.

You will read of what is called the proximate cause of disease; this means that which has immediately preceded its appearance. When our knowledge of a disease is rendered complete by tracing it to a particular part, the condition of such part, indicated by an appropriate name, is the disease, and the influences which have induced that state are the proximate cause of the affection. When, from obscurity in the actual seat of mischief, the name of the disease merely denotes a group of symptoms, the affection of the suffering organ, if discovered, is the proximate cause of the symptoms

so named; in other words, the proximate cause is the disease itself.

The subject of causes will be best understood by stating a case. An individual of stout frame and sanguineous temperament, with short neck, is of full habit, produced by indulgence in eating and drinking. He makes a hearty dinner or supper, filling his stomach with food; and shortly after falls back in his chair, loses consciousness, and has an attack of apoplexy. He either dies almost immediately, or without regaining his senses or voluntary motion. On examining the body in two or three days, effusion of blood into the substance of some part of the brain is found. In this case, if you regard the loss of sensation and voluntary motion as the disease, the pressure on the brain by the effusion of blood is the proximate cause. If, however, as would be more correct, you consider the loss of sensibility and mobility as symptoms, the cerebral hæmorrhage would be the proximate cause, and must itself have depended on an unhealthy condition of blood-vessels, induced by excess or indulgence, and giving way under the excitement of the circulation by a full meal. The latter would be called the occasional or exciting cause of the cerebral hæmorrhage, of which the apoplexy or palsy would be the symptoms. The sanguineous temperament, short neck, and fulness of habit, are the predisposing or remote causes. Thus, in investigating the mode in which disease is produced, we see a series of changes, each of which, in reference to that which preceded, and to that which follows, is successively effect and cause.

Having, then, observed the nature of the case, having noted the existing symptoms, and traced the previous history, having watched the course and progress of the disease, and its termination, we complete our investigation by opening the body, in case death should have occurred. We thus find

out the changes which have been produced in the part immediately affected, or in others connected with it; we ascertain what may be called their *pathological* condition. These inquiries have materially contributed to give us correct notions respecting the nature of diseases, and have dispelled the fanciful views in which disease was attributed to supposed alterations of fluids, or to the condition of the vital properties; for it has shown in most cases that material changes have been produced in the organs of the body. These examinations complete the history of disease. In some cases we find no visible change, but this negative circumstance is of use in detecting error.

Valuable as is the knowledge imparted by these examinations, you must not consider them of the first importance; clinical observation affords the best means of ascertaining and appreciating the changes caused by disease. Examination after death, in fatal cases, completes the history and our knowledge of the matter, and is thus a useful auxiliary source of information.

In order to discover the exact seat and nature of disease, close attention is often required in discriminating between the affections of contiguous organs, in determining which among the several affections incidental to a part is that present in the case, and in distinguishing between primary and secondary diseases. This branch of the inquiry is called the *diagnosis*, and the circumstances which lead us to establish the distinction may be called the diagnostic signs.

When we have thoroughly investigated a disease, tracing its history, ascertaining the symptoms, observing its progress and changes, together with the effect of treatment, we shall be able to form a rational opinion respecting its duration and effects; we shall be prepared to foretell or prognosticate the event and termination, whether favorable or otherwise, in

other words, to form the *prognosis*. This is a matter of considerable importance in practice, respecting which the patient and friends are naturally anxious, wishing to know whether there is any or what danger, and how long it may be before ordinary occupations can be resumed.

In dangerous cases we must steer cautiously between two opposite difficulties, not giving unnecessary alarm, nor indulging hopes which may be disappointed. We must listen to inquiries which we cannot always answer satisfactorily, and avoid any evidence of impatience, even if the questions should be somewhat troublesome. Policy, as well as better feelings, recommends sympathy of tone and answer. Few persons can estimate professional skill, but all can feel the value of attention and kindness. Be cautious not to pronounce sentence of death, as patients thus condemned have sometimes recovered. It has been truly observed, that nothing is more certain than death, nothing more uncertain than the time of dying.

Having observed the disease in the way I have mentioned, you naturally pass to the consideration of the means by which it may be arrested or conducted, through a certain course, to a successful termination. These means fall under three divisions, namely, the management of external influences which tend to the restoration of health, such as diet, air, exercise, clothing, sleeping, waking, &c., which are called by the name *dietetic*; the second, *pharmaceutical*, the employment of internal and external remedies; the third, *chirurgical*, including operations and other manual proceedings. This division, which is at least as old as the time of Celsus, shows that surgery, properly speaking, is a branch of therapeutics, or treatment.

The several circumstances connected with disease, as just mentioned, taken altogether, constitute the science of

pathology; and the investigation of disease is not complete till it has been surveyed under all these aspects. Disease may be considered in one or other of these views only, and treatises have been written upon parts of the subject, under especial names. The consideration of nomenclature constitutes *nosology;* that of symptoms, *symptomatology;* of causes, *ætiology,* &c.; and there have been treatises on the art of *diagnosis.* There is no doubt that useful information may be given in this way; but the several divisions of the science of medicine elucidate each other so materially, that the subject will be most advantageously treated as a whole.

CHAPTER II.

INFLAMMATION: ITS NATURE AND SYMPTOMS.

The causes of disease, however various they may be, in the great majority of instances disturb the circulation of the parts in which they occur. They are said to stimulate, to excite, to irritate, to inflame. All injuries and all external irritations produce inflammation, and a great variety of internal causes, of which, in many cases we cannot ascertain the nature, or form a satisfactory appreciation, produce the same result. Inflammations, again, occur in certain cases, if we may use such an expression, sympathetically: they seem to be effects or symptoms of a general disorder existing in the frame. Of all the various diseases which constitute the catalogues of our nosologies, the greater part consist either of inflammation in particular organs, or of changes which are produced by it; and there are few indeed in which inflammation in some part is not either a cause or consequence, a concomitant circumstance, or a mode of cure. When I say mode of cure, I allude to the production of inflammation artificially as the means of remedying disease. This is a circumstance peculiar to inflammation, and not belonging to other morbid affections. By external applications we can excite inflammations similar to those which arise from internal causes. We cannot, however, in the same way, produce organic changes, such as cancer, fungus, hæmatodes, exostosis.

Of what are called general affections, there are very few in which there is not inflammation of some particular organ, and in which that inflammation is not either the cause of the affection, or a concomitant circumstance. We shall hardly meet with any cases of fever in which this is not exemplified. Therefore, a course of lectures, whether medical or surgical, must be principally occupied in describing inflammations, in pointing out the effects which they produce in the several organs and textures of the body, in showing the various forms under which they appear, in investigating their causes, explaining their varieties, and exhibiting the means by which they may be controlled, arrested, or removed. I therefore begin with this important subject, in order to avoid the necessity of repetitions in speaking of particular diseases.

Inflammation has generally been spoken of and described in the abstract; but the varieties of the process dependent on differences in the structure of the affected organs, on the nature and cause of the disease, are so numerous that they cannot be comprehended in a general description. In order, therefore, to give you a general notion of the subject, I shall select a particular instance, in which the character of the disturbance and its injurious effects are strongly marked, inflammation of the hand, produced by a wound, puncture, laceration, or other injury of a finger or the hand. The injury, being trivial, is disregarded, and ordinary occupations requiring exertion of the part are continued in spite of pain. This, however increases, with swelling involving the whole hand, with intense suffering and fever, until medical assistance is at last resorted to. The whole hand is now the seat of a violent inflammation in full development. It is swelled, red, hot, painful, and cannot be used; the swelling affects the entire hand. In the immediate situation of the injured

part, and in the palm, it is tense and firm, softer at the back of the hand. The redness is a bright scarlet, or light crimson tint. It is that kind of colour which we suppose to be produced by an increased quantity of arterial blood in the part. The redness is most intense in the immediate neighbourhood of the injury, and from that it is gradually shaded off towards the sound parts. The increased heat is sensible to the touch. The patient, too, complains of burning heat in the seat of disease. If, however, we examine the temperature by the thermometer, we do not find such an increase as the sensation described by the patient would lead us to expect. The heat does not rise beyond the natural temperature of the blood, namely, about 98° Fahrenheit. This point has been particularly investigated by Mr. Hunter. He excited inflammation in the cavity of the chest, in the vagina and rectum of animals; and he found that the temperature of those parts never rose, under any intensity of inflammation he could excite, beyond the natural temperature of the blood. If you place a blister on the skin of the chest, and afterwards examine the temperature of the part from which the cuticle has been removed, you will find the thermometer will probably rise about *two* degrees beyond the temperature of the surrounding skin. In the same experiment on the extremities, the difference of temperature will probably be *four* degrees, because the temperature of the extremities is naturally lower than that of the parts near to the centre of the circulation. On one occasion, in which Mr. Hunter was operating for hydrocele by incision, he introduced the bulb of a thermometer into the cavity of the tunica vaginalis, and found the temperature to be 92°; on the following day, when inflammation had commenced, it had risen to $98\frac{3}{4}$°*.

* MM. Becquerel and Breschet are supposed to have found an inflamed part considerably hotter than the internal organs of the body—that is to say,

The pain in the first instance, is slight, and it gradually increases. It is augmented on pressure, and increased by any attempts to use the part. At first the patient experiences something of a dull aching; but as the inflammation proceeds, that feeling assumes a peculiar character, and is attended with a throbbing or pulsatory sensation. The patient feels the increased pulse. This is not a mere sensation of the patient. There is actual increase of fulness and force in the pulse throughout the limb, of the pulsation in the neighbourhood of the diseased part. The pulse at the wrist on the inflamed side is fuller, stronger, and harder, than that of the opposite wrist. The throbbing extends along the radial and ulnar arteries to the elbow, and in some severe cases reaches as far as the brachial itself. In conjunction with this increased fulness of the arterial trunks which lead to the inflamed part there is a corresponding distension of the veins. On the back of the hand and along the arm they are as full as they are seen after placing a ligature above the elbow, before you perform venesection.

In conjunction with these four remarkable alterations in the part, the *function* of the inflamed organ is suspended, or,

hotter than the blood—and that Hunter's explanation of inflammatory heat is consequently valueless. Simon has lately instituted some experiments in conjunction with the aid of Dr. Edmund Montgomery, and on the evidence thus afforded, he affirms that an inflamed part is no mere passive recipient of heat, but is itself actively calorific. He found, first, that the arterial blood supplied to an inflamed limb is less warm than the focus of inflammation itself; secondly, that the venous blood returning from an inflamed limb, though found less warm than the focus of inflammation, is warmer than the arterial blood supplied to the limb; and thirdly, that the venous blood returning from an inflamed limb is warmer than the corresponding current on the opposite side of the body. Therefore, concludes Mr. Simon, the inflammatory process involves a local production of heat. ('System of Surgery,' edited by T. Holmes, Esq., vol. i, p. 43, ed. 1.)

at least, considerably impaired; that is, the patient either cannot move the limb without pain, and then but very imperfectly; or, when the inflammation has proceeded to its highest extent, he is totally incapable of moving it. If the inflammation continues, the symptoms increase in intensity, with total loss of rest. The local disturbance may proceed so far that the part can no longer sustain it, and partial mortification ensues. A portion of the skin assumes a dirty brownish or blackish colour, indicating that it is dead; and the part thus deprived of its vitality, is technically called a *slough*. Under a less violent degree of inflammation, matter forms; that is, a thickish yellow or whitish fluid, known by the name of *pus*, is poured out by the inflamed vessels into the substance of the part, being deposited in one spot, which is called an abscess: this is technically known by the term *suppuration*. Or, without proceeding to either of these states, the swelling of the part may diminish, the pain and redness slowly lessen, the symptoms and effects of inflammation gradually disappear: the natural state returns by degrees, and the power of executing the natural function is restored, in other words, the symptoms of inflammation slowly subside, and the part recovers; this is called *resolution*. Under certain circumstances, that is, in some kinds of inflammation, not in such a case as I have been considering, the symptoms will disappear *suddenly*, and almost immediately. The French have designated this sudden disappearance by the term *delitescence*, a word derived from the Latin *delitesco*, which means, to be concealed or hidden. In the one case there has been swelling in the part, and slow removal of that swelling, occupying a considerable time; in the other, the removal is rapid; so that, there is a propriety in distinguishing these two modes of termination. Where mortification or suppuration may have taken place, there is more or less indura-

tion and swelling in the surrounding parts, or these changes caused by interstitial deposition may occur alone, without the more serious alterations, not only augmenting bulk but considerably impairing motion.

Inflammation is said to terminate in mortification, suppuration, interstitial deposition, or resolution. The latter is a real termination; the normal state of structure and function is restored. The inflammation may go on unabated after the other changes.

Such, then, are the effects which inflammation produces in the part which is its immediate seat, and these are the *primary* or *local* symptoms of the disturbance.

At the same time, in a violent inflammation, important on account of the organ affected, or from its extent, other effects are produced, called *secondary, sympathetic,* or *constitutional.* They exemplify the intimate connexion which binds together the various organs, and involve so many parts that, speaking loosely, the constitution may be said to suffer generally. The vascular system is disturbed, the action of the heart being affected, the pulse full, strong, and hard. The nervous system suffers; there is pain of the head, back, and limbs; also restlessness, want of sleep, and sometimes even delirium at night. The digestive organs are obviously involved. The tongue is white; there is want of appetite, thirst, costiveness, and sometimes even nausea and sickness. The secretions are suspended, or, at least, diminished in quantity. The skin is hot and dry, the mouth is dry, the urine scanty.

These constitutional or sympathetic disturbances having been produced by the local affection, gradually go off in proportion as the original disorder abates. They are relieved more particularly when suppuration occurs, for then the secretions are restored. The circulation, relieved by this

natural outlet, becomes tranquillised, the nervous system recovers, and the appetite returns.

Such are the several phenomena, local and general, of a well-marked attack of inflammation, and you see there is a correspondence of character between the two.

To an inquiry in what inflammation consists, it would not be sufficient to enumerate the local symptoms, the swelling, redness, heat, pain and impaired function. These are symptoms of inflammation, external signs by which we know that inflammation exists, but the real question is what are the changes in the part of which these symptoms are the external evidences? There is disturbance of the circulation, as consequences of which, when it has proceeded to a certain extent, nutrition and secretion are altered, impaired, or suspended. Can we as yet explain how these effects are produced?

It is clear, from circumstances, that an increased quantity of blood enters and circulates through the inflamed part. The increased fulness and throbbing of the arteries, the visible distension of the venous trunks, the enlargement of the small vessels, as shown by the redness of the part, and the general redness throughout the tissues on examination after death satisfactorily prove that there is an increased quantity of blood sent to the part. All the textures of the inflamed member seem to contain a greater quantity of blood-vessels, and these appear to be of greater size than natural. That they are actually enlarged was shown by Mr. Hunter, in his experiment on the ear of a rabbit. He produced inflammation in one ear; after it was fully developed, he killed the animal, injecting the head, and clearly found that the vessels of the inflamed ear were much larger and more numerous than those of the sound one. He has given, in his work on 'Inflammation and the Blood,' an engraving of the two ears,

between which the contrast in the number and size of the vessels is most striking.

Though these circumstances prove that an increased quantity of blood is sent to the inflamed part, it does not follow that a greater quantity is circulating through it. That a greater quantity enters is beyond doubt, and it has been supposed that the additional supply is stagnant, or confined, in the part. But other circumstances prove distinctly that a greater quantity actually circulates through it. If you cut into an inflamed part, blood flows much more abundantly than it would from a similar incision in a sound part. Take the case of phlegmonous erysipelas, which occupies the skin and cellular membrane. If you make an incision, not going deeper than the fascia, a great number of vessels bleed most freely, so that twenty or thirty ounces of blood may escape very rapidly. If you perform an operation on an inflamed part, or in its immediate neighbourhood, which you should avoid if possible, the vessels, both arterial and venous, bleed most profusely. The distended state of the veins sufficiently proves that there is more rapid circulation. The comparative state of the circulation in an inflamed and uninflamed part is shown in the case of a young man admitted into the hospital with violent inflammation of the hand, already extending to the forearm at the end of a week, from an accident to the little finger. The radial pulse of the inflamed limb was full, strong, and frequent. I ordered that a vein should be opened in each arm at the same time. About fifteen ounces of blood flowed from the inflamed limb, while three ounces were escaping from the opposite side. The latter had a thin, buffy covering, while the former presented a thick layer of the toughest fibrine, and was cupped to the utmost extent.

This general view, then, leads us to see that the phenomena

of inflammation are attended by increased activity of the circulating system in the affected part. The redness and preternatural heat are obviously accounted for by this view. The redness by the increased quantity of blood, and the increased heat on the same principle. The heat of the body certainly depends principally on the changes produced in the blood in passing through the lungs; and when a larger quantity of that fluid is sent into, and circulates through, any part, it will obviously follow, that the temperature of that part must be increased, but still it never rises above the natural heat of the blood. The swelling is to be accounted for partly by the turgescence occasioned by the general distension of the blood-vessels, and partly by the interstitial deposition. The pain will be readily explained by the circumstance of the nerves participating, as well as all other parts, in the general disturbance. It has been a disputed point whether the pressure of the turgid vessels upon the nerves caused the pain, or the irritation of the nerves gave rise to the vascular turgidity; it is a question of little moment, and which scarcely admits of a positive answer. The constitutional symptoms are to be regarded as sympathetic effects produced by the state of the inflamed part; and here we see that the local disturbance acts equally on the vascular, nervous, digestive, and secreting systems; they are all equally affected. Of these sympathetic affections another view may be taken; we may suppose, and some of the phenomena would seem to convey that view, that the disturbance of the circulation of the part is communicated to the rest of the vascular system, and thus accounts for the affections of the digestive and nervous systems and of the secretions.

Examination of inflamed parts after death shows clearly how the various tissues have suffered. There is increased redness of all the textures, the vessels being larger and ap-

parently more numerous. There is an effusion of firm character in and about the immediate seat of inflammation, of a soft substance in the neighbouring parts. These effusions, which fill the interstices and clog the various tissues uniting them together more closely, are the albuminous and fibrinous parts of the blood. The inflamed tissues are firmer to the feel, but the cohesion of their particles is diminished; they have lost their elasticity, and are rendered brittle, so that ligatures cut through them instead of holding.

We proceed thus far in our attempts to explain inflammation on safe grounds, that is, on clearly ascertained facts. Not contented with the knowledge thus obtained by direct observation, pathologists have indulged in hypotheses and constructed theories of inflammation. Besides a host of others, two justly celebrated men, Boerhaave and Cullen, have attempted the subject, and seem to have believed that they had solved the difficulty. The opinion of the first was conveyed in the expression *error loci;* it was that the circulation became obstructed by the minute vessels being stopped up by the particles of the blood. Cullen thought that the minute vessels were in a state of spasm.

These notions of obstruction and spasm are altogether imaginary, grounded on the diminution or suppression of secretion. This only proves, however, that a new and unusual exertion supersedes the ordinary mode of action. Albumen and fibrine are poured out abundantly from the surface of inflamed serous membranes and interstitially in other textures. Inflamed mucous membranes exhale fluid most copiously.

The aid of the microscope has been invoked, in the hope of settling the matter by direct observations of the circulation in an inflamed part, the web of a frog's foot being placed in the field of the instrument, and excited by some irritating

application. Even here directly opposite conclusions have been drawn by different inquirers, the difference being between transmission of blood in increased quantity and stagnation, between increased activity of vessels and atony. The more accurate inquiries of modern observers show that there is a gradually increasing obstruction of the circulation, where the disturbance is carried to the highest pitch, while the enlarged vessels in the circumference transmit the blood more actively. The following statements, which I do not pretend to indorse, present the general opinion of the day.

After the application of a local irritant, the vessels first contract, but shortly afterwards dilate, and become tortuous and varicose; the current of blood above the spot irritated becomes sluggish, and if the injury be severe, ceases entirely. Within this area the fluid part of the blood is lost, the corpuscles clinging to the walls of the vessels and adhering one to another. These changes in the blood-vessels are not primary but secondary phenomena, and microscopists next assert that the dilatation of the arteries is not an active, but a passive, process. The augmented supply of blood, it is argued, is not the result of an increased activity of the vessels; on the contrary, it is due to their dilatation, which is a consequence of diminished vitality of the tissues. The conclusion accordingly is, that the cause of "inflammatory stasis" lies wholly in an influence exerted on the blood by the textures; in other words, that it is "primarily the result of an increased attraction which the inflaming tissue exerts, as it were, suctionally, on the blood coursing within its capillaries."

It would be a complete waste of time to examine further the various hypotheses respecting inflammation. It may be sufficient to say that it is disturbance of the circulating system, with an altered mode of exertion; but what the

alterations are we do not know. It is not simply increased vascular activity; that would produce increased nutrition, augmentation of natural bulk or secretions, as in the annual reproduction of the stag's horn, in the swelling of the gravid uterus and of the breasts of suckling women. Thus the seat of inflammation is in the capillaries, those vessels which are the agents of nutrition, growth, secretion, and excretion, which perform all the active business of the animal economy. We do not yet know what differences of structure and action produce all the varied results of vascular exertion; how the capillaries of one part form bone, those of another muscle; why some secrete bile, others mucus or urine. Can we, then, be surprised that we do not understand inflammation?

Being unable to assign the exact nature of the change in the part, we are obliged to name and define inflammation from its effects or symptoms. The terms *inflammation, phlegmasia, phlogosis, phlegmon,* are all derived from the most striking external character, that of increased heat. If we do not yet understand the nature of this frequent, almost universal, and therefore familiar affection, can we be surprised that all attempts at founding nosological distributions on the nature of the several affections have failed?

CHAPTER III.

ON INFLAMMATION: ITS EFFECTS, VARIETIES, AND CAUSES.

I HAVE already alluded to the fact that we find the textures of an inflamed part, examined after death, preternaturally red, and the number of the blood-vessels apparently increased, while they are turgid with blood; at the same time interstitial deposition is observed in the structures generally.

When we examine the parts, they feel firmer than natural; notwithstanding which they are more easily lacerated and give way under the application of force, so that the effect of the inflammatory process is to diminish the natural cohesion or firmness of parts, and this is found to be the general result of the disease in its active form. This particular result is often seen in the brain where a peculiar softening takes place,* which was originally observed without reference to the cause which produced it. Accurate examination has proved it to be merely a change dependent on inflammation.

The newly deposited substance is that formerly and still sometimes called coagulating or coagulable lymph. It is

* Softening of the brain often proceeds from inflammatory reaction consequent upon disturbance of the cerebral circulation, as after ligature of the carotid artery; another cause consists in the plugging of small arteries by masses of fibrine, dislodged from the valves on the left side of the heart, or from some part of the arterial system, as was first described by Virchow,[1] and subsequently by Dr. Kirkes.[2]

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[1] Virchow's 'Archiv.'

[2] 'Med-Chir. Trans.,' vol. xxxv.

the fibrine of the blood, namely, that whitish and tough part which is seen after washing the red particles from the crassamentum or clot. It is analogous to the buffy coat seen on the surface of blood drawn from a patient labouring under inflammation, and is now generally termed fibrine.

But inflammatory effusions present differences in their character. Thus, contrast the membrane formed about the larynx in croup with the muco-purulent secretion of bronchitis, or the tough, blood-stained mucus poured forth in pneumonia. Compare the hard, syphilitic node on the tibia with the soft, fluctuating swelling proceeding from the same cause on the forehead. The circumference of an inflammatory swelling presents a soft or œdematous condition which is due to effusion of serous fluid.

We see the nature of inflammatory effusions when the serous membranes are inflamed, because there the substance, which in other parts is deposited interstitially, is effused on a surface. When the peritoneum or pleura is inflamed, a soft and semi-transparent substance, like thin glue, is deposited, so that the opposed surfaces, which are naturally free, become agglutinated.

On the serous surface of the lung you may see this fibrine poured out in such a quantity as to cover the organ completely. At first it lies loosely connected, so that you can easily scrape it off with the handle of a knife; but soon blood-vessels shoot into it and organize it, when it assumes the character of the structure from which it has been produced, that of the pleura. The way in which the vessels extend into the newly deposited substance has been made the subject of microscopical research.

You see the same phenomenon in inflammation of the iris. The lymph is deposited either generally in its texture, altering the colour and changing considerably the nature and appear-

ance of its structure, or as a distinct mass or patch. The matter thus poured out constitutes the source of adhesions between the margin of the pupil and the capsule of the lens.

When lymph is deposited interstitially in the various textures the phenomena are more obscure, as the effused matter is blended with the natural structure. All the tissues are thickened, condensed, and closely adherent, so that great stiffness or entire loss of motion may result. Such an occurrence in the right hand of a labourer or mechanic may render him entirely unfit for his occupation.

Inflammation may leave behind in the affected parts, the testicle for example, a degree of hardness fully equal to that of scirrhus, and this change, with its possible degeneration into cancer, has not unfrequently been stated in works of apparently good authority among the effects of inflammation. The hardness, however, in this case is simple induration, without anything of malignant character. In scirrhus, without any previous inflammation, a malignant growth is found in lieu of the natural structure, while more or less obvious traces of the latter are seen in simple induration caused by inflammation, which has never, in my experience, assumed a malignant character.

You are not to understand that each inflammation produces one only of these effects; on the contrary, depending, as they do, on differences in the degree or intensity of the disturbance, they are usually combined, affecting different portions of the same part. Thus, there may be mortification in the centre, with suppuration under and around, then a larger circle of consolidation by fibrinous effusion, and still further off serous infiltration. While these changes are taking place where the disturbance is most active, the inflammation may slowly subside in the circumference and terminate by resolution. There may still remain swelling and

thickening from effusion into the inflamed textures. After suppuration has taken place in one part fresh excitement may occur in the neighbourhood. Thus, inflammation originating in the finger gradually extends into the palm of the hand and thence along the forearm, producing in these various parts changes of structure by which the motions of the limbs are impaired or entirely lost. Hence the great importance of preventing such a calamity by employing the most effectual measures at as early a stage as possible.

The idea of inflammation drawn from the examination of external parts has been generalised, and hence it has been said to consist in the five circumstances I have detailed, namely, redness, swelling, heat, pain and impaired function; we do not include the sympathetic influences in our general notion of inflammation, because they do not invariably attend. The disturbance of the sanguiferous and digestive systems, of the secretions and excretions, which constitute inflammatory fever, are only observed when inflammation is violent, extensive, or seated in an important organ. In less serious cases these influences, though not strongly marked, are seldom wanting, while they may be very severe occasionally, where the disease is neither extensive nor seated in a part of importance, as in inflammation about the finger-nail, in thecal abscess, in suppuration under the periosteum, particularly on the cranium.

Not knowing the exact nature of the local changes, we are not surprised when we find that almost directly opposite opinions have been entertained respecting the state of the circulation in the inflamed spot. One thing is clear, namely, that if a vein be opened between the seat of disease and the heart, a much greater quantity of blood will flow in the same time than if no inflammation existed.*

* All microscopical examinations prove that in one spot, where the inflam-

Acute inflammation is called also active, violent, or phlegmonous. The term "phlegmonous" was applied by the Greeks to that active form of inflammation seated in the areolar tissue which leads to abscess. Chronic inflammation is called also languid, slow, or indolent; the vascular disturbance and redness are much less; the pain is slight; the inflammation frequently proceeds to a considerable extent before the patient is aware of its existence. But though the chronic may appear to be of much less consequence than the acute disturbance, it often produces more serious change of structure in the affected organs.

But the varieties of inflammation are more numerous and important than would be represented by this simple division. Let us take, for example, the finger; there may be the common inflammatory excitement following a scratch or cut, erysipelas in its various forms, burn, chilblain, whitlow, gout, rheumatism; and differences, both as to degree and results, are noticed yet more abundantly in the affections to which the internal organs are subject.

I. Let us notice varieties in the absolute and relative degree of the changes usually regarded as essential characters.

The redness varies in its tint; it may be bright scarlet or crimson, or, on the other hand, livid; the colour may in both instances be slight or intense. Those differences are in great measure dependent on the quantity of the capillary vessels.

matory action is highest and the effusion most abundant, there is likewise a stasis or stoppage of the blood; that here the blood has lost the fluid in which its corpuscles should float; you read of "blood-corpuscles clinging to the walls of their containing vessels and aggregating there." This stasis occurs with more or less facility in proportion as the liquor sanguinis is more or less transudable; but it does not result from alteration of calibre in the afferent or efferent vessels of the part. The cause of its production lies wholly in the influence exerted on the blood by the textures themselves.

The swelling may be considerable or slight, according to the degree of inflammation present and the differences of texture; as, for instance, in inflammation of a mucous, serous, or fibrous membrane, the bronchial membrane, the pleura, or the sclerotic coat of the eye.

Heat varies similarly in degree; the hot, burning sensation in an acute abscess may be contrasted with the absence of any increase of temperature in a chronic purulent formation.

Pain may be violent or entirely absent. Generally, the more intense the inflammation the more violent the pain. But the difference in the degree of pain partly depends on difference of texture. In proportion as the part is more firm and dense and more copiously supplied with nerves, the pain is greater, and *vice versâ*. Thus, in paronychia the pain is extreme; in inflammation of the conjunctiva it may be entirely absent; in that of the sclerotica it is dull, heavy, and aching.

II. *Various effects.*—I have mentioned the usual effects commonly called *terminations* of active inflammation when seated in a part like the hand; but if we enumerate all the degrees of the inflammatory process, and all the effects it may produce in the various organs and textures, the catalogue will be much increased.

1. *Increase in number and size of blood vessels* is a very general, if not universal, effect of inflammation. As inflammation is essentially seated in the vascular system, we naturally inquire what is the first step in the deviation from health. We cannot but suppose that some change occurs in the part prior to increased vascular action; that some impression is made on it, in consequence of which fluids are attracted in unusual quantity, and the vessels excited to unusual exertion. This unknown impression or change is the *irritation* of some pathologists.

The terms *irritation* and *disorder*, which we use to denote slight deviations from the normal functions of a part, may be considered to comprehend especially in the case of organs not open to immediate observation during life the early stage and the slighter degree of inflammation.

When such trivial disorder occurs in an organ which we can examine, such as the eye, we find its circulation disturbed; the same change probably occurs in internal parts, which we cannot see. The inflammatory disturbance not unfrequently consists wholly or at least principally in the increased size and number of blood-vessels. It is then called *determination of blood,* vascular congestion, local plethora, hyperæmia. In many cases this change does not remain after death, but often there is turgidity of blood-vessels, with apparent increase of number as if they had been injected.

Hæmorrhage. A rupture of vessels is a likely occurrence when they are distended and under increased exertion. Blood may be effused into the substance of a part, such as the brain or lung, or on the surface, as in the alimentary canal or the air-passages, not always proceeding from *rupture* of vessels, for in the latter cases we may fail to trace breach of surface. Not unfrequently there is some mixture of blood with matter and with the effusions into serous cavities, probably from the same sources as the matter or effusions.

Changes of secretion are illustrated by the effusion of serum, lymph, and pus. These three products are dependent on differences in degree of the inflammatory action, as we see in an abscess, where pus is formed in the centre, lymph effused around, to form the parietes, and serum in the circumference. But yet not wholly so, for *texture* as well as *degree* exerts an influence; thus, serous membranes easily pour forth lymph, and mucous membranes, pus.

Diminished cohesion is seen in the brittleness or softened

condition of inflamed parts. The lung-substance consolidated by the inflammatory process breaks down easily under pressure; the substance of the brain may be semi-fluid from the same cause. The inflamed mucous membrane of the alimentary canal may be reduced to a pulp. In inflamed parts ligatures cut through or tear away the textures.

Ulceration and gangrene will be mentioned in another lecture.

The more remote changes consequent on inflammatory effusions consist in opacity of parts naturally transparent, as the cornea or the arachnoid membrane; in adhesion between those naturally distinct, as in the serous cavities; in thickening, consolidation, and induration, white, gray, or red, the last termed hepatization; the differences depending on the number of the capillary vessels.

All these differences in effect depend in great measure on difference in the degree of inflammatory disturbance, in which respect they might be arranged in the following order: *Irritation, Vascular congestion, Effusion of serum, Ulceration, Hæmorrhage, Effusion of fibrine, Suppuration, Gangrene.*

All inflammatory effusions are of high specific gravity, and contain a large quantity of albumen; they may also contain fibrine, pus, or blood-cells. The great chemical characteristic of inflammatory effusions, according to Mr. Simon, is their excess of chloride of sodium and of phosphates. Pus, says Professor Lehmann, contains three times as much chloride of sodium as the serum of the blood, and during pneumonia, it has been shown by Dr. Beale, the lung is so disproportionately loaded with this salt that the urine is entirely deprived of it. But in all inflammatory effusions microscopic cell-forms abound. Whether they first appear as transparent nuclei, which subsequently gather around them their investing wall, or whether they represent pre-existing cells,

which pervade the entire organism and become apparent only during inflammatory action, are points which I shall leave, without further comment, for the consideration of those interested in such matters.

The differences here mentioned are more noticed in cases of *spontaneous* than in those of *accidental* inflammation. All the textures involved in a wound suppurate, although muscular and fibrous tissues are hardly known to suppurate otherwise.

III. *Degree.*—The inflammatory disturbance varies in its amount or quantity; there may be *more* or *less* of it; when *more,* the process is rapid; when less, *slower.* These differences, as I have already stated, are marked by the epithets *acute* and *chronic,* those terms denoting differences in *degree,* not in *kind.* Violence of symptoms and rapidity of course are seen, in acute; mildness and slowness in chronic. The terms are not opposed to each other in sense. *Acute,* which means sharp, refers to the symptoms, especially the pain. *Chronic,* i. e. *enduring,* to the time occupied.

You are not to suppose that there are just two degrees of violence, so that each case can be referred without hesitation to one or the other; on the contrary, between the most violent, rapid, or acute, and the mildest and slowest, there is a great and indefinite number of gradations, like the intermediate shades between two colours. Some adopt three degrees, *acute, subacute, chronic.* Acute is synonymous with active, violent, phlegmonous; such a disturbance is too violent to last. It must be cut short by treatment, or it will destroy or disorganize the part.

Chronic is also called languid, slow, indolent. The vascular disturbance is less; the redness inconsiderable or wanting; pain trifling or none; sympathetic influences hardly noticed, consequently there is no constitutional disturbance; but the

altered secretion is a striking feature; and interstitial deposition, with swelling and change of structure is greater.

If we contrast the changes in the testicle affected with acute inflammation as in some cases of hernia humoralis, with those of more chronic nature, producing that morbid enlargement called by the older surgeons sarcocele, or with the venereal disease of the same gland, we shall find that in the latter there is permanently organized new matter, as may be proved by injection. So, likewise, in the adventitious membranes lining the dura mater. They are true inflammatory effusions, as I have seen in many of the examinations which I have performed at Bethlehem Hospital.

Thus, in *acute inflammation* there is violent but temporary disturbance; the part soon regains its natural state. In *chronic,* with apparently slighter disorder, we find greater and more permanent change of structure, often impairing or destroying function.

The danger in the two cases, as regards the part, and the difficulty in treatment, are in an inverse ratio to the severity of the symptoms and apparent ground of alarm. The violent disturbance of acute inflammation is easily stopped; to remove or check the disorganizing effects of chronic is a work of greater difficulty and longer time.

Acute and chronic stage. We use the terms *acute* and *chronic stage* not only to mark differences which are observed originally and through the whole course of the inflammation, but also to denote a corresponding difference in degree of violence in different periods of one and the same inflammation.

An inflammation is not an uniform disturbance throughout; the part goes through different states between the beginning and the termination of the affection. The symptoms, commencing in slighter form, proceed gradually to their full intensity, then there is a stationary period in which all the

phenomena are fully developed: this is followed by decline and disappearance. Though bearing one name throughout, the disturbance is different at these several times. If an inflammation be divided into three stages, the first two, viz., the origin or formation, and the stationary period, do not differ much in duration; but the third, that of decline, may be very various in length. If the inflammation have been violent, and allowed to proceed uncontrolled, if the exciting causes are still acting, and the patient is guilty of excess and imprudence, the disorder may be protracted almost indefinitely; at all events, a long period intervenes between the cessation of violent disturbance and recovery. This is called the *chronic stage* of an inflammation.

Some entertain the notion that these are essentially different, that increased action is the essence of one, debility of the other.

That there is no essential difference between the acute and chronic stages of the same inflammation, appears from the change of one into the other. Acute gradually changes into chronic, chronic often relapses into acute. The two stages often require different and almost opposite treatment. Hence, perhaps, the notion of their different nature.

The terms *active* and *passive* inflammation convey no clear meaning. Inflammation may occur in a weakened or unhealthy frame and thus important modifications of treatment, both local and general, may become necessary. We must distinguish between the nature of the local disturbance and the state of the constitution.

As the capillaries are an inextricable network, how can we determine whether vascular disturbance is confined to one or the other order of vessels, so as to justify the expressions *arterial* and *venous* congestion?

IV. *Nature* or *kind* of inflammation; it may be common

or specific. Common inflammation is that excited by an ordinary cause in a healthy constitution, *e. g.*, by wound or other injury, in a patient of sound constitution and good health. Specific derives its character from peculiarity of constitution, or of the exciting cause.

Peculiarity of constitution or unhealthiness may be either original, that is, natural or congenital, as in scrofula, or acquired, as in gout and rheumatism.

Peculiarity of cause, is exemplified in syphilis, smallpox, measles, scarlatina, itch, which are produced by one cause only.

The diseased processes are the same in specific as in common inflammation; they differ in modifications, these differences being sometimes so slight that it would be difficult to distinguish them by appearances merely.

Common inflammation proceeds regularly to some decided effect; as for instance, suppuration, mortification, resolution. In some specific diseases there is great irregularity, often sudden disappearance, with reappearance in another part, this is called *metastasis*, a Greek word, meaning simply transference.

In each specific inflammation there is a tendency to some peculiar change; to ulceration in syphilis; to ulceration and disorganization by tubercular deposition in scrofula.

Under this head of diversity in kind may be mentioned differences dependent on the nature of the cause; in which respect inflammation may be distinguished as:

Accidental, spontaneous, and *symptomatic.*

In the first, the symptoms appear quickly or immediately after the application of the cause; they exist in an equal degree; the disorder proceeds regularly to its termination; and commonly produces suppuration or gangrene, or terminates by resolution.

In the second, the appearance of the local symptoms is preceded by previous disorders, often by rigors. The progress is irregular; there are exacerbations and remissions; sometimes intermissions. The complaint is protracted, and relapses are frequent.

Delitescence and metastasis are common. Suppuration and gangrene are comparatively infrequent. Induration is common, and it occurs also in the accidental. Softening is only seen as a consequence of the former.

We have also to consider individual peculiarities, such as differences of temperament, constitutional disposition to scrofula, gout, or other diseases, the indefinite matters called idiosyncrasies, and the modifications in constitution dependent on age, sex, mode of life, diet, and lastly, the effects produced by climate, season, properties of the air. Thus, hepatitis is common in hot countries. Erysipelas will prevail in foul or imperfectly ventilated wards of an hospital, or other apartments with many occupants. Typhus fever breaks out among masses of people crowded together and badly fed. Typhoid fever with ulceration of the bowels, is ascribed to unwholesome water, bad drainage, and other imperfect domestic arrangements. That mysterious disease, the cholera, swept from east to west, brought into activity by some occult atmospheric influence, and seems in many localities to have taken the place of "the plague," a disease allied to typhus in its severest form, now happily nearly extinct.

Causes of inflammation.—In considering this part of the subject, it will be convenient to adopt the threefold division of inflammations into *accidental, symptomatic,* and *spontaneous.*

Accidental inflammations are those produced by an obvious external cause; such causes being numerous.

Injuries of all kinds, mechanical, chemical or mixed.

Wounds, including surgical operations, incisions, punctures, lacerations, bruises, pressure.

Heat, strong acids, pure alkalies, certain metallic salts.

Acrid substances of various nature and power: cantharides, mustard, pepper, various metallic salts, and oxides.

Animal poisons: cowpox, smallpox, syphilis, gonorrhœa, purulent ophthalmia, itch.

Bites of venomous serpents.

Bites and stings of insects.

Excessive exertion of an organ in the execution of its natural functions, as in the case of the eye, brain, alimentary canal.

Cold and moisture, singly or combined: particular winds and various atmospherical agencies.

Direct action of cold on a part: exposure of the eye to wind, rain, or fog.

Cold or damp air to the nose, throat, larynx, trachea.

External application of cold and moisture inducing internal inflammation, *e. g.* bronchitis, diarrhœa, dysentery.

An important difference is observed in the action of the causes now enumerated. Direct violence, chemical stimuli, and animal poisons will excite inflammation in some degree; it may be considerable or slight. The other causes, such as exertion of the organ and atmospherical agencies, are quite uncertain in their effects, they do not act at all on many individuals, while in those who feel their influence the effect varies individually. A large company is exposed to wind and rain; most of them do not suffer at all; one has catarrh, one inflammation of the chest, a third rheumatism, and a fourth affection of the bowels. One individual in a company has an attack of apoplexy or palsy. Two persons strain the ankle-joint; temporary uneasiness ensues in one, inflamed joint in the other.

Hence, in addition to the external agency, a particular state of body is necessary to produce an aptitude, or predisposition to disease, and thus it has been necessary to divide causes into *immediate, direct,* or *exciting,* and *remote* or *predisposing.*

The latter may be natural peculiarity of constitution. All human beings are not organized alike. Nature has nothing of the quaker taste. She has no delight in uniformity of colour, figure, stature. She has not cut out all mankind by one pattern; on the contrary, her law is variety, as we observe unmistakeably throughout creation. Variety in organization and vital actions not less than in form, stature, functions, dispositions, and endowments. Thus the state of health, as the general result of the exercise of all the organs, instead of being an uniform condition, is different in each individual.

Such varieties as are common to many persons are called temperaments; the sanguineous, nervous, phlegmatic, melancholic; those of individuals are idiosyncrasies.

As peculiarities are hereditary, so is the disposition to particular diseases in families.

Morbid dispositions or diatheses are closely allied to differences of temperament, but they make a nearer approach to disease, as in scrofula, gout, rheumatism. The two latter may be original or acquired.

Disposition to particular kinds of disease may arise from age and sex, natural vigour or weakness of frame, climate and situation.

Erysipelas in tropical countries. Hepatitis in hot regions, here it is rare, and abscess of the liver is almost unknown.

Yellow fever in certain American cities, whenever the thermometer remains at or above 80° for six weeks consecutively. Intermittents; malaria.

Symptomatic inflammations are those caused by previous disease of another part; such as inflammation of absorbents and glands from syphilis or other local disorders, affection of the testicle in gonorrhœa; or they are local inflammations produced by general affection of the constitution. Here the inflammation is a symptom of the disease; in accidental cases the inflammation is the disease. The pustules of small-pox, the efflorescence of scarlatina and measles, and secondary syphilis, are examples.

In *spontaneous inflammations* there is no obvious exciting cause; while in some the origin is quite obscure, as in influenza, and cholera.

In many inflammations, both external and internal, acute and chronic, we can trace no injurious agency on the part; but we find an unhealthy state of constitution; we refer the local disease to this cause, and we accomplish the cure by rectifying the constitutional indisposition. These states of health are brought on slowly; the individual does not consider himself ill; he is suddenly attacked with disease, but does not refer it to the constitutional cause; he ascribes it to some particular occurrence, to having been chilled or heated, to going from a hot room into cold air, or *vice versâ*, to something eaten or drunk. These inflammations, owing their origin to a morbid state of constitution, are thus allied to the preceding division or the symptomatic. The local complaint is in some sort the offspring or symptom of the general affection. These unhealthy states of constitution give a predisposition to inflammation generally; they render the body susceptible of external agencies, which otherwise would not affect it, and they aggravate the inflammatory disturbance consequent on the action of direct exciting causes. Gouty inflammations might be classed under either division.

The causes, nature and progress, of these unhealthy states of constitution, and the mode of managing them, form so important a subject, that I shall defer its consideration at present, as it would interrupt the general view of inflammation, and I shall take it up separately after concluding the latter.

According to the differences in their modes of production inflammations and other diseases have been divided into *idiopathic* and *sympathetic* or *primary* and *secondary*. The distinction is useful, because it leads us to investigate causes, to inquire into the mode in which diseases arise. Hence we come to know the true nature of disease, and are enabled to lay down rational rules of treatment.

Idiopathic or *primary* diseases are those produced by some direct agency on the part affected; either by some cause capable of exciting inflammation under all circumstances, or by such influence as will excite disease in persons predisposed. Such are the *accidental inflammations*.

In other and numerous instances of local inflammation or other disease, we see, as I have already explained, no direct operation on the part affected; but we find disturbance in other quarters; we see that the local affection has shown itself subsequently to the existence of such disturbance, and thus, that in point of time it is *secondary;* we find often that the cure of such primary disturbance will remove the local affection. Hence we consider the former to be the cause, although we cannot always show how the effect is produced.

Sympathetic diseases then may be defined as those excited by injury, disease, or disorder of another part. They are *secondary,* inasmuch as they come after the original affection. Most organs afford examples of both kinds.

Thus gonorrhœal ophthalmia may be caused by direct application of infectious matter to the eye; or it may come

on from internal causes, as an example of what is called metastasis.

Inflammation of the testis may arise directly from injury, or from the stimulating injection used in the radical cure of hydrocele, or indirectly from gonorrhœa.

The skin becomes inflamed by blister, scald, or burn.

The cutaneous inflammation called urticaria is often brought on by loaded or disordered stomach.

Disorder of the head is induced by injury or intense mental exertion; it may equally occur from overloaded stomach or costive bowels.

The reciprocal influence of the head and the abdominal organs affords striking exemplifications of sympathy, and is of great practical importance.

1. The head affects the stomach and bowels in accidents and other cases. A blow on the head is often followed by sickness, vomiting, loss of appetite, costiveness. Afflicting intelligence will destroy appetite.

2. Worms in the stomach, or other irritations in the same quarter, affect the head, and cause convulsions. Stimulating liquors exhilarate and intoxicate. A large draught of spirits will kill as by apoplexy.

Abscess of the liver sometimes occurs from injury of the head.

Hypochondriasis and melancholy are often to be traced to abdominal causes.

Languor and dejection are common in jaundice.

The word sympathy does not explain these occurrences; it means, etymologically, suffering with, and thus merely denotes the simultaneous existence of two affections, without showing how the one produces the other.

Nerves are probably the agents of sympathy; when they are divided, it is no longer manifested.

CHAPTER IV.

TREATMENT OF INFLAMMATION.

In the first place, let me speak of acute or active inflammation, either with or without inflammatory fever.

You have seen, from the description which I have given that inflammation is a temporary state, although a violent disturbance, and that it may go through its various stages and come to an end without medical treatment; it may end in the restoration of the healthy or normal state, both of structure and function.

Observe in this respect the contrast between inflammation or common disease, and the organic changes produced by some specific diseases. The tendency of the latter is destructive; that of the former salutary. Cancer of the female breast commences without vascular disturbance, often without pain; in its progress it supersedes and destroys every texture it meets, until it finally produces changes fatal to life. An abscess of the breast proceeds from some local irritation, such as the accumulation of milk; it comes to the surface, bursts, and having discharged its contents, leaves the gland to resume its proper functions.

But when inflammation is violent, it disturbs to a dangerous or at least alarming degree, or even suspends the functions of the organ; it may need, therefore, to be stopped quickly in

order to save life. This is especially the case when it occurs in such parts as the brain, the lungs, or the heart, the larynx, stomach, intestines, or abdomen.

Again, the various effects of inflammation, particularly mortification, suppuration, and interstitial depositions, cause changes of structure, which impair or destroy function, although inflammation should be stopped. Even the least considerable of these effects, effusion of lymph, may produce organic alterations seriously and permanently injurious; and these take place occasionally when the inflammation is far from its highest degree. Such effusion may consolidate and harden parts which are naturally loose and soft in structure; it may cause adhesion between those which are distinct, although contiguous, and it may render transparent structures opaque.

The restorative powers of joints are comparatively weak; it is long before a knee or elbow once inflamed regains the perfect smoothness and polish of the internal surfaces, and the flexibility of the surrounding structures, which are necessary to the perfect freedom and strength of the articulation.

Inflammation of the cornea, the iris, or the retina, though not very violent, would come to a natural end; but it might lessen or destroy the transparency of the first, it might contract or close the pupil, it might impair or extinguish the sensibility of the nervous structure to light, entailing, according to its degree, imperfection or loss of sight.

If inflammation of the hand be allowed to pursue its course, or be treated inefficiently in its earlier stage, it may cause mischiefs of the most serious and distressing kinds, gluing tendons to the fibrous sheaths or bones in or on which they should play, and converting them, with fascia, muscles, cellular texture, and skin into a hard mass, with irremediable stiffness, if not immobility of the affected portions.

Hence it is necessary to arrest inflammation in order to prevent such changes, although the organ may not be important to life; and we must employ active means in the former as in the latter case, if this purpose is to be satisfactorily accomplished.

Thirdly, even supposing the organ not to be important to life, and, further, that we have no reason to apprehend any of the more serious effects, it is still very desirable to arrest inflammation quickly. The longer the vessels remain distended, the more slowly do they recover their natural state; and the more easily do they again become disordered. Hence the continuance of inflammation increases the difficulty of recovery and the liability to relapse. Hence an organ, which has been once seriously diseased, is likely to suffer again. The persons who undertake life assurances are well aware of this. However well a person may be at the time when he offers himself, they either do not undertake the risk, or they impose such terms as may secure them against future loss if they find that he has had serious disease, and they inquire carefully into his sanitary history.

Fourthly, we are to consider the relief from present suffering in acute inflammation attended with sympathetic fever.

There are certain preliminary and auxiliary measures of general application which, without directly tending to check inflammation, place the patient under the most favorable circumstances for the direct means. They consist in removing all causes capable of increasing local or general excitement. The exciting cause should be got rid of when practicable; you would remove a foreign body from the eye, and guard against cold and damp, when exposure to these agencies has brought on disease. You must enforce, as far as possible, repose of the affected organ. If it be a joint, the patient must not use the limb. Inflamed eyes must be kept at rest,

and if one only suffer, the other cannot be employed safely on account of the close sympathy between the two organs. If the head is affected, mental study and other sources of cerebral excitement must be strictly avoided.

But repose cannot be completely attained, when parts of involuntary action are the seat of disease. General rest in the recumbent posture tends to tranquillise such parts, as the heart for example. The position should be such as is favorable to the return of blood. In the case of inflammation attacking the lower extremities, the patient should be confined to bed. In the case of similar vascular excitement in the head, the sitting posture may be most agreeable.

All external agency on the affected part, such as pressure, must be avoided; hence much manual examination is injurious; the apartment should be light and well ventilated.

We next come to the direct means of lessening and removing inflammation.

On the treatment of inflammation, and first in its acute or violent form, when it is generally attended with inflammatory fever.—Among the direct means of controlling acute inflammation, we may mention, in the first place, the abstraction of blood, that is, of the material by which the disturbance is kept up. In the figurative view on which the name of this affection is founded, blood may be termed the fuel by which the flame is maintained. By cutting off the supply of blood, all vital action is stopped as we see in the brain under syncope. Thus bleeding, considered abstractedly, may be regarded as the most speedy and effectual means of arresting the local mischief and lessening the general disturbance. Its practical employment must be subjected to a careful consideration of the concomitant circumstances, of the natural constitution, the amount of bodily power, and the previous health of the

patient, his age and general condition. Blood may be taken either from the vascular system generally, or from the vessels of a part; thus bleeding is either general or local. In the former case it is drawn from a single vessel of suitable size and by a single opening; that is, either by venesection or phlebotomy, or by arteriotomy; the latter proceeding, however, having become almost obsolete. In the latter it is taken from small vessels by numerous openings, the methods being cupping, leeches, scarifications, punctures. Cupping is a kind of intermediate method. A skilful cupper will sometimes procure a given quantity of blood by cupping as quickly as it could be drawn from a vein.

Small arteries are often divided in cupping on the temple, when they pour forth a powerful jet of blood against the glass. When blood is taken thus by cupping, or when leeches are applied in great numbers, the circulation would be affected nearly in the same way as by general bleeding. Thus general and local bleeding are sometimes identical in effect. Usually, blood is drawn in larger quantity and shorter time generally than locally; but when local is assimilated to general in quantity and in the time of abstraction, we cannot expect any material difference in the influence on the complaint.

The veins at the bend of the elbow are almost invariably selected for venesection in this country. Not believing that the general effect of venesection, or its influence over the inflamed part depends in any material degree on the situation from which the blood is drawn, we choose the arm as the most convenient place for the proceeding, both to the surgeon and patient.

It has been, and probably may still be, a frequent practice on the Continent of Europe to bleed in the internal saphena vein a little above the ankle. I can give no opinion on a subject of which I have no personal experience; yet, if an

opening in the circulating system below has the effect of drawing blood from the upper regions, the head or the chest may be relieved by bleeding in the saphena. I am inclined to explain on this principle the marked benefit which I frequently see produced by the application of a few leeches on the insteps, say, for instance, three on each side.

Bleeding in the jugular vein has been recommended in affections of the head, particularly in children. It is an inconvenient and unsatisfactory proceeding, to which leeching and cupping are far preferable.

The blood drawn from a vein, when active inflammation exists in any organ, exhibits the peculiar appearances already mentioned as characters of inflammation.

There is slow coagulation, and consequently more complete subsidence of the red particles leaving the fibrine on the superior surface of the clot, free from colouring matter. The stratum of fibrine thus left, which is dense and tough, is often yellow, hence called buffy or buff-coloured. In the process of shrinking, by which the serum is squeezed out of the clot, this upper stratum, consisting of fibrine only, contracts more than the rest of the clot; hence its edge is drawn inwards so as to render the coagulum concave or cupped. The buffy coat and the cupped or concave surface which it presents, are the two circumstances constituting the inflammatory character of the blood, the so-called *buffy* or *inflammatory coat or crust* (*crusta inflammatoria* or *pleuritica*).

The buffy coat seems to differ from the rest of the crassamentum only in the absence of red particles. Sometimes it is an opaque yellow stratum, almost leathery; so that it is with difficulty penetrated with a spoon, strongly contracted at the edge, and deeply concave.

This state indicates high inflammatory action; the more yellow, opaque, and tough, the higher the inflammation.

Sometimes the inflammatory coat is softer, slightly transparent, not unlike boiled bacon fat, or a greyish jelly, like that of isinglass, little or not at all cupped.

Couenne, French; *speck-haut,* German. *Sizy* covering; *sizy* blood.

Sometimes there is a large proportion of crassamentum without any colourless stratum.

The inflammatory characters are seen in blood drawn from a vein, also in that taken from an artery;* not when it comes from the capillaries, as in cupping or leeching.

We come, in the next place, to inquire what is the comparative efficacy of general and local bleeding in arresting inflammation, in order to determine the occasions best suited to each method; we must consider also what quantity of blood should be taken, when, and how often the evacuation should be repeated.

* On this point, respecting which the authorities, so far as I know, are silent, the following statement, kindly sent to me by my friend Dr. Tweedie, affords clear and satisfactory evidence:

"While I was house-surgeon at the Edinburgh Hospital, I was directed to bleed a patient under the care of Dr. Hamilton, for hæmatemesis. The general febrile symptoms were very severe. I attempted to take blood from the veins of the arm, but, from their small size, I could not obtain the quantity ordered. I opened the jugular vein, but from his struggles the orifice closed. I then opened the temporal artery, from which the blood came in a full stream. The blood soon coagulated, and to my surprise, I found a thick, firm, buffy coat on the crassamentum. I showed the blood to my friend, the late Dr. Gordon, who told me he had searched every where for such a specimen, and had written to the surgeons of the large hospitals in London, to know if they had ever observed this occurrence—their answer was in the negative. This specimen was placed in his museum.

"I have since had an opportunity of observing the same thing in a patient of mine, at the Fever Hospital, who was bled from the temporal artery, for inflammation in the brain during fever. This last specimen, I sent to Mr. Grainger, who has alluded to it in his work on 'General Anatomy.'—A. T.

You might at first suppose that local bleeding is the best means of arresting disturbance confined to a particular spot. It seems, *prima facie,* the method best calculated to deprive the affected part of the material necessary to keep up the excitement. You can, indeed, in this way take blood out of a part, but all the channels of supply remain open, consequently fresh quantities continue to come in. The question is, can you cut off the supplies?

This can only be done by general bleeding, which, if carried to a certain extent, will stop the inflammation at the time. You see a patient with pleurisy; there is severe pain in the side, a full and strong pulse, heat of skin, and extreme distress of breathing, so that even speech is most painful. If a vein is opened, the symptoms are relieved as the blood flows, and a copious bleeding takes away the pain and restores the free action of the chest. If a violent inflammation of the eye, with intense redness, pain, and intolerance of light, is treated in the same manner, the vessels are emptied, the organ becomes pale, and can be freely opened. The effect of this in both cases is most striking when the evacuation is carried to the extent of producing faintness. Thus, general bleeding is capable not only of checking inflammation, but of entirely stopping it for a time. The vessels will fill again and the symptoms recur, but in diminished degree. By thus lessening the force with which the heart is acting, and diminishing the amount of the circulating fluid, the violence of the disorder is effectually checked, and the part is brought more near to the state of health, a condition favorable to the influence of internal remedies, perhaps with the addition of local depletion.

In this way general bleeding may sometimes, not frequently, be resorted to with advantage when it is important to subdue active inflammation quickly or to check it decidedly. Such occasions are afforded by serious and

alarming inflammatory disorders of the respiratory apparatus, whether in the throat or chest, by similar attacks of the cranial contents or those of the abdomen.

The same course of proceeding, or the use of such local depletion as may be equivalent to general bleeding, may be necessary to prevent injurious changes of structure in parts delicately organized, as the brain, eye, or ear, or where the function is important and requires a perfect state of the structure, as in a large joint or the hand. In the latter case I have often seen the greatest advantage and relief from opening a vein at the elbow.

The line of conduct now recommended is most advantageous in the early stage of an inflammation, when the local and general symptoms are the most violent, also in the young and robust and in those of full habit, when the local mischief and the general disturbance are aggravated and maintained by general plethora.

If we had the means of doing so, it would be useful to lay down clear and fixed rules for determining our choice in all cases between general and local bleeding. The presence of inflammatory fever is an additional reason for the former, while, on the other hand, it would not be absolutely contra-indicated by its absence. It is necessary sometimes to employ active depletion where febrile disturbance of the system is not present.

A stout man, of full habit, about forty, employed in a printing office, chiefly as compositor, had a sudden attack of the retina, with total loss of sight. He was immediately bled from the arm to twenty-six ounces. Cupping on the back of the neck was necessary on the next day, and it was repeated in two days more. Suitable internal treatment, including the use of mercury, was added after the venesection, and vision was completely restored in a fortnight.

The pulse will not afford the criterion. If it be full, strong, and hard, the indication for general bleeding is clear; but it is sometimes low and oppressed, particularly in affections of the head; sometimes small, but hard and wiry, as in inflammation of the peritoneum and bowels.

We must be guided principally by the local symptoms. When they indicate high inflammation, and there is reason to fear that such inflammation may cause serious mischief in important organs or structures, we must take active measures to arrest it. General bleeding is among the most efficacious, and certainly more so than local.

In treating acute inflammation of an important organ, especially in a robust or plethoric person, you must bleed largely, so as to produce a decided influence on the circulation, in order to arrest, through it, the local mischief. You cannot measure the quantity necessary for this purpose beforehand, and you must be guided by its effects. In order to produce the required influence on the vascular system, it may be necessary to take twenty, thirty, or more ounces of blood.

Bleeding to syncope is sometimes advantageous; if this is done in the outset, perhaps no further loss of blood may be necessary, and little if any physicking.

It has been more common on the Continent, at least in France and Italy, to take small quantities of blood and to repeat the abstraction frequently. A few ounces are taken night and morning, and the plan is persevered in for several successive days.

M. Boisseau, an intelligent modern writer, well acquainted with French practice, in speaking of bleeding in inflammatory fever, that is, local inflammation, attended with fever, says that we should not take less than eight ounces at each bleeding; that this quantity is rarely sufficient, so that it is

necessary to go to twelve or even sixteen ounces, the latter quantity being never exceeded. Professor Langenbeck, of Göttingen, says that he never takes more than eight or ten ounces. One cannot help concluding from these representations, either that there must be a great difference in constitutional power between the English and some Continental nations, or that the inflammatory diseases of the latter are milder and more manageable than our own.

It has been objected to the large bleedings which we sometimes find necessary, that they weaken. They certainly do so in one sense; that is their object. We think that the patient has too much blood, and that the heart is acting too powerfully; that he is too strong, if those circumstances are the criteria of strength. The object, however, is to stop the inflammation, to do it effectually, and at the same time safely. I cannot doubt that these points will be most completely secured by employing active means in an early stage. One large bleeding generally suffices. I never saw a patient labouring under a serious inflammation injured by one venesection, however large.

Will it contribute to the patient's strength, to let an inflammation run on for eight or ten days, instead of stopping it in one or two? On the other plan, the inflammation lasts for several days, and the bleedings go on, till the patient's vessels are drained; he is brought by the protraction of disease and the repetition of treatment into a state of the greatest debility. This method seems to me ingeniously contrived for allowing the patient to experience the full debilitating effect, both of the disease and the treatment. I cannot doubt that a large bleeding in the beginning is not only the most efficacious, but the most economical mode of proceeding as respects the patient's strength.*

* On the 9th of November a young woman applied to me, at the out-

The apprehension that bleeding employed for the cure of inflammation may bring on typhoid symptoms rests on this same dread of debility, a fear in this case completely groundless. There is real fear of weakness in inflammations, fear that the affected part may be weakened, *i. e.* have its function more or less seriously impaired by the continuance and the disorganizing effects of inflammation, fear that the constitution may be weakened by the prolonged duration of the constitutional disturbance excited by the local mischief. The active measures capable of preventing these occurrences will preserve the patient's strength.

Typhoid symptoms are not to be produced by loss of blood; they denote a peculiar condition, attended, it is true, with great reduction of strength, brought about by affection of the brain, primary or secondary, especially when it has proceeded to a certain extent.

The repetition of general bleeding, though rarely necessary, may be indicated by the continuance or the return of the

patient room, St. Bartholomew's Hospital, labouring under acute inflammation of the external tunics of the right eye. The conjunctiva was of bright-red colour, the vessels of the sclerotic full, and the cornea hazy. For the last three nights the agony of pain, extending from the diseased organ across the brow and over the temples, was such as to deprive her of any rest, night or day. I referred her to Mr. Lawrence, who admitted her into the hospital. Eighteen leeches were immediately applied to the right temples, and in the course of the evening twelve more. The good effect, after the second application, was immediate; the agonising pain, which was wearing her out, subsided; she was enabled to rest her head upon the pillow, and for the first time, for forty-eight hours, closed her eyes in refreshing sleep. She was ordered two grains of calomel and a third of a grain of opium, every four hours, until an effect was produced on the mouth. The patient recovered without a bad symptom, and with the complete use of the organ. What would have been her condition had the inflammatory excitement been allowed to pursue its course unchecked?—*H. Coote.*

circumstances which first required the depletion. We can point out no one circumstance to guide us in this matter, as we could not lay down any single indication for resorting to it originally.

The inflammatory state of the blood, in conjunction with the local symptoms, may authorise us to repeat venesection to a much smaller amount than in the first instance.

If local inflammation is accompanied by febrile constitutional disturbance, the digestive organs being disordered, and the secretions suspended or diminished, we find that when the secretions are restored, and the alimentary canal begins to act, the fever is diminished or cured. It is said that the fever is removed by the restoration of the secretions and of the functions of the alimentary canal. Perhaps it might be more correct to say that the secretions return, and the digestive organs are improved, because the fever is abated. However, assuming the first supposition, some persons say, "Do not bleed! Give opening medicines, and diaphoretics. Act on the bowels and skin, and you will thus get rid of the fever." Two, four, or more days, are often consumed in fruitless efforts of this kind; purgatives are given which do not purge, diaphoretics which do not diminish the heat and dryness of skin. The local disturbance increases; the general disorder gets worse and worse. Relief comes at last rather by the efforts of nature than as the result of medical means.

The treatment by direct depletion appears to great advantage when contrasted with this mode of proceeding, and shows us that the state of the skin and bowels may be immediately influenced through the circulation. Take away blood, and your objects are accomplished at once. When you have thus relieved the circulation from the load which

oppresses it, the natural action of the various parts is restored. Free perspiration comes on, the bowels are soon relieved, the urinary secretion is increased.

A notion has prevailed that the inhabitants of London and of other large cities do not bear bleeding, and that the depletion which is advantageously employed for removing inflammation in the residents of the country is neither safe nor proper in Londoners. This view, which is not set forth as a deduction from experience or argument, seems to be one of the commonplaces handed from one writer and teacher to another, without direct inquiry or examination. The inhabitants of London, from the highest to the lowest, for the most part indulge their appetites like the rest of the world, and they who live in the country do the same. Nowhere is the consumption of animal food and fermented liquors more general than in our metropolis. These habits, of which the injurious effects are aggravated in many instances by sedentary occupations or indolence, produce their natural results, a plethoric state of system and abundance of inflammatory diseases, both of which will soon be detected by the attentive observer in all classes. I am convinced that inflammations are as numerous and violent among cockneys as among countrymen, and I know that they can only be counteracted by the same means which are just as necessary and safe in the one case as in the other.

It would require long and close observation, with careful examination of corresponding classes in cities and the country, to determine whether there is any real difference between them in the respect above mentioned. I have not met with any allusion in reference to the capital and great cities of France or of other European countries. My own experience does not lead me to accept the notion above mentioned, or to

believe that there is any essential distinction in pathology and therapeutics between town and country. We must direct our practice in either situation not by any abstract principle, but by careful consideration of each case.

Local bleeding may be employed after general depletion, or alone in less violent and urgent cases.

When the local disturbance has been checked, and the secondary effects, constituting the state of sympathetic inflammatory fever, have been removed or lessened, the local abstraction of blood will accomplish all that remains to be done.

Our choice lies between two means, cupping and leeches; for scarifications and punctures are applicable to a few cases only, and hence not to be regarded as general means. Cupping is the more efficacious; we can succeed in getting a larger quantity of blood, and it is drawn more quickly, that is, if the operator be skilful. Cupping is not applicable in some situations, nor where the surface is inflamed, on account of the pain.

To be efficacious, leeches must be employed in greater numbers than are usually applied. In the adult it is seldom worth while to employ fewer than ten or twelve when we wish to check any inflammation decidedly, as in the eye; while in serious cases the number must be increased to two or three dozen.

When employed in such numbers, leeches are as effective as venesection, and sometimes more so. If, as commonly computed, each leech takes half an ounce of blood, a large quantity is drawn when three or four dozens are applied. When they can be placed on or very near to the seat of disease, as on an inflamed extremity or on the abdomen in peritonitis, they are peculiarly useful, abstracting as much blood as we should take by venesection, and drawing it from

the inflamed vessels themselves, so as immediately to unload them.

You will not, I trust, misunderstand my observations, so as to suppose that I recommend the loss of blood or particularly general bleeding in all cases. Remember that I have been speaking of acute inflammation, attended generally with inflammatory fever in cases of importance, either from the nature of the affected organ or the extent of the mischief. There are many inflammations in which it is not necessary to abstract blood, either generally or locally; there are others in which local bleeding answers every purpose, in conjunction with other means. You must consider, in particular instances, the importance of the affected part, the degree of disturbance, the probability that continuance of the inflammation may alter structure and impair function, also the presence or absence of constitutional disturbance. You must bear in mind the age, constitution, and habit of body, the general powers of the patient, and regulate your choice of means by a combined view of these several particulars.

When it is your object to arrest inflammation suddenly, on account of the importance of the organ, or the immediate urgency of the symptoms, or from apprehension of those structural changes which inflammation often produces, you will find it advantageous to employ general bleeding, and to take at once such a quantity of blood as will influence the circulation. You will thus arrest inflammation more effectually, and at less expense to the constitution, than by the repetition of smaller bleedings.

Should your own reflection satisfy you that the foregoing remarks on the loss of blood, as a therapeutic measure, are sound, you will not, I trust, be deterred from acting on them by the outcry and alarm raised against the practice of late years, which, originating on insufficient grounds, has been

taken up and repeated more as a matter of fashion and obedience to supposed authority than from the result of experience and observation. The plan once generally prevalent in country districts, of healthy persons being bled twice a year, in spring and fall, as a precautionary measure, would alone be a sufficient proof that blood has often been taken away incautiously and needlessly, while it may justify the belief that the practice has been less injurious than might have been expected. That the practice of taking away blood occasionally to a greater or less extent in the treatment of inflammatory disorders, which has prevailed universally wherever the science and art of medicine have been most successfully cultivated, may have been altogether a mistake, is possible. Stronger evidence and arguments than have yet been produced will be necessary to prove the point, and still more powerful proofs will be required to satisfy us that the opposite mode of combating such affections, by means of stimulants, including the free use of brandy, is either advantageous or safe. It would be a public misfortune if the sanction of professional authority should be given to a treatment calculated to encourage the pernicious habit of spirit-drinking.

Morbid effects of the loss of blood.—The loss of blood exerts a powerful influence over the animal economy, and hence its beneficial operation in the treatment of inflammations. Hence, too, serious dangers may result from its injudicious employment; from using it in cases where it is not required; from carrying it to too great extent, and most particularly from the frequent repetition of it to a large amount, especially under an erroneous estimate of the case and a misapprehension of the indications which it presents. Hence, in doubtful cases, great caution is required in determining on the measure originally, in fixing the quantity, and in resorting to its repetition.

When an active inflammation exists, the constitution bears the depletion; but injurious effects will surely ensue if loss of blood be resorted to where there is no inflammation, and especially if the symptoms thus produced should be mistaken, as they may be, for those of continued inflammation, so as to lead to a repetition of the depletion. You will hence see the necessity of abstaining from this measure unless a clear indication for it is presented by active inflammation of some organ or by general plethora, increased fulness and action of the vascular system generally.

The *morbid effects* are either immediate or remote. The immediate are syncope, in its various degrees, from slight faintness to fatal cessation of vascular action, convulsions, delirium, coma. Syncope occurs most easily in the erect posture; some faint so easily from loss of blood, that it is necessary to bleed them in the recumbent or horizontal position.

Syncope being the natural remedy for loss of blood and the natural mode of arresting it, gives no alarm to medical persons, though it frightens bystanders out of their wits. When the arm is bound up and the patient left quiet, he soon recovers. If remedies are required, they are the horizontal position (laying the patient at full length on the floor), smelling-salts and stimuli, such as wine, sal volatile, or brandy and water. I never saw the least ground for alarm from syncope in venesection, nor heard of a fatal termination. But such an event is, no doubt, possible. Care is required under particular circumstances, as in elderly persons, where much blood has been lost already, and in those labouring under disease of the heart or large vessels. It is not likely that venesection would be resorted to under such circumstances. If the case should present any uncertainty, and even independently of that, it would be well to observe carefully the effect of the depletion on the pulse.

Convulsions are alarming, but not dangerous; they occur more frequently in children, arising from interruption of the supply of blood to the brain, and thus resembling the effect of the opposite state of cerebral circulation, which also causes convulsions.

They are not unfrequently seen, in a slight degree, in conjunction with fainting from venesection.

Remedies.—Horizontal position and stimuli, hyoscyamus freely.

The most strongly marked case of this kind which I have seen was that of a man, who, having met with an accident in the street, was carried insensible into the shop of a neighbouring chemist, who proceeded to draw as much blood from the arm as would flow from the orifice. He was brought into the hospital, labouring under the most violent and alarming convulsions. They gave way slowly to the administration of henbane, with brandy and water, the head being shaved. It was an ordinary case of concussion, in which convalescence was not materially delayed by the well-meant but injudicious proceeding of the chemist.

Delirium is not strictly immediate; first, fainting is noticed, then delirium, as the circulation is restored and reaction ensues; a rare occurrence.

Mild cordials and narcotics, cold to the head. Blisters or sinapisms, if the affection continues.

Coma.—Most common in children; a state of deep sleep, approaching to apoplectic. This, as well as convulsions and delirium, shows how the sensorium may be influenced by disturbance in the supply of blood.

A similar state may be produced in children by excessive purging, and is apt to be confounded with hydrocephalus.

Quiet; fluid nourishment, such as beef tea. Perhaps

stimuli with caution. Beef tea; arrow-root, with a little wine; Spirit. Ammon. Aromat.

More remote effects.—Gradual exhaustion, and death; exhaustion, followed by reaction; increased frequency of pulse, after large bleedings.

Pulse not only more frequent, but throbbing and bounding; palpitation and increased action of heart; throbbing of the carotids; beating in the head; severe headache, with sounds of hammering or beating.

These, which are effects of the loss of blood, may be mistaken, and sometimes are, for indications of further depletion; these symptoms are, indeed, relieved by syncope, and thus are benefited, for the moment, by loss of blood; but they return in an aggravated form. General paleness of surface; blanched, waxy whiteness of countenance.*

Cold to the head; perhaps a few leeches to the temples. Nourishment and light stimuli. Beef tea; arrow-root, with brandy; ammonia; hyoscyamus; perhaps opium, with cordials. If it should be necessary to act on the bowels, clysters or mild and warm aperients.

Purgatives.—Bleeding directly accomplishes the primary indication in the treatment of inflammation, that of lessening the disturbance of the vascular system. It is not, however, sufficient to diminish the quantity of circulating fluids in this way; we must prevent the introduction of fresh supplies, by the employment of purgatives, and by regulating the diet, or rather enjoining abstinence.

Active purgatives are of use to remove whatever is contained in the stomach and bowels, to clear out the alimentary canal, a proceeding which affords great relief.

* More full account of these injurious effects of loss of blood, with illustrative cases, are found in Dr. Marshall Hall's book on the 'Morbid and Curative Effects of the Loss of Blood.'

You may employ calomel combined with jalap, compound extract of colocynth, or rhubarb.

Calomel alone, or with these combinations, followed by the common purging mixture of infusion of senna with salts and manna, or by castor oil.

The effect of purgatives is not confined to expelling from the digestive canal alimentary accumulations and unhealthy secretions; they stimulate the extensive mucous surfaces of the stomach and intestines, producing discharges from them, and act indirectly on the glands, which pour their fluids into the canal. By the repetition of such medicines, especially by the administration of saline aperients in small doses at short intervals, we keep up a constant discharge of watery fluids from this extensive surface, lessening the quantity of circulating fluids, and thus directly reducing vascular action. I need scarcely refer to the well-known debilitating effect of purging.

Purgatives probably contribute to arrest local inflammation in another way, on the principle of counter-irritation, by exciting the alimentary mucous membrane and drawing the circulating fluids to it in unusual quantity. Emetics, formerly used in the treatment of imflammation, probably act in this way, rather than by merely expelling the contents of the stomach. When an irritable state of the stomach, nausea, or sickness, occasions the rejection of medicines, we may employ those active means which are efficacious in small bulk, such as calomel alone or combined with a little opium; croton oil. Saline aperients in the effervescing form, are sometimes retained when others are rejected; Seidlitz powders. The infusion of senna, with Epsom or Rochelle salts, in the effervescing form; carbonate of soda added to the medicine, and lemon juice mixed at the time of taking it. When our purgatives are rejected by the stomach, we may

attack the alimentary canal by the other end and employ clysters. These are not to be trusted to solely, because they do not clear the stomach and upper bowels, nor do they operate on the mucous membrane and the secretions, like purgatives, by the mouth. They are often useful in aid of the latter.

Diet.—In cases of inflammation where we are employing the most powerful means of reducing increased action, we prohibit nourishment or food, and confine the patient to drinks, simply diluent, acidulated, or slightly mucilaginous. Cold water; toast water; barley water; apple or currant water; lemonade; tamarind water; imperial; weak tea.

The juice of grapes, currants, oranges.

In cases that do not require this strict discipline, ripe fruits, roasted apples, thin gruel, whey. A little toasted bread or biscuit with tea.

Solid animal food and fermented liquors, in all their shapes, are totally out of the question. They cannot fail to be injurious. The wishes and natural desires, especially of sensible persons, are to be regarded, so that the lighter forms of animal food may be allowed when strongly desired.

Loss of blood, purging, abstinence or starvation, these are the three great means of reducing inflammation, but there are other auxilliary measures. We naturally endeavour to remove the heat and dryness of skin, to produce perspiration. When that comes on naturally, relief is experienced, the fever subsides. Light covering and ventilation should be attended to; cold or tepid sponging may be employed.

Diaphoretics and *refrigerants*, or cooling medicines. Of the latter class, nitre has been held in great estimation; its solution in water produces cold, and its application to the tongue causes sense of coolness; hence the notion of its refrigerant powers, which are doubtful. However, it acts on the kidneys, and thus contributes to restore the secretions.

Liquor Ammoniæ Acetatis may be given in water, or Mistura Amygdalæ.

The alkaline carbonates of soda, potash, and ammonia, neutralized with lemon juice or citric acid, or the same combinations in the effervescing state, are at least grateful to the patient; they diminish thirst.

Saline draughts and mixtures, though commonly administered under the name of febrifuge remedies, are not of much efficacy in themselves. They are, however, convenient vehicles for more active substances, for saline purgatives, such as Epsom or Rochelle salt; for nitre, antimony, digitalis, colchicum.

The most powerful medicine for acting on the skin is *antimony*, more particularly in the two preparations of James's powder, a secret medicine, and the tartrate or potassio-tartrate. Its influence is not confined to the skin; according to the dose, the tartrate, a very powerful medicine, and much more so than the other, produces perspiration, nausea, sickness or purging. In these various operations it is an efficacious means of combating inflammation. To excite perspiration, it is given in doses of one eighth to one quarter of a grain, generally in combination with saline medicines; from one quarter to one half a grain, to cause nausea; from one half a grain upwards, it vomits and purges. If such doses are repeated at short intervals, so as to maintain the effect, perhaps there is no more powerful means, by internal medicine, of lessening the power of the heart's action. The number and strength of the pulse are rapidly reduced under the continuance of nausea and sickness thus produced. Of late years the Italian physicians have employed the tartrate of antimony in larger doses than I have mentioned, not to sweat or vomit, but, from observing its powerful effects in combating inflammation. They exhibit it as a *contra-stimulant*, considering it the most efficacious of that class. This seems

to me merely our old acquaintance, *antiphlogistic,* under a new name. The two terms, so far as I can judge, are precisely equivalent. It is administered, for this purpose, in the quantity of one or two grains every two or three hours; even oftener. The Italian physicians are said to have carried it to the extent of a scruple or even half a drachm in twenty-four hours.

When thus employed, I mean in doses of half a grain to one and even two grains, one or two of the first doses often cause vomiting; afterwards the stomach becomes accustomed to the remedy, and receives it without repugnance. It sometimes purges, and sometimes sweats, but often, without producing any such effect, it exerts a decided influence in abating the inflammation.

The stomach is said to tolerate the remedy more readily when an active inflammation exists, requiring its use.

Sometimes every dose causes vomiting, so that we cannot persevere with it.

I have exhibited the tartrate of antimony frequently on this plan, and with great advantage, but have not carried the dose beyond two grains. A consideration of the effect which it produces on the skin, in external use, would deter me from introducing it in large quantities into the alimentary canal. It is useful when it vomits, purges, or sweats; but it may also be of service without causing any of these effects.

It cannot be regarded as superseding the loss of blood, but it lessens the necessity for repeated venesections. It may be employed with advantage after bleeding, and in cases where, having already resorted to direct depletion, we doubt the propriety of its repetition. I have used it principally in inflammations of the chest, in pleurisy, pneumonia properly so called, and bronchitis, often with great advantage, never with bad effect. In grain-doses it is often very serviceable in the latter case. The following

is one of the first cases, in which I tried the remedy on the Italian plan, and it affords a good example of its advantages. In the winter of 1843-4, I saw a youth, about ten years of age, on the fifth or sixth day of a severe inflammatory attack in the chest. He had been similarly affected before, the disease having been obstinate and the convalescence tedious. He had now been actively and judiciously treated, had been bled three times, but without making any impression on the disease. There was a hard, dry cough, preventing rest, with a pulse of 110. I tried mercury, calomel, with James's powder, giving two grains every four or six hours. In three days salivation was produced, with some alleviation of symptoms, but no reduction of the pulse nor change in the cough. I resorted to the tartrate of antimony, and gave a grain in an ounce of cinnamon water every four hours. The stomach bore it well, and I increased the dose in two days to a grain and a half. He went on with it nearly three weeks, the symptoms yielding regularly and most favorably. The issue of the case was more rapidly and completely successful than I could have anticipated. He took, during this time, five doses, on an average, in the twenty-four hours; sometimes the stomach rejected its contents, without effort or distress, once in twenty-four hours. It was necessary to give occasional aperients.

James's powder may be advantageously combined with calomel when the latter is employed as a purgative; or in a regular way, with a view to its power in arresting inflammation.

The tartrate of antimony in small doses is usefully joined with saline purgatives, such as Epsom salts.

Another remedy, of still greater power, in the treatment of inflammations is mercury, especially in the form of calomel. This remedy is very useful as a purgative, either alone or in

combination with other means. Again, small doses of calomel, or of grey powder, given at moderate intervals, are of great service in general feverish disturbance of the system, whether sympathetic or idiopathic, by promoting the secretions and acting on the bowels. They may be used advantageously in this way whenever in such cases the tongue is foul or the mouth dry. But if we were to regard mercurial preparations merely as purgatives or correctives of unhealthy secretions, our notions of their powers would be limited and imperfect.

Common experience has established the practical fact that mercury, especially calomel, exhibited freely after bleeding and other evacuations, has the best effect in removing the remaining symptoms, in preventing the changes of structure which continued inflammation will produce, and thus in rendering recovery more speedy and complete.

Two grains of calomel alone, or combined with James's powder, or with opium, may be given every six or eight hours, for one, two, or more days. When the mouth has been affected, which shows that the constitution is influenced by the remedy, the progress of recovery is accelerated, the symptoms sometimes not yielding decidedly till this takes place. Such being the fact, recognised by observation, what is the explanation?

Iritis affords a favorable opportunity for observing the mode in which mercury acts. This affection is accompanied by the effusion of fibrine, either interstitially or in small portions on the surface or at the edge of the pupil. Under the mercurial influence the deposition of fibrine is arrested, and that which had been deposited is absorbed.

The free use of mercury has been found very serviceable in croup, in that peculiar inflammation of the mucous membrane of the trachea and its branches in which fibrine is effused, so as to form an adventitious lining to the part.

Again, the same remedy is employed with advantage in inflammations of serous membranes, the pericardium, peritoneum, and pleura, in which abundant effusion of albumen and fibrine is the most striking feature. Are we not warranted in the general inference that mercury possesses the power of controlling that disturbed state of the capillaries on which the effusions above mentioned depend, and of thus preventing the changes of structure which they might produce.

As fibrine disappears before our eyes in iritis under the influence of mercury, and as we cannot doubt that the albumino-fibrinous effusions of inflamed serous membranes are removed in the same way under the same treatment, the beneficial action of mercury has been said to be that of exciting absorption, to which its efficacy as an alterative in chronic enlargements had been formerly ascribed. We must, however, ascend a step higher in the analysis, in order to appreciate correctly the singular action of this remedy, and we shall be authorised, if I mistake not, to ascribe to it the power of arresting that disturbed condition of the capillaries which is the essence of inflammation. The morbid products are removed, because the inflammation is at an end. Thus, the swelling of an inflamed hand disappears when the inflammation has been arrested. The absorption of the effused fibrine would not be to much purpose if the inflammation causing its effusion still continued.

If this be a just view of its powers, mercury is pre-eminently and above all others the antiphlogistic remedy. It is not, however, safe to use it in the manner now described, until the violence of the attack has been checked by previous evacuations.

Digitalis lowers the pulse and acts on the kidneys. It is an uncertain remedy, and in larger doses unsafe. Hence it is not generally used.

Colchicum acts on the alimentary canal and on the kidneys; on the former violently, and even dangerously, in free doses. It is chiefly employed in gout and rheumatism.

Counter-irritation.—It has been observed, when a new disease appears, that one previously existing is lessened or removed. When the testicle inflames in gonorrhœa, the affection of the urethra subsides or ceases. The inflammation of the testicle has been ascribed to the stoppage of the discharge. It is more probable that the urethral disease stops because the testicle has become inflamed. Inflammation of the eye in a child ceases when the ears become sore, and *vice versâ;* internal disorders, or an attack of gout or rheumatism, are soon arrested by an eruption, and the reverse. We imitate this process of nature by making an artificial new disease in order to get rid of a previously existing malady. This is *counter-irritation, i.e.* a new-irritation contra or opposed to one previously existing.

Revulsion, from *revello,* implies that the new disease tears away, forcibly displaces, the other.

Derivation, from the Latin, means turning aside a stream. Leeches are supposed to draw the fluids from an inflamed part to the outlets produced by their application, and a similar action is ascribed to the discharges caused by counter-irritation. Thus, counter-irritation, revulsion, and derivation, are allied in meaning.

Counter-irritation in acute inflammation is generally accomplished by blistering the skin, either by means of a plaster in which the cantharides or Lyttæ, the irritating material, are incorporated, or by a blistering tissue or fluid which owe their power to the active principle (cantharidine) extracted from the Spanish insects. There are other means, *e.g.* hot or boiling water or pure *Liquor Ammoniæ,* or Sir

A. Carlisle's plan of blistering by means of iron plunged in hot water, which act immediately.

Sinapisms operate more quickly than blisters: according to their strength and the duration of the application they either redden the skin or blister.

To afford a reasonable chance of success, the new irritation must be more powerful than that which it is designed to supersede. An active inflammation, in its full development, yet unchecked, with its train of sympathetic effects, cannot be stopped by the minor disturbance of a blister. Blisters, under such circumstances, instead of checking the disease, increase the general disturbance, and thus aggravate the patient's sufferings. This mode of proceeding, then, is to be resorted to when depletion and the other means already described have lessened the local disturbance and removed the constitutional effects; towards the end of inflammation, when it seems likely to become chronic; or as a remedy against the pain and sense of weakness which may remain after the other symptoms have come to an end.

Another caution in the use of blisters is not to place them so near the suffering organ as to include it in the circle of irritation. I have seen aggravation of suffering from neglect of this rule, in placing a blister on the temple so near to the eye as to increase the irritation in the part. The assemblage of measures just detailed, both dietetic and remedial, constitutes the *antiphlogistic treatment* or plan, the treatment opposed to inflammation. The means which refer to diet and general management constitute the *antiphlogistic regimen.*

Local applications.—Although these are of much less importance than general means in the treatment of inflammation, they are often useful auxiliaries; this is particularly the case in external inflammation; to a great part of internal inflammatory affections they are obviously inapplicable.

Cold.—The increased heat of inflamed parts would lead naturally to the application of cold water. Patients would of themselves apply cold fluids to relieve the burning heat of an inflamed part. The external application of cold lessens vascular disturbance, causing contraction of the distended vessels, and consequently diminution of redness and heat. The general and local effects of cold are similar; when carried to the full extent, it is capable of arresting vital action altogether. Torpor, insensibility, reduction and cessation of circulation, even death, ensues from continued general exposure. In a part so affected you remark a deathy paleness, from stoppage of circulation, as frostbite, in which, unless judiciously managed, ends in mortification.

Thus, by the judicious application of cold we can lessen the temperature of an external part, not only with relief to the patient's feelings but with corresponding diminution of the inflammation.

The well-known effect of cold in checking hæmorrhage shows its influence on the vascular system. Its utility is not confined to external inflammations; parts not far below the surface experience the beneficial effects of cold applied externally, as in diseases of joints and of the cranial contents. For the purpose of producing the desired effects, we generally apply fluids called lotions or washes. Folded linen or lint, dipped in water and squeezed, so as to be wet but not dripping, laid on the part and frequently renewed, or frequent sponging so as to keep the surface moist, are suitable means. Lotions or washes are applied cold, but the effectual cooling of a part, for the purpose of abating and removing inflammation, does not depend so much on the low temperature of the liquid as on its evaporation. We must, therefore, employ our lotions in such a way that they may evaporate, hence called evaporating lotions. For this purpose the part, when

covered by the wetted rag or spunged over, must be exposed to the air, and its temperature will soon be reduced. If you leave a patient to himself, he covers the part with bandage, with dress, or bedclothes, so as to heat it, and convert the process into fomentation.

Applications.—Cold water; fresh spring-water; vinegar and water (oxyerat); rose-water; iced water. Saturnine or lead lotion, popularly known and trusted under the name of Goulard. No efficacy is ascribed to the lead. Alcohol or ether may be added to a lotion to increase evaporation.

Spirit lotion consists of two ounces of rectified spirit or spirit of rosemary to six or eight of rose-water or saturnine lotion. Liq. Ammon.Acet., with spirit and rose-water, forms an agreeable lotion.

Alcohol or ether, evaporated by a current of air, would lessen temperature very considerably. When ice is employed for cooling a part, it should be pounded and put into a bladder till it is half or two thirds full; or freezing mixtures formed by dissolving salts in cold water may be used when it is wished to make the cold more intense. The operation of cold on internal parts is seen in the head, by placing on it a bladder half full of cold spring-water, removing it as soon as it becomes warm, or more effectually by means of an ice cap.

A powerful influence is produced on the internal parts by the cold douche, that is, by pouring a stream of cold water on the head from a height of a few feet; this cannot be borne long. The cold must not be continued when the temperature has been reduced, or the part would be chilled and become aching.

Warm applications.—There are cases in which patients dislike the impression of cold, and prefer warm applications. Occasionally, when the former have been continued for some time, a change is desired. Whenever warmth is found most

agreeable to the patient's feelings, the local application should be warm. The lotions already described may be applied tepid, so as to avoid the uneasy feeling caused by cold. Warm fomentations are effected by flannels immersed in hot water, wrung out in a coarse towel, applied to the part and frequently renewed. If this plan is followed up effectively, the flannels being hot and large, they sometimes excite general perspiration.

We read of mucilaginous and narcotic fomentations, as prepared by decoctions of marsh mallow, chamomile, poppy, hemlock, henbane and other herbs; unctuous applications are also mentioned, containing some greasy matter. Although these probably act only as means of applying warmth and moisture, patients have faith in their virtues, and the narcotics, when strong, may have some soothing effect.

Bran, on which hot water has been poured, or warm grain, in a linen or flannel bag, will be found convenient by retaining warmth and moisture for a long time, when frequent changes might be troublesome or injurious; a bag of warm salt may be used when dry warmth is required.

Poultices are made of bread, or linseed well-powdered. They should be prepared with boiling water. No positive rules have been hitherto laid down for distinguishing the cases to which cold and warm applications are respectively most applicable. Perhaps cold may be preferable in incipient inflammations of external parts, warm when the inflammation is fully developed or seated below the surface. Warmth with moisture, seems to exert a relaxing influence when fibrous structures are involved, as in the case of inflamed joints.

The means which have been described are to be repeated and continued in some shape or degree until the inflammation is removed. A cautious course should be pursued for a short time, until the healthy state of the affected part and of the

body generally is restored, and all fear of relapse is gone. Our object now is to guard against fresh excitement, to which the part remains liable for some time.

The state of the bowels must be attended to. The diet must still be regulated in quantity and quality, though the rules applicable to active inflammation are no longer necessary. In general, it should be light and nutritious, but not stimulating, until the normal state of the affected organ and function is completely restored. Patients and their friends are afraid of weakness, and anxious to resume the enjoyments of the table; medical men too often sanctioning and indulging these notions. Dr. Baillie remarked that he had hardly ever seen a relapse in fever that could not be traced to imprudence in diet.

The strength is often reduced by active disease and by the means employed to remove it; patients feel and look weak; they are anxious for measures calculated to restore strength. In those of good constitution, in whom disease has been promptly and efficaciously treated, recovery follows by the natural powers of the system, without strengthening medicines.

The improvement of diet and the return of appetite are sufficient. It is necessary to be cautious against premature indulgence. If inflammation be treated on the expectant system, and allowed to run on, patients will be much weakened, and require a course of tonics.

When the powers are considerably reduced, from the duration of disease, especially in elderly persons or those of unsound constitutions, good air, quiet of body and mind, nourishing diet with cordials, will be the best restoratives. The dilute mineral acids, vegetable tonics, bark in its various preparations, cusparia, cascarilla may be resorted to. When the digestive powers are deficient, vegetable bitters, calumba, gentian, quassia, camomile, or hop, may be taken, perhaps

with rhubarb. As medicines act better in combination than singly, acids may be given with tonics and bitters; the vegetable infusions may be combined with ammonia and tinctures.

Treatment of chronic inflammation.—If acute inflammation be actively treated, you will have no chronic stage; the disturbance is arrested, and the part recovers its natural powers. If, however, the treatment has been inert, or not followed up with sufficient perseverance; if the general management in diet and other points has not corresponded to the medical means; if the patient has been imprudent and unmanageable; the local disturbance goes on, becomes habitual, and great difficulty may be experienced in arresting it. The word chronic merely means lengthened or protracted; a chronic inflammation, therefore, is one that has lasted a considerable time.

Or, the inflammation, having still the usual symptoms, may have a milder character and slower progress from the beginning.

Again, chronic inflammation, although bearing the same name, may be a very different affair from acute, not showing signs of active vascular disturbance, but causing enlargement by interstitial deposition. This form arises from unhealthiness of constitution, and the patients are frequently scrofulous.

In either of the first two cases, although the local symptoms are slighter in degree, and the sympathetic effects inconsiderable or not observable, the disease is essentially the same as in active inflammation: it is vascular disturbance, and must be combated by means milder in degree but similar in chararacter to those employed in the more acute period.

Local abstraction of blood, by cupping or leeches, may be necessary, especially in a robust and plethoric person, where

the complaint may have obviously originated in and is maintained by fulness of habit; in affections of important parts, such as the head or retina; or where disease is extensive, as in inflammation and ulceration of a limb.

It is a matter of consequence to regulate the digestive organs. You would first clear out the alimentary canal by suitable aperients, and then use such means as will keep it in good order without purging. We want to have the fecal residue of the food expelled without watery evacuations. Aloetic medicines, colocynth, and rhubarb, answer. If the colour of the evacuations is unhealthy, mercurial preparations, which excite the secretions of the digestive apparatus, may be usefully combined with the purgative; they certainly impart a healthier colour to the motions. Extract of colocynth; aloes; extract of rhubarb, with calomel or blue pill, are suitable combinations. An occasional dose of rhubarb, with magnesia and sulphate of potash; of senna mixture; of castor oil, or of aloes and rhubarb, either in pills or in the combination of Infus. Rhei with Decoct. Aloes comp.

The administration of mercury is advantageous, though the effect is slower than in acute inflammation. It often exerts a marked influence in arresting the mischief and in removing interstitial deposition. It acts as powerfully in chronic as in acute iritis. As the danger of disorganization is not so imminent, we administer it in the mildest form and in moderate doses. Three or four grains of grey powder or blue pill, once or twice in the twenty-four hours, will answer the purpose. That mercury in small doses, continued for a more or less considerable time, is of use in such cases, has been established as the result of general experience. These doses and this mode have been called alterative, in the belief that they change or alter the state of parts by a gradual agency, without any violent action. It may sometimes be advan-

tageous to carry the use of the remedy rather beyond this alterative plan.

Diet must be regulated in chronic as well as in acute inflammation. It is just as necessary to determine what a patient shall eat and drink as to prescribe medicine. In the treatment of diseases, if you content yourselves with ordering the latter, and leave the patient in other respects to his own devices and desires, you will be beaten in many instances. He will do himself more mischief by what he puts into his stomach than you can do him good by physic. A large proportion of diseases is caused or aggravated by errors in diet; inattention to it often frustrates curative effects in themselves judicious; imprudent indulgence may cause relapse of acute disease. During the existence of inflammatory disease, fermented liquors should, in general, be prohibited; animal food may be allowed cautiously in slighter cases and as recovery is advancing. The use both of meat and stimuli may be not only advantageous but necessary in constitutions weakened by age, long suffering, or other causes. Bread, biscuit, and other farinaceous articles, milk, broth, gruel, tea, vegetables and ripe fruits, form an intermediate bill of fare between that of health and fever diet. Such articles will sustain the human race in full health and strength, enabling them to undertake and execute all kinds of exertion, bodily and mental. There are populous nations of vegetable eaters. When all excitement is gone, local and general, when the tongue is moist and clean, and the appetite good, when the patient can take exercise and sleep well, *i. e.* when he is well, he may resume the diet and habits of health.

Counter-irritation.—Blisters may be employed in acute as well as in chronic inflammation. It is better to repeat them than to attempt keeping up a discharge from the blistered sur-

face by the savine ointment. I have seen this very injurious in weak children, even to the extent of causing sloughing.

The following ammoniacal application spread on lint is said to be mild and safe for children. *Pommade Ammoniacale:* Lard, 4 parts; Mutton suet, 1; Liq. Ammon., 5. The lard and suet melted together, but not hot; then add the Liq. Ammon.

Friction on the neighbouring skin of the emetic-tartar ointment. One part of the Tartrate to three of lard, rubbed once or twice in the twenty-four hours, produces pimples, pustules, and superficial sloughs. A succession of these may be produced by rubbing in fresh places. Croton oil alone or with olive oil acts in a similar way.

Seton issue, or moxa, are occasionally used in severe cases. The peas or other substances used to keep issues open are often productive of great pain. This is avoided in moxas. Frictions over the part with stimulating liniments, containing Liquor Ammoniæ, Tinct. Lyttæ, Oleum origani, camphor.

Ol. Oliv., ℥iss;
Acid Sulph., ʒiss;
Ol. Tereb., ℥ss.

Local means. Fomentation; poultice; cold lotions less frequently. Mercury locally, in reference to its specific effect in checking the inflammatory process.

Frictions with mercurial ointment or liniment. Emplastr. Hydrarg.; Emp. Hydr. cum Ammon.

Iodine.—Ung. Potassæ Hydriodatis; Ung. Iodinii, ϑj ad ʒj; iodine internally; or the ioduret of mercury in ointment.

CHAPTER V.

SPONTANEOUS INFLAMMATIONS, AND THE UNHEALTHY STATES OF CONSTITUTION TO WHICH THEY OWE THEIR ORIGIN.

Having concluded the observations I had to offer to you respecting the treatment of those inflammations in which our attention and our curative efforts are principally directed to the suffering organ, with the view of speedily arresting disease, I must now revert to another and very large class of inflammatory affections, which I have already mentioned incidentally, viz., the spontaneous inflammations in which our views respecting the causes and mode of origin are different, and our treatment consequently exhibits corresponding modifications.

Numerous inflammations, more particularly of the chronic kind, come on without any obvious exciting cause; in common language, they are said to come of themselves. To understand their origin we must look beyond the part, and careful research will enable us to explain the matter satisfactorily. We discover deviations from the healthy state of some important functions, and as these disturbances are found in parts of general influence, the digestive organs, for example, we say, speaking perhaps rather loosely, that the constitution is unhealthy.

However, as these states of constitutional unhealthiness give birth to a numerous and dissimilar progeny of local

affections, it is necessary to consider carefully how they are produced, what are their characters, how they can be remedied. These considerations, in short, involve the origin, nature, and treatment of a large tribe of local diseases, of inflammations acute and chronic, of suppurations, ulcerations, indurations, enlargements. How little is to be done by merely local means in most diseases of the skin, in gouty and rheumatic disorders, in the numerous tribe of scrofulous complaints, and a great variety of other maladies. You will not, therefore, be prepared to understand or treat effectively a large portion both of medical and surgical diseases, unless you know the remote causes of those numerous ailments, which seem to spring up spontaneously, but which must be referred either to disorder of some principal system, for example, that of the digestive organs, or to a general unhealthiness, of which such disorder has been the primary source and is a leading feature. As these causes act slowly and almost insensibly, they often escape the notice of patients themselves, and even elude superficial investigation. They are only to be discovered by a close and searching examination, which should embrace the sanitary history of the individual, his diet and habits, mental and bodily occupations, and the condition of all the important functions. Unless this inquiry is carried out rigidly, the real nature of the mischief will often escape detection.

The predisposing cause of disease often consists in a state which is called, in common language, fulness of habit, while it bears the learned name of plethora, the latter being a Greek word, signifying fulness, and having been adopted into our own language under the pronunciation of pleth′-ora.

The ordinary working of the animal machine is attended with wear and tear. There is a constant and considerable expenditure of materials in the various vital movements of

our complicated frame; hence the necessity of the new supplies, which are received into the digestive organs, and brought by their action into a fit state for admixture with the mass of circulating nutriment. A great portion of mankind, led away by the gratification incidental to the indulgence of those appetites which are designed to secure an object of primary importance in the animal economy, introduce a larger quantity of new supplies than the wants of the body require. There is excess of nutrition; the system becomes overfilled.

The abundant supply of new matter causes at first a more vigorous exertion of all parts, by which the excess is disposed of. The actions of the vascular system are more energetic; there is actually increased nutrition, with augmentation of bulk, and all the external appearances of health and strength.

Sooner or later a state approaching to disease is produced; the pulse is full, easily accelerated; tongue occasionally white; heat and thirst are often experienced. Perspiration is easily excited.

This state is plethora, from excess of nutrition; but the organs are not yet diseased; it is the first step from the state of health towards disease. Individuals thus circumstanced are in constant danger of disease; a little additional excitement, or some trifling cause brings it on. Local inflammation easily occurs, and it has the acute inflammatory character.

Common experience has established the truth that this external appearance of exuberant health is apt to lead to disease. In common life it is considered dangerous to be congratulated on one's good looks. When a person has been suddenly cut off by acute disease, we often hear the observation that it was quite unexpected, that Mr. — had appeared remarkably well just before his attack.

A very long time ago I was intimately acquainted with a young physician of spare habit, active mind and body, zealously pursuing his profession, and taking much walking exercise, with excellent health. Meeting with deserved success he found it necessary to leave off walking and to keep a carriage. Having agreeable manners and social habits, he lived much in society when the mode of living was freer than at present, though he did not commit excess. He soon began to increase in bulk, and was joked by his friends on the subject. It was his custom to celebrate his birthday by a jovial meeting, which was concluded by a bowl of punch after supper. On the last occasion he had been in excellent health, and was perfectly well next morning when he left home in his carriage. Having occasion to draw up the blind he found the right arm motionless and the leg very stiff; it was an attack of hemiplegia, which obliged him to give up his profession: after surviving for a few years, he sunk under advancing disease of the brain.

The state of plethora, and its effect in producing local inflammation are evidenced in gout, especially in the beginning of the disease. The following is the order and connexion of the phenomena: luxurious indulgence in the pleasures of the table, and indolence; hence, fulness of system, and disturbance of functions as premonitory symptoms; then violent local inflammation. The latter and other analogous affections are natural efforts at relief; safety valves, by which exuberant nutrition escapes. In many other instances the dependence of the local inflammation on the state of constitution will be found nearly as evident as in gout, on careful investigation.

To regard the appearance of the local disease as the beginning of the mischief, in such a case, would be a great error in pathology; the affection of the part is merely a symptom

of constitutional unhealthiness, produced by causes which have been long in operation.

Is the term plethora literally correct?

It has been questioned whether the vessels really contain more blood in such cases, and consequently whether the term plethora be literally correct. This is a point difficult to determine. We do not know what the natural, regular or normal quantity of blood is; we have no means of ascertaining how much the vessels contain in a given instance; thus we want data for comparison. We cannot be certain that an individual in the state I have mentioned has more blood in his vessels than at another time. Yet we often find unnatural fulness and strength of pulse; it is accelerated by slight exertion. The blood sometimes exhibits the inflammatory characters. Hence, whether the quantity of blood be greater or not, the vascular system is in an unhealthy condition. It is a state like that of females in whom menstruation has been suppressed, or has not occurred at the proper period, where we often see flushed countenance, pain of head, and heat of surface. It is a similar state to that of persons in whom large ulcers have healed rapidly. The superficial veins of the limbs are fuller and more prominent than usual, and I cannot help thinking that there is an increased quantity of blood, which we sometimes find it advantageous to diminish.

Acute inflammation occurring in a plethoric person requires active antiphlogistic treatment, both on account of the local malady, and of the plethoric state of constitution. We seldom have to treat the latter alone, because persons thus circumstanced do not consider themselves ill. If we had, two means would be sufficient, viz., depletion and abstinence, the former to bring down the system to a safe point in the scale of health, the latter to prevent it from becoming again

overfilled. I do not use the term to point out loss of blood; moderate living and strong exercise would be advisable.

If the errors in diet, which originally caused the state of plethora are continued; if excessive supplies are still poured in, so as to increase the load which already oppresses the system, the organs cannot dispose of them; their functions become disordered, and a state of system ensues very different from that just described.

The stomach, as might be expected, suffers first: when digestion, the first and most important step in assimilation, is performed imperfectly, the associated and subsequent processes of biliary and pancreatic secretion, chylification, lacteal absorption, urinary, fæcal and cutaneous excretion are necessarily interrupted or impaired. The effects of disorder in these central and important functions must be felt in all parts.

The alimentary canal and the organs connected with it supply the new materials for the repair and growth of the body, and for its various internal movements; and it disposes of the alimentary residue after the nutriment has been extracted from it. When healthy supplies are produced, all the animal actions, bodily and mental, are carried on properly; the body is active, the mind is alert, and a general feeling of health and vigour pervades the frame. On the contrary, when the alimentary canal is filled with undigested matters and unhealthy secretions, the composition of the blood must become vitiated, and the materials of disease, rather than of health, are distributed over the frame. Hence the nutrition of the body suffers: we cannot be surprised that any part should become diseased; that any corporeal or mental function should become disturbed.

The symptoms which characterise the state of an individual thus circumstanced, are referable to three points. 1. Dis-

order of the chylopoietic organs. 2. Deficient performance of the excretions, by which the residue of digestion and superfluous alimentary matter should be removed from the system; and, 3. Unhealthy nutrition of the body generally.

If we regarded merely the origin of the mischief, we might call this state, with Mr. Abernethy, disorder of the digestive organs; but this name, although it points to the source of the evil, is too limited to express the general unhealthiness which is the ultimate result.

Here I think it necessary to caution you against the erroneous estimate of the cause and nature of the mischief, which might be deduced from a superficial view of the matter, especially in its earlier stages. When the organs of digestion and excretion, being surcharged and oppressed, are found unequal to the burden, and begin to fail in their offices, sensations of weakness are experienced, which are almost invariably misinterpreted by the patient. Indeed, medical persons not unfrequently misunderstand their source and nature, and thus direct treatment which aggravates the mischief. A person, who has long indulged his appetite freely, and enjoyed good health, begins to experience inconvenience; he is flushed, drowsy, and inactive after meals; the stomach is uneasy and flatulent, the bowels are costive; the appetite fails, especially in the morning; the rest is imperfect; the spirits and the powers of bodily exertion are impaired. There is a general feeling of weakness, and the patient fancies that he wants strengthening, that it would be better for him to eat and drink more, and to take more stimulating articles. Some of these, for instance spirits, cause temporary excitement, with sense of increased power. Medical advice is sought as the mischief increases. The failure in the office of the stomach being the most prominent circumstance, the case is regarded as indigestion; tonics,

stimulants, and cordials, with good diet are recommended, and thus the matter proceeds until nature relieves herself by some acute disease, or some feverish disturbance.

Causes.—You will see clearly enough, from the preceding remarks, how I think that these unhealthy states of constitution are produced. If you should doubt whether the explanation is adequate, remember that habits of diet operate powerfully, because they are in constant action. The cause is incessant; it is applied day after day and year after year. When you interrogate a patient respecting his habits, he says that he is temperate, because he takes only some beer, a few glasses of wine, and some spirit daily. You must multiply these quantities by 365, to come at a year's consumption; and then you will see what a quantity of stimulating fluid passes over the mucous membrane of the alimentary canal.

But excess, or even imprudence in diet is not necessary to produce these unhealthy states, although it is a frequent cause, especially among the rich. They may he brought on by circumstances which act primarily on the nervous system and disturb the digestion, assimilation, and nutrition secondarily. Mere bodily inactivity weakens the digestive organs, and interrupts or suspends the excretions. They who follow laborious occupations, or take much strong exercise, can indulge their appetites with comparative impunity. The vigorous action of the excretory organs clears off the redundance of nutriment. The sedentary and inactive must be sober and temperate. Hence moderation in diet is especially necessary to those who are confined to bed by disease.

Among the causes which exert a direct depressing influence on the nerves are the following: sedentary occupation, with long hours of labour, often with unwholesome or insufficient nourishment, especially when pursued in confined

and crowded dwellings, and in the bad air of narrow courts and streets; excessive mental exertion and overwork of the brain; the cares of life inseparable from the immense activity and constant struggle of modern times; long-continued anxiety, distress, and affliction.

Examples of disturbed digestion from mental influences occur frequently, such as sudden loss of appetite from distressing intelligence. I saw an Irish milk-woman, previously in good health, with sudden and entire suspension of the digestive process and total loss of appetite, from anxiety respecting an only son then under my care in the hospital, She had feared that it was intended to amputate the leg. When reassured on this point she quickly regained health and appetite.

As these unhealthy states of constitution are brought about slowly and almost insensibly, they often escape for a time the notice of those in whom they occur. Thus when we ask a person who consults us for a local complaint whether he is in good health, we are generally answered in the affirmative, and if we put a question or two indicating doubt on the point we shall probably be assured that he is perfectly well. The notions of health entertained by those who have not reflected on the subject are generally loose and vague. They who do not suffer actual uneasiness or inconvenience and are able to pursue their ordinary avocations, believe and call themselves well, when a careful examination of the various functions would lead to a different report. A spontaneous outbreak of disease is a clear proof that some part of the animal machinery is out of order, and our first duty is to detect the source of mischief and to remedy it, if possible. In its milder forms and earlier stages the discovery may not be perfectly easy; but a close scrutiny cannot fail to show us the truth. When the mischief is of long date, begun by

neglect and mismanagement, the results are too various and obvious to escape even superficial observation.

In order to ascertain the state of health in an individual, the various functions must be systematically examined. A person in perfect health should not be conscious that he has a stomach and intestinal canal. If, therefore, the introduction of food should excite, more or less immediately, uneasiness in any form or degree, more especially if it amount to pain or cause tenderness on pressure in the epigastric region, and further, if there should be flatulence, acidity, or the other annoyances referred to dyspepsia, there is imperfection of digestion, and the habits of diet are in fault. Appetite may be irregular, either deficient or capricious. There is sometimes craving for food, which leads to overloading the stomach. The appearance of the tongue generally depends on the state of the stomach; when that organ is disordered it is seldom clean, but covered by a whitish, greyish, or yellowish coating; it is greyish, with red edge and tip, in gastro-intestinal affections; it is seldom quite clean in the regular inhabitants of London.

Irregularity in the expulsion of the fæces often exists, generally also costiveness, followed sometimes by, or alternating with griping and purging. The discharges indicate clearly an unnatural state of the biliary and intestinal secretions, and a defective execution of those changes which the food undergoes before the expulsion of its residue. It is not necessary to detail the peculiar colour, consistence and other properties of that singular animal product, a healthy stool, or the deviation of its natural colour into various lighter or darker tints, as those of clay, mud, or even the blackness of pitch.

The intestines sometimes contain an accumulation of fæcal matter, although motions may have been produced.

There may be liquid evacuations when more consistent matters in considerable masses, and even the hard lumps called scybala, remain in the canal.

The colour of the motions depends principally, but not exclusively on the liver. Various kinds of food and medicine such as spinach and steel exert their influence. The great size of the liver, its peculiar organization and circulation lead to the conclusion that it must perform an important part in the changes which the nutritive mass undergoes after leaving the stomach, and in fæcal excretion, though the exact nature and extent of this influence is not yet clearly explained. Its affections in these cases are obscure, and hardly appreciable by external examination; we judge of of its state by the colour of the evacuations; and it may contribute to the tenderness occasionally observed in the epigastric region.

Changes in the urinary secretion may be expected when the functions of the stomach, intestines, and liver are perverted, as it is an important office of the kidney to separate from the blood the residual portion of the new matter introduced by the lacteals. The urine, although clear when passed, becomes cloudy on cooling; it contains too much acid, and throws down deposits of lithate of ammonia in various shapes, or sometimes crystals of lithic acid; it may be deficient in quantity, and high coloured.

Persons conversant with horses judge of their state by examining the coat; when it is smooth, and the skin is soft to the feel, and elastic, the animal is in good condition. The same criterion may be resorted to in the human subject. When the skin is of a light flesh tint, smooth, and soft, pliant and elastic, we know that its immense capillary circulation is in good order, and that its important secretions are properly performed. The latter will be increased by

exercise, but a person in good health, like a horse in good condition, should be able to use considerable exertion without much sweating. In constitutional unhealthiness the skin is pale and dingy, harsh and dry; the countenance is sallow. The blood is not effectively pushed into the capillaries of the surface, and the important excretion, by which much useless and noxious matter is got rid of, is diminished or suspended. By a strange inconsistency, persons who incur considerable trouble and expense in insuring daily attention to the skin of their horses, very often take little or no care of their own. The state of an organ so important cannot be of less consequence in the one case than in the other. Considering that the condition of this organ is powerfully influenced by that of the circulation and other internal movements, while this action is reciprocal, medical men cannot fail to understand that daily care of this organ secures health and strength to those who are well; while its return, when unhealthy, to an efficient state of circulation and secretion affords important aid to the recovery and maintenance of health.

With this condition of the skin there is usually combined, in greater or less degree, decline of flesh and power. The muscles want the firmness and ready contractility of health, becoming even loose and flabby, with increasing unfitness for bodily exertion. As the mischief proceeds the nervous system becomes more and more depressed. There is lowness of spirits, irritability of temper, deficient energy of will and action. Hypochondriasis and melancholy may supervene. Nervous irritability shows itself in numerous and various forms, especially in females.

The circulation, as might be expected, varies according to the general condition; the pulse being rather full and strong at one end of the scale, small and feeble at the other. It is sometimes irregular.

When the important functions of digestion, absorption, assimilation, nutrition, and excretion are disordered, the composition of the blood must be altered. This "living and circulating flesh," as a German writer has not inaptly though somewhat poetically called it, must be vitiated by the introduction of ill-prepared supplies and the retention of matters which ought to have been eliminated. Chemistry has not yet succeeded in disclosing the exact nature and extent of these changes, though the French inquirers, particularly Andral and Gavarret, have investigated successfully the varying proportions in which the several constituents of the blood are found in various diseases. All observations prove that the proportion which the red blood corpuscles bear to the other constituents of the circulating fluid is in direct relation to the activity and vigour of animal power. Andral found the globules to be only 28·7 instead of 127 per 1000 in a case of extreme chlorosis; at the same time there was a corresponding increase of water from 790 to 868·7. The pallid state of the skin and countenance in those whose nervous system has been severely depressed by long continued constitutional unhealthiness, shows unmistakeably a deficiency in the red colouring matters of the blood. The progress of chemical science may throw further light on this interesting department of pathology.

We should understand but imperfectly the sanitary state of a patient if we omitted to inquire carefully into the nature and quantity of his food and drink, the number and times of meals, also the habits of living, in respect to exercise in the open air, and mental occupation.

Local treatment, although of secondary importance, is not to be neglected in spontaneous inflammations; such measures as the state of the part may require should be resorted to, according to the directions in preceding chapters. The in-

fluence of constitutional treatment must often be slow in cases of confirmed unhealthiness; while on the other hand, in more recent cases, where the powers of the system have not yet been seriously impaired, local ailments are quickly benefited or cured, as health improves, under the simplest local management.

Curative measures of different, and indeed opposite character, will be necessary in the several unhealthy states of constitution, comprehended under the foregoing general description, varying as they do from those allied to the state of plethora, with increased strength of circulation, and the external appearances of health and vigour, to the apparently and really debilitated condition resulting from long-continued imperfection in some of the most important functions. Between these extremes there is a large and indefinite number of intermediate gradations. There are still some common objects of treatment, such as the restoration and improvement of deficient and unhealthy excretions, although the means of accomplishment and the concomitant measures may be widely different. We might make a rough and loose twofold division of our patients. The first would include the whole middle class, and those above them, all enjoying ample means of more or less luxurious indulgence, with which love of ease and its enjoyment are not unfrequently combined. To the second might be referred all below who are less fortunately situated. Among them, however, is a mass, by no means inconsiderable, of skilled and superior workmen and mechanics, who, by earning large wages, possess the means of indulgence, which they are too commonly eager to enjoy, forgetting, like their superiors, the price which they will have ultimately to pay in damaged health for temporary pleasures. Below these come the really unfortunate members of society, who have been brought by misfortune

or improvidence into a condition of poverty and hard work, with their attendant privations, by which they have been rendered more liable to the attacks of disease, and less capable of the restorative efforts necessary for its cure. Perhaps, however, the observations on treatment might be conveniently enough considered under the three divisions: firstly, of the plethoric state with excess of power; secondly, of the intermediate gradations, which lead to the third condition, in which the want of power becomes more and more apparent.

When a spontaneous inflammation occurs in a person of full habit, the source and nature of the mischief and the remedial measures are too obvious to be mistaken. The fæcal, urinary, and cutaneous excretions, if deficient or unhealthy, must be restored or improved. Alimentary accumulations should be got rid of by suitable means, such as pills of calomel with compound extract of colocynth or jalap, followed by an aperient draught, a purging mixture, or castor oil. If the bowels should continue sluggish, a compound rhubarb pill may be taken daily or every second day, with an occasional morning dose of Seidlitz powder, if necessary. If the urine should be acid, and more particularly if it deposits lithate of ammonia, from fifteen to twenty grains of bicarbonate of potash, with six of nitre, may be taken in water or a teacupful of chamomile tea, twice a day, three hours after the breakfast and dinner meals. Due care must be taken to maintain the skin in an efficient state of circulation and excretion. The errors of diet which have occasioned or favoured the state of plethora should be avoided. Food may be taken three times daily. If considerations of health are to determine the point, the principal meal, dinner, should not be later than two or three o'clock, breakfast and the evening repast being respectively five or six hours' earlier and later, and, as a general rule, not including animal food.

A little reflection cannot fail to convince even those who are ignorant of the human frame that strength is not conferred in proportion to the quantity of strong food and drink that can be swallowed, but by that which can be duly digested and assimilated by the appropriate organs. Quantity, therefore, is a more important consideration than quality. The several meats, game, poultry, fish, well-cooked vegetables, and the lighter adjuncts of the table, all in their various modes of cookery, are sufficiently wholesome if prudently enjoyed, that is, without overloading the stomach. The rule of leaving off with an appetite, more frequently commended than followed, would be a sufficient guide as to quantity; they who observe it will surely be ready for their next meal. There is more difficulty about the drinks than the eatables; although many enjoy excellent health, drinking nothing but water with dinner, and are so convinced that the habit is most advantageous to health, that they are zealous and unceasing in their efforts, to enforce on all the practice which would indeed be useful in many of the cases now under consideration, I cannot help believing that in other instances the stomach will perform its office better with the aid of some stimulus than without. A moderate quantity of light and well-made malt liquor may be safely taken, or a little wine. The products of the French and German vineyards are safer than the stronger wines more commonly consumed in England under the firm belief that they are better suited to the English constitution, a point which is doubtful. As the intermediate degrees pass on one side into the states marked by excess of power, and in the other into those characterised by the opposite condition of weakness, they cannot be subjected to uniform rules of treatment. Some will do well under the plan sketched out for the first division, with slight modifications; while in others we must carefully avoid measures of

a weakening character, whether in medicine or diet, bearing in mind constantly the necessity of rallying the circulation, rousing and maintaining the energy of the nervous system. In proportion as these objects are secured, we may calculate confidently on improvement in the state of local complaints, and their progress to recovery.

Although the patient should be weak, it may be necessary in the first instance to employ active means to correct the secretions and restore the excretions and digestive power. As the several medicines which agree in acting on the alimentary canal, produce their effect in different ways, a combination of them is advantageous when several processes are in fault. Some stimulate the large intestine and lead to the expulsion of its contents, as aloes and colocynth, hence called eccoprotics; some, as calomel and antimony, excite secretions and cause discharge of mucus; others stimulate the intestinal linings, causing watery discharges; rhubarb, without exciting discharge, acts on the the stomach and on the canal generally with so much advantage, as to have become one of the most popular aperients. If the bowels are costive, the tongue coated, the appetite deficient, even not without feelings of nausea, pills of calomel, with colocynth or jalap, or of calomel, James's powder and aloes, or calomel alone in a four or five grain dose may be administered, and followed, if necessary, after a few hours, by a warm draught containing infusion of senna, or rhubarb, magnesia, and sulphate of potash. By unloading the alimentary canal in this way, the system is relieved, and appetite returns at least in some degree. One clearance will probably suffice, though something similar may be again needed. If the bowels continue sluggish, and the motions of bad colour, purgatives should be avoided, especially if there is much weakness, such mild aperients being employed as will aid the natural action

of the chylopoietic organs. The compound rhubarb or aloes pill of the London Pharmacopœia in the dose of five grains, immediately before a late dinner, or in the evening, will answer the purpose very well. The compound extract of colocynth, or the compound rhubarb pill, or extract of rhubarb, may be combined with blue pill or calomel; these means being discontinued or confined to occasional use in proportion as the natural functions return; one or two pills of aloes and soap in equal parts may be given every four hours, if alimentary accumulation should be suspected, and large evacuations are sometimes produced in this way.

As mercury possesses great corrective and alterative powers, acting on the skin, the kidneys, the liver, probably also on the pancreas and the secreting surface of the alimentary mucous membrane, it seems peculiarly adapted to morbid states of the system marked by defective excretion and nutrition, and its employment in proper cases seldom disappoints our expectations. We give only the milder forms of the remedy, for instance, the gray powder and blue pill, and only in small doses. We avoid it altogether in weakened constitutions, or give it only in the combinations indicated above. Under other circumstances two or three grains of either form may be given every second day, daily, or even twice a day with an occasional aperient if necessary.

When, after the intestinal canal has been cleared, the stomach is found unequal to its task, from long-continued disorder, tonics and bitters are found useful in addition to occasional mild aperients. The vegetable infusions may be combined with cordials in the shape of tinctures or with alkaline carbonates if there should be acidity. The spiritus ammoniæ aromaticus would be useful in the latter case.

Warm aperients, such as the compound decoction of aloes either with or without tincture of senna or rhubarb are well

suited to enfeebled habits where the stomach is weak. This decoction, with an equal proportion of infusion of rhubarb, represents in the fluid form the combination so extensively employed in the compound rhubarb pill.

Such articles of food may be allowed in general as patients are inclined to take, and feel that they can eat with relish, under the condition of not exceeding the quantity which the stomach can receive without uneasiness, either immediate or consequent. Care must be taken in the weaker subjects that the aliment is light, easy of digestion, and nutritious. To the question whether so-called made dishes are wholesome, an eminent physician is reported to have replied "Yes, if they are well made;" and I agree with him. By judicious culinary skill and combinations, meats that would be hard may be softened and rendered easy of digestion. We cannot expect that organs weakened by disease can digest such kinds and quantities of food as are taken with impunity by the healthy and strong. Sometimes the stomach will not receive or digest solid animal food; good broth, beef-tea, or soup, with bread, macaroni, or vermicelli may be substituted. Milk, eggs, and the various farinaceous articles, such as rice, arrow-root, sago, tapioca, in the shape of puddings, are light and nutritious. Tea and cocoa, with bread or biscuit, are generally acceptable to invalids. The aid of stimuli, such as beer, wine, and even spirits in dilution or composition, will be more required in proportion as the patients approach more nearly to the lowest class. The quantity to be allowed at first, its continuance, diminution, or withdrawal will depend on the state of circulation; should that be accelerated, with heat of skin, headache, and thirst, the allowance is too great, and should be immediately reduced or withdrawn. If the nutritious articles above mentioned can be taken in sufficient

quantity, stimuli may not be necessary and should be omitted if they excite.

The state of the skin is a point of importance in all forms and degrees of constitutional unhealthiness, and not less so to those who being well wish to attain and secure the highest vigour. It is, however, strangely neglected in all ranks, but particularly in the two most numerous classes, the middle, and those below. Claiming attention on the mere grounds of personal cleanliness, and comfort, the organ forming the external covering of our frame, must be an object of the greatest interest to the anatomist and physiologist, from its beautiful and wonderful structure, particularly the immense capillary system, the nervous supply, and the combinations it presents of almost contradictory qualities, that is, of high and delicate organization, vascular and nervous; of softness, pliability and elasticity, with great power of resistance and capability of sustaining almost extreme violence without injury. Water, either tepid or cooler, down to the temperature of the atmosphere should be used to the body generally daily, or as often as may be practicable, and effective ablution with soap should be added once a week. Warm bathing may be sufficient for those in a weak state, and it may be used by the timid as a preparation for the colder fluid. The cold shower-bath often strengthens the weak, and is useful and agreeable to the strong. After the skin has been dried it should be thoroughly rubbed with a coarse towel or rough gloves. When it is thoroughly cleansed for the first time, much extraneous matter consisting of cuticular scales, sebaceous and other secretions, not to mention dirt, is detached in larger or smaller, and sometimes in not inconsiderable rolls. Such accumulations cannot fail to interfere with the functions of the organ, by obstructing the orifices of ducts and the countless pores which open on all parts of its surface; they will soon be repro-

duced unless prevented by regular care. The attentions now recommended promote health and strength by maintaining an active condition of the cutaneous capillaries, and, by equalising this circulation over the entire surface, have the beneficial effect of preventing and removing local determinations and congestions.

In the advanced stage of unhealthiness, as seen in those ill-nourished and ill-clothed persons, who pursue laborious occupations by day, and sleep at night in crowded and unventilated apartments, we observe how seriously the powers of the system may be impaired by a combination of depressing influences often aggravated by domestic cares and anxiety. Under such circumstances local disease is easily excited and difficultly cured. The first object is to rouse and support the circulation; unless this can be accomplished, we cannot expect to see the energy of the nervous system restored, or the functions of digestion, assimilation, and nutrition brought back to their healthy state. An hospital is the best refuge for such cases; here they find warmth, cleanliness and comfort, generous diet with suitable stimuli, strengthening medicines, with the aid of the warm bath and soothing local remedies. The food with stimuli should be as nutritious and sustaining as the state of the stomach and circulation will admit. Bark and steel are the best remedies.

Female domestic servants, particularly in the middle and lower classes, although previously strong and well, often suffer much from hard work, bad hours, and imperfect rest, unwholesome food, and exposure to cold and damp. They suffer from a disease of the legs, called erythema nodosum, almost peculiar to themselves. They soon recover by rest, warmth, and good diet, with or without strengthening medicine.

CHAPTER VI.

FEVER.

The general disturbance of the vascular system, excited sympathetically by local inflammation, is called *fever; sympathetic fever*—sometimes *inflammatory fever*, or *sympathetic inflammatory fever*. The same name is given to analogous constitutional affections, not obviously originating in local affection. The latin *febris* (from which our *fever*) is from *ferveo*, to be hot; this, and the Greek terms πυρετος and πυρεξια, from πυρ, fire, denote a striking external symptom of most fevers, *i. e.* increased heat, with which increased frequency of pulse is generally combined.

These two circumstances, viz., the increased heat and increased frequency of pulse, are found in many states of the body, which in other respects, differ greatly; that is, the disturbance of the circulation, on which the accelerated pulse and increased heat depend, may be accompanied with various kinds and degrees of disturbance in various parts. Hence it has not been found practicable to form any definition, or even short description of fever, that should comprehend the nature and cause of all the affections included under that word. It is indeed useless to make the attempt; for the cases vary almost infinitely; the term has been, and is employed loosely; and moreover, the seat and nature of the

disease are still controverted points, even in fevers of common occurrence.

Fever, taken in its original and etymological, as well as in its more obvious and common sense, as denoting the excited pulse and augmented heat, especially the latter, is the name of a symptom rather than of a disease; and it is thus employed by Hippocrates, and other ancient writers, who enumerate πυρετος or fever among the symptoms of certain local inflammations.

Regarding fever in this point of view, we might define it a general disturbance of the vascular system, caused sympathetically by irritation, inflammation, or disorder of some organ or parts.

This, I believe, would be a sufficient definition of surgical fevers. It must, however, be observed that, if we take *fever* in the medical sense, and understand it to embrace, not only the cases, in which accelerated pulse and heat are present, but also others more or less closely allied to these, we shall perhaps find some cases, at all events we shall meet with some stages of many cases, in which these symptoms are not present.

It is doubtful, however, whether we can properly call any case *fever,* in which vascular excitement and heat are not present at some period.

When an important organ is inflamed; or, when inflammation of serious degree and extent affects a part of less importance, the vascular excitement and heat are conjoined with symptoms belonging to the part, and the name sometimes expresses both circumstances. Hence the medical terms *catarrhal, erysipelatous, bilious, gastric, rheumatic* fevers; and the common phrases *rheumatic* fever, *brain* fever, *milk* fever. These are not bad names; they denote the two circumstances which deserve our attention, viz., the local

cause, and the more general disturbance, and they mark the dependence of the latter on the former. In professional language, we name the disease from the local affection, when we know that, regarding the fever merely as a symptom. *Phrenitis, encephalitis, pleuritis, enteritis, peritonitis* are such names. If we do not know the local origin, we call the case *fever*, thus naming it from the most prominent symptom, as in other cases where the exact seat of disease is not ascertained.

When we do not discover the local cause; or if, as some pathologists do, we regard fever, in a large proportion of cases, as a general disturbance independent of such local cause, it is called *idiopathic*, that term implying that the fever, as a general disturbance, is immediately produced by the exciting cause. The French apply to these cases the name of essential fever, *Fièvre essentielle* *, considering the fever or general disturbance to be the *essence* of the complaint. The other cases, in which fever is a symptom of obvious local affection, are *sympathetic* or *symptomatic*. The propriety of this distinction in a scientific point of view is doubtful: the very existence of *idiopathic* or *essential* fever in the strict sense is questionable. I am aware that the nature of the disturbance and the treatment are very different in the two kinds of cases, and that the distinction may be conveniently retained for practical purposes, although we cannot regard it as scientifically correct.

The nature of fever is quite clear in many cases. When an important local disease takes place, such as an inflammation of the brain or its membranes, of the lungs, pleura, or pericardium, of the peritoneum, liver, stomach, or bowels, of a large joint or joints, of a considerable extent of skin; other parts, especially the vascular system sympathise with the

* 'Febres *essentiales* and *symptomaticæ*;' J. P. Frank, Introd., p. xxviii.

local mischief; and these effects constitute fever. Here there is no difficulty in seeing the local cause, and in tracing the dependence of the general symptoms on that cause.

In other instances the local cause is not so clear; the general symptoms are more prominent, and obscure it. Unless the case be carefully investigated, the primary local disorder may escape notice. All disorders of the brain that may produce febrile disturbance are not characterised by strongly marked local symptoms; and the same remark holds good of disorders in the alimentary canal.

There are cases in which we can observe no local affection during life; but examination after death unexpectedly discloses local disorder, occasionally serious. Thus, in a case of fever, of which the cause could not be traced during life, Dr. Tweedie found, after death, an abscess in the spleen.

Here let me remark that, in speaking of local *inflammation* as the cause of fever, the word is used in a general sense, to denote not merely the state of a part in which there are swelling, redness, heat and pain, but also the minor degrees of disturbance marked by simple afflux of blood, vascular congestion, or functional derangement.

Thus we find that, in the great majority of cases, there is a local cause of fever; if we cannot trace such a cause in some instances, what are we to infer? That such cases are an exception to the general law, or that we do not yet sufficiently understand them, and ought to mark them down as subjects for closer investigation;

Idiopathic fever, however, belongs to the medical department of instruction; the causes, nature, and treatment of the cases referred to that head are considered in the writings of physicians and in medical courses. I will only observe that between the febrile diseases treated by the surgeon and those which fall to the lot of the physician there is, in many

cases, no essential difference of nature or treatment. We frequently see as a disturbance symptomatic of local disease a kind of fever, which, if it were contemplated without a knowledge of the local cause, would be called typhus. You must therefore omit no opportunity of gaining information on this subject from the lectures and writings of physicians.

The sympathetic or symptomatic fever which attends surgical diseases is not a uniform affection in all cases; it exhibits varieties of character dependent on the temperament, constitution, state of health, diet, and other habits, and on the age of the patient, on climate and season.

1. Sympathetic fever may be inflammatory. The disorder of the vascular system being primary, and the most strongly marked. There is a full, strong, and hard pulse, considerable heat of body. This indeed is the constitutional disturbance already described as attending acute local inflammation; it is the *synocha* of Cullen. Synocha merely means—continued, from the Greek συνεχης; πυρετος συνεχης is used by Hippocrates.

The means employed in the treatment of local inflammation are equally efficacious in removing the concomitant sympathetic disturbances. The existence of considerable inflammatory fever may render more active treatment, especially as regards abstraction of blood, necessary.

2. The disturbance of the digestive organs may predominate; and such cases constitute what are sometimes called gastric or bilious fevers.

Serious local injury often primarily disturbs the alimentary canal, producing tenderness and pain in the epigastric region, diminished appetite or sickness, thirst, costiveness; and these symptoms, to which acceleration of pulse, and heat of skin are soon added, constitute traumatic fever.

The principal symptoms of gastric or bilious fever, under

which term *mucous fever* must also be included, are referable to disorder of the alimentary canal; they are uneasiness, either mere tenderness on pressure, or pain more or less severe in the region of the stomach; thirst; complete loss of appetite; nausea and sickness; pain on taking anything into the stomach, with speedy rejection; tongue, coated and foul, or coated, with red edge and tip; costiveness; sallowness of countenance.

The symptoms show clearly that the origin of the mischief in these cases is an impression produced on the stomach by the local injury or disease. Sometimes the pain in the region of the stomach, and the functional disturbance of the organ are so considerable, that we cannot but regard the case as inflammation of the mucous lining, or gastritis.

Viewing the obvious disturbance in the digestive organs, some writers have taught that we should employ medicines calculated to remove this; and that we need not and ought not to take blood. They are of opinion that where the bilious character is well-marked, bleeding is not only unnecessary, but prejudicial; and that such cases should be treated by purgatives, calomel more particularly.

Broussais on the contrary proscribes purgatives; he considers their exhibition in any case, where inflammation of the gastric or intestinal mucous membrane exists, as most injurious. He exhausts the vocabulary of abuse against all those who purge their patients under such circumstances, denominating it an incendiary treatment, murderous practice.

He believes that purgatives irritate and inflame the mucous membrane of the stomach and intestines, and thus aggravate the original mischief; and he does not hesitate to ascribe to their employment the ulceration of the mucous membrane so frequently seen in the intestines of those who have perished from continued fever. He says that the treat-

ment should consist in allaying inflammation by loss of blood, and in preventing irritation of the inflamed surfaces by confining the patient to some mild mucilaginous drink. He considers the abstraction of blood locally to be the most advantageous, and employs leeches to the abdomen in large numbers, often some dozens. He confines the patient to gum water, eau gommée *.

I cannot agree with either of these views. The loss of blood will often relieve the gastric disturbance more speedily, effectually, and agreeably than purgatives. Under suitable circumstances of age, strength, state of circulation, especially with a serious local affection, I should not scruple to employ venesection, although the case should be denominated bilious. When the tenderness of the epigastric region is great, with tormenting thirst, and rejection of everything taken into the stomach, free leeching may be used instead of venesection or after it.

We may agree with Broussais in condemning the use of purgatives as a first or only remedy in the acute affections, to which the names of gastritis or enteritis could with any propriety be applied. Indeed, when the stomach immediately rejects what is swallowed, internal remedies cannot do much good. But we cannot go further with him, and be contented, after taking blood, with the administration of gum water. Purgatives are of the greatest use in clearing away alimentary

* Cura febris biliosæ et saburralis.—"Sed primum est ut complicatio, si quæ subsit inflammatoria attentius eruatur: pessimasque sequelas fatalis de putrido mox sanguine opinio habuit: quæ medentium oculos circa cruorris demendi necessitatem hypothetico velo obduxit. Perniciosa quidem in quavis certe gastrica, venesectio observatur, quotiescunque vera hanc instituendi desideratur indicatio; sed hoc ipso, quo de his loquimur, sub cælo, licet calidiori, non tam infrequens est gastricæ cum inflammatoria dispositione combinatio; et neglectam sub initio venæsectionem irrevocabile ægrotantibus damnum inferri, experientia convicti fatemur." (I. P. Frank, i, 166.)

accumulations and morbid secretions; and the free discharges they produce relieve the vascular system and thus dispense with the necessity of further loss of blood.

The notion that purgatives cause inflammation or ulceration of the intestines is totally unfounded. I never saw a case in which such a thing could be even suspected. In a case of fever terminating fatally at the end of a fortnight, where purgatives, especially calomel, had been freely administered throughout, the mucous membrane was healthy in its whole tract. I would observe here, that ulcerations of the intestinal mucous membrane are common in France, where purgatives are seldom used; more rare here, where these medicines are seldom omitted. The stomach is sometimes so irritable that it rejects aperients or anything else, seldom, however, after proper depletion. So much benefit always ensues from unloading the alimentary canal, that we must attempt it by such medicines as are active in small compass by calomel alone, in repeated doses, or combined with extr. coloc. comp.; perhaps croton oil. The senna mixture, or saline purgatives in the effervescing state may be useful. Blisters or sinapisms may be applied to the stomach, which will probably bear diluting drinks, cold, in small quantities.

3. In a third form of sympathetic fever, the head is principally affected, and the symptoms, referable to disorder of the sensorium, resemble those of the nervous fever or typhus as it is generally, but rather loosely denominated. There is uneasiness about the head, heat and flushing, dulness and stupor with heaviness of the eyes, oppression of the countenance, impaired state of the external senses or mental faculties. Muscular power is seriously diminished, with great sense of weakness; debility, hence the name of adynamic fever. The disturbance in the sensorial and moving

powers has been marked by the French term ataxique, which means irregular. The oppression of the central organs of the nervous system disturbs the digestive organs, the secretions, and the circulation. When such a febrile attack has lasted for some time, especially if proper means have not been employed to check its progress, the symptoms become serious, and the patient is in an alarming and dangerous state. The oppression of the nervous system, with low delirium, or stupor and coma, the complete prostration of strength, the involuntary tremors and starting of the tendons, the disturbance of the digestive organs indicated by a dry, brown, and glazed or fissured tongue, with sordes about the teeth and lips, present a formidable collection of symptoms, called typhoid, the danger of which is marked by the terms applied to this form of complaint of malignant or putrid fever. This aggravated typhoid disorder is hardly seen, except in idiopathic cases. Surgical or sympathetic fevers only approach to it.

In the beginning of the disease, with clear evidences of congestion in the head, when the state of debility has not yet come on, and with a view to prevent it, as well as the typhoid state generally, local depletion by leeching or cupping may be advisable. The local application of cold is advantageous. The head should be shaved, and covered with cloths dipped in cold water, evaporating lotions, iced water, or ice in a bladder. The cold douche may be useful; after its employment the heat is lessened, the patient often sleeps and sweats.

Calomel, with antimony and mild purgatives are the best remedies in the early stage.

When the brain and the circulation are relieved it will be necessary to give nourishment and stimulants with caution. The muscular debility, which is seen in the earlier stages, is not an evidence of simple weakness, but results from that

oppressed state of the brain which diminishes voluntary power. This has sometimes led to the injudicious use of tonics and stimuli. Bark and wine will not remove the sensorial congestion, from which the want of muscular power proceeds. When, however, the complaint is protracted, and the power of the system failing, with small and weak pulse, tonics and cordials with wine must be resorted to, their effect being carefully watched. This treatment is employed for a temporary purpose, to rouse the flagging powers: when the patient rallies, it may be proper to lessen or withdraw the stimulus. The patient is not to go on continuously with wine or brandy, without careful attention being paid to the state of the circulation.

Under the name of *irritative fever*, a state has been described which is not essentially distinguished from this nervous or typhoid kind of sympathetic fever. We see this in a serious injury, such as a compound fracture which goes on badly, which is in fact incurable, where the powers of the system have been exhausted by extensive and continued inflammation and suppuration, while the local irritation still proceeds, and the febrile disturbance is still kept up. Thus it is high action in a weakened frame, where the powers of recovery, both local and general, are failing.

Fever excited by local injury or disease may be intermittent: you may have a regular paroxysm of ague.

CHAPTER VII.

SUPPURATION.

Suppuration.—The formation of *pus* or *matter* is an effect of inflammation; the process is called *suppuration.*

Pus in its more ordinary forms is a whitish or yellowish fluid, varying in consistence from that of water to the thickest cream, and found, when examined microscopically, to consist of globules floating in a fluid, thus presenting an analogy to the constitution of the blood. It varies not only in consistence, but in colour, tenacity, odour, and other properties, these varieties depending chiefly on the nature and degree of the inflammation which produces it, and on the structure of the part, in which it is formed.*

The collection of pus or matter in the substance of an in-

* It is neither acid nor alkaline, and of specific gravity 1·021 to 1·040. The serum contains albumen in all respect identical with that of the blood. The pus-cells are transparent when immature, but become yellow from deposit of fatty matter.

Rokitansky considered that pus was formed out of the exuded plasma of the blood, but Virchow pronounces it the produce of rapid cell-growth set up in the parenchyma itself. Either opinion finds its supporters; although no modern pathologist regards pus as degenerated lymph. "The white corpuscles of the blood, the lymph corpuscles of the chyle, and pus-corpuscles are identical and indistinguishable. They differ in their mode of origin. The two former are generated within a vascular system, normally; pus is generated externally to a vascular system, abnormally." (Article "Abscess," Holmes' 'Surgery.')

flamed part constitutes an *abscess* (from *abcedere*, to depart. (*Celsus.*)

The formation of matter is not confined to the circumstances now alluded to; it may take place in other and different cases.

1. On the denuded surface of inflamed cutis, as after scald or blister.

2. On the surface of inflamed mucous membrane; that is, a fluid, with all the sensible characters of pus, not distinguishable from it by appearance, is exhaled from such membranes when inflammation has reached a certain extent.

3 and 4. On the surfaces of inflamed serous and synovial membranes.

5 and 6. On the surface of wounds, when they are repaired by granulation, and on that of ulcers.

The term *abscess* is applied only to collections of pus, excepting however those which take place in the regular or normal cavities, such as those of the pleura or peritoneum; when pus or any other fluid is poured out into these, we call it an *effusion*.

Seeing suppuration ordinarily as a result of inflammation, we are led to inquire whether it is so invariably. Whether, when we find pus, we may be sure that there either is, or has been inflammation of the part.

In the abscess of acute inflammation, in the formation of pus by mucous, serous, and synovial membranes, and by denuded cutis, the point is unequivocal, the pus is the produce of inflammatory disturbance. The case is different with the granulations of wounds and ulcers, which are healing; those granulations are not inflamed, though they present increased vascular activity, a condition analogous to that of inflammation. In certain abscesses, as I shall explain hereafter, we fail to observe any symptoms of previous or

accompanying inflammation, yet we find, on examining the surrounding structures, unequivocal evidence of preceding inflammatory disturbance.

Again, we do not hesitate to pronounce that inflammation has existed, when we see such structural alterations as are the well-known results of that process, although the disturbance itself has escaped our notice. In the same way as pus is not a normal product, we may conclude from its presence that there has been an alteration in the vessels or their contents, which may be discovered by closer observation, or more careful examination of the parts in which it is found.

I have already shown you that inflammation varies greatly in the violence of its symptoms, and the rapidity of its progress. Suppuration exhibits, in this respect, the same variety of character as the inflammation which causes it. Pus may be formed, an abscess completely developed, and break externally, in a short time, two or three days, or less; or the collection may form slowly, and the matter remain in the part for weeks, months, or even years. Suppuration, therefore, might be distinguished, like inflammation, by the terms acute and chronic. We use the expression chronic abscess though we do not speak of acute abscess. More generally we denominate those collections of fluid which are produced by the most violent inflammation as phlegmonous abscesses, of which it is my present purpose to consider the nature, progress, and treatment.

Inflammation having proceeded to a high degree, pus or matter is formed in the centre of the inflamed part. The affected tissues are softened, the cohesion of their constituent parts is lessened, and this change proceeds so far in the centre of the inflamed point, *i. e.*, where the disturbed action of the vessels is at its highest degree, that they are actually broken down, and a thin, serous effusion, of reddish colour, is

mixed with the disorganized tissue. This breaking down of tissues, and the bloody effusion, are not mechanical, but vital processes.

White matter or pus is now seen disseminated in small portions, which soon unite into one collection, an abscess. The fluid increases in quantity; the collection, as it increases, pushing aside and condensing the surrounding cellular tissue and other soft parts, which yield more or less readily according to their nature. The cellular texture gives way easily; the firmer parts, such as muscles, tendons, blood-vessels, resist, forming elevations or ridges on the sides of the abscess, and sometimes pass across from one side to the other, being insulated by the matter. When the surrounding parts yield equally, the form of the collection is regular and rounded; under other circumstances, the figure is various.

The surface of the cavity is soft and pulpy, greyish or yellowish, being coloured by the matter which adheres to it. With the handle or back of a scalpel we can scrape off a soft, greyish substance, considered to be fibrine. This is inorganic, at least it does not receive injection. When it is removed, we see a dense, compact, reddish structure which has been compared to a mucous membrane. This kind of newly-formed membranous texture constitutes a bag containing the matter; it may be dissected entire from the surrounding parts, when the abscess would be a bag or cyst full of matter. This texture, recently called the pyogenic membrane, forms, in technical language, the parietes, walls, or sides of an abscess.

Its internal smooth surface, which shows considerable vascularity on injection, is in contact with the contained matter. To the external surface the surrounding cellular membrane, and other parts are closely adherent, being condensed and rendered preternaturally firm by the inflammatory process. This condensation extends to a greater or less distance around

the abscess, beyond which we find the parts in their natural condition. In the early stage of an abscess the collection of matter is small, and it is surrounded by a large mass of firm substance; in the progress of suppuration the quantity of matter increases, and the surrounding hardness diminishes.

The sac of the abscess consists of the cellular substance or other soft parts condensed by the effusion of fibrine, and forming a barrier between the matter and the surrounding healthy tissues. It insulates the pus, and confines it to the part in which it is deposited; otherwise it would spread along the cellular tissue generally, as the fluid of anasarca does. The inflammation is most violent in the centre, and there produces suppuration; it is less violent in the circumference, causing merely interstitial effusion, and consequent condensation.

These different effects represent what Mr. Hunter has denominated adhesive and suppurative inflammations, which terms designate here, as in most other cases, merely difference in degree, not in the nature of the disturbance. At a greater distance from the suppurative centre the increased action is still further lessened, and causes merely serous effusion.

The pus contained in such an abscess is a thick, whitish or yellowish, homogeneous, soft fluid; it is as thick as the thickest cream, and sometimes even more so, having the consistence of a soft solid, like butter. Such matter has been called good or laudable pus, pus laudabile. This expression, singularly but not inappropriately denotes the kind of purulent effusions produced by high inflammation in a healthy individual. Generally speaking, the higher the inflammation, the thicker the matter produced by it.

Pus is heavier than water, and sinks in it. This has been

regarded as a criterion to distinguish it from mucus. Great pains have been taken to establish the distinction, particularly in reference to expectorations, but diagnosis is not always successful. Under ordinary circumstances, there is no risk of confounding the two fluids. Pus has no viscidity, and easily blends with water. Mucus is ropy, slimy, and not miscible with water. While pus sinks, mucus floats; but this is not constant; the tough mucus from the inflamed bladder sinks, even in the urine. The ordinary, or even the slightly altered secretion of mucous membranes is not likely to be confounded with the produce of suppurative inflammation. But under high inflammation mucous membranes secrete a fluid closely resembling pus; and I know of no certain distinction. It is not a point of any material practical importance.

Pus is secreted or effused through the pulpy surface of the abscess; it is a morbid product from vessels disturbed by inflammatory excitement, as ordinary secretions and nutritive deposits are the regular offspring of vessels in their normal state. It is not produced by fermentation or concoction of the fluids; nor does it result from a breaking down or melting of the solids. The latter notion has probably arisen from observing the cavity which contains the matter. There is a large excavation, an apparent loss of substance; the notion might well arise that parts had disappeared and had been converted into pus. There is really no loss of substance. The textures surrounding the matter are merely pushed aside and swelled; the natural form and bulk of the part are restored when the disease has come to an end.

Yet there is something like a breaking down of the natural textures in the commencement of phlegmonous abscess. There is not only a softened state of the parts, but actual

solution of continuity, with a bloody effusion. Oil from the adipous membrane is sometimes mixed with the pus. In a patient who had laboured under fever, and who came to St. Bartholomew's Hospital from the Fever Hospital, there was a large abscess on the hip; the contents were pus and oil, the latter floating on the surface of the former. The opening became obstructed before the sac was emptied, and I drew out a lump of the common adipous matter twice as large as the last joint of my thumb.

In the matter discharged from a mammary abscess in a suckling woman it is not uncommon to see milk clearly recognisable, and sometimes partially curdled or creamy. Portions of hepatic substance are seen in the pus discharged from an abscess of the liver, which may also have a brownish red tinge.

The fluid of an abscess has been supposed to undergo changes before it acquires the full characters of pus. Matter is said to be well elaborated or concocted. The older writers speak of the maturation or ripening of an abscess. We find, on the contrary, that pus is formed at once, with its full characters. Indeed, the fluid seen at the very beginning is serous, thin, with bloody tinge; but pus soon shows itself and is perfect in its characters. In the same way denuded skin first secretes a transparent serum, then pus; and there is a gradual transition from the natural colourless fluid of mucous membranes to the secretion not distinguishable from pus. But, in all these cases, when the purulent secretion is established, the pus is formed at once with its full properties. Thus the cyst of an abscess is a kind of newly formed organ in the animal economy, a new organ for a new product. It secretes and it absorbs. Hence, if the inflammation be brought to an end, the matter may be taken up by the absorbents, and thus a spontaneous cure may be effected.

Symptoms.—A violent inflammation, proceeding rapidly, accompanied by throbbing pain, especially if left to itself, is likely to cause suppuration. The actual formation of matter is accompanied by diminution or complete remission of pain, except where inflammatory tension is maintained by the unyielding nature of the parts affected or of those containing and surrounding it; also by diminution or cessation of the febrile disturbance.

Both the local and general symptoms may, however, be aggravated when suppuration occurs in parts of dense and resisting organization, especially when they are covered and connected with highly organised and sensitive structures as under periosteum, in the digital thecæ, in the palm, or sole.

There is often a sense of weight and tension, with pulsation synchronous with the heart's action. Frequently suppuration is preceded and accompanied by shiverings or rigors; these do not constantly attend. Matter may form without rigors, and the latter frequently occur without suppuration: they commonly attend the outbreak of serious spontaneous disease.

The most unequivocal evidence that matter has formed is the sensation of softness which its presence occasions. On feeling the part, you are sensible that a fluid is there. If you place the fingers of the two hands on the part, at a distance from each other, and press alternately, the fluid is forced from one side to the other, the sensation thus received being called fluctuation.

Careful examination is necessary, in order to determine whether matter has formed or not, especially when the inflammation has been deep-seated. Instead of keeping up an alternate pressure with the two hands, by which an impulse is sometimes produced where matter has not formed, let one hand rest on the part, then press firmly and quickly

with the other. Frequently, direct examination will not enable us to determine the point: we must combine with careful examination of the part a consideration of the other symptoms.

Progress to the surface.—When suppuration has begun, the abscess becomes larger and larger, increasing in all directions, but extending principally where the resistance is least. Generally, therefore, it enlarges towards the external surface, or towards that of any mucous canal. This progress of an abscess, however, towards the exterior, or towards the natural mucous outlets, does not depend simply on the circumstance of there being less resistance in those directions; for abscesses will take either of these courses, although there should be less opposition in other quarters. Thus abscesses in the abdominal or thoracic parieties, or in the pelvis, make their way outwards; and those forming deep in a part, equally tend to the surface, so as to bring about a discharge of their contents externally.

There is gradual removal of the intervening parts, and approach of the matter to the surface, it being still walled in by adhesive inflammation as the removal proceeds. Thus deposition and removal, opposite processes, are going on together in different portions of the same swelling; the latter on the exterior, to bring the matter to the surface, the former, of pus and lymph, in the cavity and wall of the abscess.

As the fluid advances to the exterior, the coverings become thinner and thinner, and the fluctuation is more and more distinct. The inflammatory swelling of the surrounding parts is lessened; but the central portion, where the sense of fluctuation is most plain, continues to enlarge, and rises into a prominence more or less pointed: this is the pointing of an abscess. The skin becomes red, tense, and shining; it is

very thin, the redness being of a deep and sometimes livid tint. The thinned skin ulcerates, and matter escapes; there is resistance and consequent separation of the cuticle, sometimes to a considerable extent, where it is thick, as in the hand and foot.

At first a small quantity only escapes, for the opening is in general a small one; but as much pus is discharged as suffices to remove tension, and the patient is considerably relieved. The sides of the abscess contract in consequence of this diminution of the quantity of its contents; pus still flows out; the opening becomes larger, and ultimately allows the whole to drain away. By means of this process, the cavity of the sac becomes much lessened; ultimately it granulates, the surrounding swelling subsides, and the opening cicatrises.

The skin, being distended and deprived of its vascular supply, sometimes sloughs; and the matter escapes as the slough separates.

The openings thus made by nature are generally small, and allow partial escape of the matter, with diminution of tension and relief. Sometimes the aperture is larger, and the entire contents are evacuated at once; the cavity contracts in proportion to the diminution of its contents; pus is still secreted, and drains out slowly. The sides of the abscess, reduced in extent by gradual contraction, ultimately collapse and coalesce, completely effacing the excavation; and the aperture is closed by granulation and cicatrisation. Sometimes, especially in parts which move considerably in executing their functions, the cavity of the abscess does not completely close. It is reduced in size; but an opening remains from which matter is discharged; this leads into a small tube, of various extent in different instances, sometimes branching out. This small tube, the remains of the abscess,

lined by a smooth pyogenic membrane, and the natural opening, constitute a fistula or sinus. The former term merely means a tube or pipe. The opening sometimes closes for a time, and the discharge is renewed after a longer or shorter interval.

Treatment.—The local treatment of a simple phlegmonous abscess, when suppuration has occurred or is imminent, is of the simplest character. The part, kept at rest, should be covered with a soft poultice, that of linseed being generally found the most comfortable, or by water dressing. Warm fomentation from time to time often affords temporary relief. The disease thus pursues its course, with little inconvenience, to its natural termination by discharge of the matter through a spontaneous opening, the poultice being continued for a short time, and then replaced by a light dressing.

Sometimes, in an extensive and violent inflammation, such as that of the hand and forearm, from injury of a finger, there may be suppuration at one part requiring relief, while dangerous inflammation is spreading in another. The means calculated to lessen the amount and extent of the general inflammatory disturbance may be continued after attending to the partial suppuration.

Since the cyst of an abscess absorbs as well as secretes, you might conclude that if inflammation could be completely subdued, the matter might be taken up by the absorbents, and thus that the abscess might be cured without the discharge of its contents externally. This sometimes happens, but so rarely, that in practice we consider an external discharge, by puncture or bursting, a necessary consequence of suppuration.

The cases in which I have most frequently seen dispersion of matter by absorption have been suppurations of the inguinal glands from primary venereal sores, and those of the

periosteum, particularly of the cranium, from syphilis. A girl of the town came into St. Bartholomew's with a sore on the labium as large as a sixpence, and a suppurated bubo. The skin over the latter was bright red and thin, the swelling was soft and seemed to contain at least an ounce of matter. I thought it fit for opening, but left it alone, prescribing blue pill night and morning, a black wash to the sore, and rest in bed, with poultice. On the next visit, the swelling was easier. Soon after, the size and redness of the part had obviously diminished, the skin became wrinkled, and in a short time all vestige of the mischief had disappeared.

It is often advantageous to evacuate the matter surgically, instead of waiting for its discharge by a natural opening. There have been different modes of accomplishing the object; for instance by seton, a needle of suitable length, armed with a few threads of silk, being entered at one end, carried through the collection, and brought out at the other end, leaving the silk in the abscess as in an ordinary seton, in the expectation apparently that the matter would drain out at the openings. Such a proceeding could not fail to renew and aggravate the local excitement of a phlegmonous abscess, and thus add to the sufferings of the patient. I once saw a case in which this proceeding had been resorted to. It was a collection of matter in the neck of a young lady. The effect was to increase the swelling, which had been quiet and painless, and to bring on active inflammation, with constitutional disturbance. In the method by caustic, the thinned skin of the groin, which may have been extensively detached from the subjacent parts, may be rubbed with the potassa fusa so as to destroy its vitality. The matter will be discharged when the eschar separates; or the latter may be cut through, so as to evacuate the collection. Under such circumstances there may be an advantage in getting rid of the

thinned and livid integument, which may impede the progress of granulation and cicatrisation. But this inconvenience does not occur when suppurating buboes are opened at a proper time and in a proper manner. If the seton and caustic have not become completely obsolete, the occasions for their employment must be of the rarest occurrence. Generally we adopt the direct and simple proceeding of puncture, which is the shortest and most effectual means of accomplishing the purpose. Knives of various forms may be used: but perhaps the most convenient instrument is a straight, lancet-pointed, and double-edged bistoury. The sharp point and double edge make it enter easily. You may make a simple puncture, or, having punctured, run the knife along, so as to extend the opening, when a more ample aperture is needed, as is the case when the skin has become thin, and the collection is large.

It is best to make the opening, and then let the matter drain out of itself. There is no advantage in squeezing out the whole contents. This is contrary to the course of nature; in spontaneous bursting the aperture is small, and the escape generally gradual; the cyst contracts in proportion as the contents are lessened. Pressure or violence are not only not necessary for discharging the matter, but they give pain and irritate. Still less should you thrust your finger into the abscess, as I have seen done, or introduce instruments of any kind without necessity. Having made the opening, let the matter run out. Cover the part with a fomentation-cloth for half an hour, and then put on a poultice.

Since many practitioners are in the habit of puncturing as soon as they find that matter has formed, seeming to regard it as a surgical duty to do so, it is necessary to consider the question generally, which of the two proceedings, namely leaving an abscess to its natural course, or dis-

charging the matter by puncture—leads to the most favorable termination of the disease. The formation of pus in phlegmonous inflammation, its most frequent effect, relieves or terminates the local disturbance; as the matter advances to the surface, the inflammatory swelling and induration of surrounding structures lessen and disappear, and the ulceration of the thinned skin completes a series of salutary processes, by which the sides of the collection are brought into the most favorable state for contracting and coalescing so as to obliterate the cavity. An early opening not only interrupts the natural process of cure, but often excites fresh inflammation. The sides of the puncture made in parts of some thickness will unite by adhesion if left in contact, while, if distended by lint, they become irritated and painful, the ultimate result being a protracted and less favorable cure. These dangers may be avoided by delaying the puncture till the skin has become red and thin, that is, nearly in the state to which it is brought previously to natural bursting.

Suppuration, however, occurs in such a variety of structures and situations, that we cannot establish any single rule for its surgical treatment. It is often expedient, or even necessary, to resort to a more or less early puncture, in order to lessen the amount or limit the extent of the mischief.

When, then, may abscesses be left to their natural course? and what are the cases in which the matter ought to be discharged by an artificial opening?

They may be left to themselves when seated superficially, and in parts of little consequence, and particularly when, instead of spreading in the circumference, the collection is advancing favorably to the surface. The following heads will comprise nearly all the cases in which surgical interference is necessary.

1. Where matter forms deeply, and when, consequently, its

progress to the surface is opposed by muscles, tendons, or fasciæ; *e.g.* deep suppuration in the forearm, thigh, or leg, more especially in the palm and sole.

It is a general law that matter advances towards the exterior; but when it encounters unyielding parts, such as fibrous textures, its advance is opposed and retarded; hence it extends in other directions, between muscles, in the course of tendons, under fasciæ, making the mischief more extensive.

In the palm and sole there is not only dense fascia, but the integuments are thick, and the subcutaneous tissue very compact. Thus matter cannot find its way outwards, but extends among the tendons and nerves, and, in the upper extremity passing under the annular ligament, finds an easy passage into the forearm. In all these cases open as early as possible. You must often puncture when you cannot feel fluctuation, guided by the local symptoms to the situation of the matter.

The same reasoning applies still more strongly to the case of matter formed on the surface of bone, as in necrosis. If not speedily discharged, it may be expected to detach the periosteum more and more extensively.

2. When suppuration has occurred in parts abounding with cellular and adipous substance, where, consequently, the collection extends readily in the circumference, for example, in the neighbourhood of the anus and in the perinæum. Here too the opening should be ample, and the edges should be kept apart by the interposition of dressing, to prevent the formation of fistula.

This rule is particularly applicable where copious cellular membrane is covered externally by muscles or fasciæ, which will impede the advance of the pus to the surface, as in suppurations in the neighbourhood of the male urethra, whether

in the perinæum or scrotum, in the ham and groin, the axilla and the neck.

Deep-seated suppuration is frequently met with on the inner surface of the lower jaw, under or behind the bone, and in the course of the neck, the matter being formed in the abundant areolar tissue, which favours the movements almost constantly going on in the important organs occupying these situations. There is much of this tissue about the pharynx and larynx, the œsophagus and trachea, and it extends in the course of the large vessels and nerves into the chest. Matter formed in these situations, being confined by the cervical fascia, the sterno-mastoid muscle and the platysma, and thus impeded in its progress outwards, presses on the organs above mentioned, and easily extends in the loose tissue around them, in which important blood-vessels and nerves abound. These circumstances render the local suffering and the constitutional disturbance intense and alarming. I have seen a case of this kind in which there had been delirium for successive nights. As evacuation of the matter gives immediate and complete relief, it should be resorted to as early as possible, that is, as soon as its presence can be ascertained by direct examination, or strongly presumed, from the history and present symptoms. As it may be necessary to puncture rather deeply, the position of important blood-vessels must be carefully considered before the instrument is used, and it will be better to wait than to run the risk of serious bleeding.

3. Suppurations in parts of dense and unyielding texture, such as the theca of a digital tendon, and in those which are not only dense, but copiously supplied with blood-vessels and nerves, for the inflammation of such parts is attended with severe suffering. This applies to all suppurations in and about the fingers, and most of those in the hand. They are accompanied with intense pain and fever, from which it is

a great object to relieve the patient. The matter does not advance to the surface; it may extend along the tendons of the fingers to the palm and back of the hand, and do great mischief. We must open, although not certain that matter may have formed, and open freely. It is of no consequence if pus should not be evacuated, as the puncture will bleed freely and thus give relief.

4. Suppurations interfering with parts essential to life, or exercising important functions, such as the larynx, pharynx, œsophagus, and the throat generally.

5. Abscesses in the neighbourhood of serous cavities, or large joints. In the former case, matter may make its way into the cavity, although it is generally discharged externally.

6. Suppurations caused by the introduction into the cellular membrane of irritating matters, such as urine or fæces. Here the freest incisions are necessary to limit the mischief, which would otherwise extend indefinitely.

7. To prevent the deformity consequent on extensive suppuration in the eyelids and other parts of the face.

In following up the rule now laid down, of adopting early puncture in many abscesses, we must often make the attempt in doubtful cases, where there is no decided fluctuation. The quantity of matter may be so small, in addition to its being deeply seated, that fluctuation is not to be expected. Here you must consider the origin and progress of the complaint, and the present symptoms, especially the state of the part in respect to swelling, redness, heat, and pain. Serous infiltration of the surrounding textures sometimes helps our judgment by affording an indication of suppuration.

In such doubtful cases of deep-seated suppuration it is necessary to puncture deeply; and you must therefore take care to avoid blood-vessels or other important parts; this precaution is especially necessary in the neck. The opening

should be as large as you can make with safety, and, as the puncture or incision is carried through parts nearly healthy, which would unite by adhesion if brought into contact, this must be prevented by interposing between them a slip of dressing.

When the natural course of proceeding is thus anticipated by art, the inflammation does not subside, as it does after spontaneous bursting; sometimes it is rather increased. The means necessary to lessen inflammation must therefore be continued, and may require to be employed actively.

The matter contained in an abscess, being completely shut out from external influences, undergoes no change so long as the collection is entire. It may remain weeks, months, or longer without exhibiting any of the spontaneous alterations, which exposure to the air would produce. When let out, the pus has merely a faint kind of odour. Sometimes, however, the matter is found to have undergone putrefactive decomposition; it is dark-coloured, brownish or blackish, discoloured throughout, or streaked, and containing bubbles of air, being at the same time extremely fetid. Sometimes there is a mixture of blood with this offensive matter, discolouring it generally, or in streaks, or there may be coagula. Sometimes the pus is natural in colour and consistence, but stinks. These changes are seen more commonly in certain situations and under particular circumstances. Thus putrid, dark-coloured matter, with mixture of air, is met with in suppurations near the anus, or the male urethra, in the perinæum or scrotum, in and more or less near the entrance of the female organs of generation. This peculiarity is not dependent on the existence of communication between these outlets and the abscesses; for it is observed where there is no such communication, nor is it a constant occurrence in the abscesses of such situations.

It may be considered probable that the neighbourhood of the large intestine has some influence in producing the phenomenon. A lad, about sixteen, was under my care in St. Bartholomew's Hospital, with a considerable inflammation in the parietes of the abdomen, immediately over the ascending colon. This complaint had showed itself very soon after an inflammation of the bowels. Fluctuation became manifest, and I punctured the swelling, giving issue to six or eight ounces of thick, white, and apparently well-formed pus, but very fetid. The abscess healed quickly and favorably.

The presence of blood promotes decomposition of pus; thus, in all cases that I have seen of suppurating aneurismal sacs, where the matter has been mixed with coagula, it has been fetid. An Irishman was under my care with a swelling in the middle of the thigh at its inside; it was firm, and exceedingly painful. Leeches, poultices, and other means were employed, with little or no relief, and the patient continued to complain of severe pain. After some time fluctuation was perceived, and I evacuated by puncture two or three ounces of fetid pus mixed with coagula. The patient soon recovered. In a person who died of phlebitis, an abscess had occurred in the arm, and was opened before death. It contained fetid pus with a mixture of coagula.

Matter which has been in contact with dead bone is usually stinking.

This decomposition and stinking state of matter are not unfavorable circumstances. Both the local and general symptoms are severe; but, when the abscess has been freely opened, the recovery proceeds just as favorably and quickly as if the matter had not displayed these peculiar characters.

A middle-aged woman who had been previously healthy, came under my care in St. Bartholomew's with an extremely painful, bright-red swelling on the inside of the thigh at its

upper part, extending to the perinæum and side of the vulva. It was of recent origin. I let out between six and seven ounces of the most stinking matter I ever smelt. She was immediately relieved. At the end of a week the opening had closed, and the patient was in perfect health.

CHAPTER VIII.

CHRONIC ABSCESS.

Chronic abscess bears the same relation to the phlegmonous suppurations just described as chronic does to acute inflammation. Suppurations, however, like the inflammations producing them, cannot be included in two divisions. The most violent and active present a striking contrast in all points to the most languid and slow, but there is an indefinite number of gradations connecting the two extremes, some of which might be referred with equal propriety to either division.

The local symptoms preceding the formation of chronic abscess are sometimes so slight as actually to escape even the attention of the patient. There is no redness, heat, or pain; and the patient may not know that disease exists till the presence of matter becomes obvious to the sight by enlargement of the part.

A medical practitioner once brought to me a youth, his apprentice, wishing that I would examine a tumour above the hip. To my utter astonishment I found a large abscess there. I asked the practitioner how long it had existed. He said he was unaware, for the youth had only spoken of it a day before. From the swelling, punctured on the following day, more than a pint of matter escaped. Now this lad, who had been following his ordinary avocations, found the incon-

venience so slight, that he had not communicated on the subject to those about him.

In September, 1828, I was consulted by a gentleman of forty, stout, and in good health, for a tumour in the neck, respecting which he had received an opinion that excision would be necessary. It had existed for two years, having formed slowly and without disturbance of health. Fluctuation being discovered on careful examination, I punctured, and let out three ounces of thin, light, yellowish-brown, turbid fluid. The opening closed after discharging for some time, leaving the parts apparently in as perfect a state as on the opposite side. The collection was renewed, broke, and healed after discharging for some time, still without pain. It reformed and required relief three or four times more at distant periods.

In consequence of these collections forming without previous apparent inflammation, without heat and redness, the part retaining its natural colour and temperature, they have been called cold abscesses, abscessus frigidi, in opposition to abscessus calidi, or the results of active inflammation.

These cold or chronic abscesses are as different from the hot or phlegmonous in their progress as in their origin and attendant symptoms. They spread in the circumference, without disposition to come to the surface, and thus attain a large size, going on for weeks, months, or even years. They break ultimately. In the case just related of abscess in the neck there was no appearance of tendency to breaking at the end of two years.

In these cases the indolent character of chronic suppuration is most strongly marked; there are numerous gradations between these and the phlegmonous, with occasional diversities, of which we do not always trace the reason.

I saw a gentleman, between forty and fifty, on account of a

swelling near the anus, which had formed without pain. On March 31st, he had felt something unusual in the seat of the disease. A swelling came and gradually increased till April 6th, when I saw him. There was a considerable enlargement at the side and towards the front of the anus, of a deep red colour, soft in the centre, and firmer in the circumference. He had not been indisposed, and had felt nothing more than a slight prickling sensation. I evacuated about three tablespoonfuls of thick, white, inodorous pus, and the part healed soundly.

Pain sometimes precedes and accompanies these slow suppurations, and of course it may be expected to occur more or less considerably in conjunction with external evidences of disturbance in those which lie midway between the two extremes.

The matter of chronic abscess is contained in a cyst, which is organized as in the phlegmonous, but is thinner and less dense. Such a cyst affords a feeble barrier to the matter; hence the indefinite increase of these collections, especially when under unyielding parts, as fasciæ, and when they are situated in loose cellular texture. When the cyst of an abscess is so thin, its existence is hardly recognised by external examination. There is a strong contrast between the softness and indefinite outline of such a collection, and the thick solid wall of adhesive inflammation which bounds a phlegmonous abscess. The thinness of the cyst and the want of disposition to come to the surface lead to an almost indefinite extension of the mischief in some situations, as in the collections called psoas and lumbar abscesses, in which the increase is favoured by gravity. Under the excitement of disease in the lower dorsal or in the lumbar vertebræ matter forms behind the peritoneum and descends through the loose areolar tissue covering the muscles along the side of the pelvis into the thigh under Poupart's ligament, or it may

take a course towards the loins, or escape through the back of the pelvis. In the first of these cases the matter may descend along the thigh to the knee; and I have seen more than seventy ounces of fluid evacuated by puncturing such a collection; in the third instance it may reach the ham. When matter has thus gravitated to a part distant from the spot where it was formed, it may be called an abscess in, but not of, the part. The want of tendency to come to the surface, and the ready disposition to spread, may render it necessary to discharge the contents of such abscesses by puncture. In other instances the cyst is dense and thick, so as to render fluctuation very obscure, or altogether imperceptible. From their slow growth, absence of pain, and firm feel, such swellings may be mistaken for solid tumours, and may be extirpated accordingly. Hence, in case of doubt, a preliminary puncture should be made, which may save the patient from a severe operation.

A man from Wales, came to St. Batholomew's Hospital, with a large, firm swelling in the neck, under the sterno-mastoideus, extending nearly from the angle of the jaw to the sternum. It was considered a solid swelling by all who saw it, and I removed it; when it was found to be a tough and thick cyst full of pus.

A healthy female of forty had a firm swelling in the axilla, as large as a small orange, which had arisen gradually. I examined it carefully two or three times, and thinking it a fleshy tumour, appointed a day for its extirpation. Everything was prepared. I again examined carefully before placing the patient on the table, and fancied there might be fluid. I accordingly punctured, and discharged nearly a teacupful of tolerably well-formed matter.

I admitted into St. Batholomew's an elderly female, with an enlargement behind the sternum, supposed to be of aneur-

ismal character. There was a fulness behind the first bone of the sternum and the right sterno-clavicular articulation attended with strong pulsation. I considered that it might be a dilated artery and watched the case. The swelling gradually came forward and broke, having been a chronic suppuration with strong cyst.

A girl was under my care for some months in the hospital with a solid tumour of the ilium, which was suspected to be of osseous or cartilaginous character. In course of time it softened, and proved to be a chronic abscess, upon examining which that curious sensation common to thick-walled cysts containing a moderate amount of fluid was noticed, namely that of a circular depression of bone, with a sharp circumferential rim, such as is felt when fluid blood is extravasated under the scalp.

These cases show what mistakes may occur with regard to matter formed with very little previous inflammation; and they afford an important caution, that in any instance, in which you think of extirpating a doubtful tumour, a preliminary puncture should be made. They show you that, in certain cases, though the formation of matter takes place in this insensible way, there may be as much condensation in the surrounding tissue as to give the feel of a solid body, though in chronic abscesses the cyst is generally thin. In the instance of the gentleman before spoken of, in whom the tumour formed in the neck, and had been there two years, the cyst was so thin, that when the matter was discharged you could not have supposed there had been any swelling at all; one side of the neck appearing just like the other.

Another striking point of distinction between chronic and acute abscesses is afforded by the different character of the contents in the two cases. The former contain generally a thin fluid often of nearly watery consistence; it is frequently

characterised as serous, usually more or less turbid, sometimes like whey, sometimes of a brownish tint or dirty hue. Sometimes the fluid is entirely of this thin serous or whey-like character, hence the name of lymphatic tumours, under which these collections have been described. In this serous or lymphatic fluid there is generally an admixture of flakes or shreds of various sizes. They are either soft or curdy, or tough and fibrous, sometimes spoken of as consisting of lymph; the soft ones may be so, but not the large fibrous and cellular masses, which are often seen. The matter may be thicker and yellower, but then it is flaky or curdly, and not homogeneous like good pus. Sometimes in evacuating a chronic abscess we find the upper part of the fluid thin and serous, the lower portion purulent, having subsided from its greater specific gravity. When we see a swelling forming without heat and pain, and containing an almost watery fluid, we may hesitate in regarding it as the result of inflammation, and in giving to such fluid the same name as that which belongs to the very different production resulting from active inflammation; but there is a gradual transition from these to the most acute cases. If any doubt could be entertained on this point, it would be removed when we see that if active inflammation supervenes in a case of chronic abscess, from which a watery fluid hardly recognisable as matter has been previously discharged, the secretion assumes the character of pus such as might come from a phlegmonous suppuration. This occurred in the following case, which illustrates strikingly the interesting peculiarities under which chronic abscesses are occasionally seen :

Case.—A person of spare habit, twenty-six years of age, and accustomed to close occupation as an engraver, previously healthy and moderately strong, had pain in the back in

June, 1828, regarded as lumbago. This lasted till June, 1829, when a tumour appeared and gradually increased. In June, 1830, when I first saw him, it was as large as my head, at the back of the loins and pelvis, obviously containing fluid, without pain or impulse on coughing. There was stiffness of the loins, so that he bent the knees to reach anything on the ground. He was thin and pale, but rest, appetite, &c., were good, and he had walked from his residence, two miles, to consult me. I punctured it June 15th; five pints of dull yellowish watery fluid escaped, completely emptying the tumour. The puncture healed; I applied a broad bandage, enjoining rest. On July 15th he had completely recovered, and walked to see me, when puncture was repeated, two and a half pints of serous fluid discharged, with a few small flakes towards the end. The puncture healed. It was repeated, and a pint and a half drawn off. In about a week, although the puncture had healed as before, in consequence of imprudent liberties, violent inflammation of the cyst came on, with high fever. A free opening was immediately made, giving issue to three pints of thick fetid pus, and then left open. August 18th. The fever soon disappeared, the tongue was now clean, and the appetite good. Soon after the pulse became accelerated, and he grew thin. A large abscess formed in the back, which was punctured. He died hectic, the original abscess having healed.

Chronic abscesses, although slow in progress, break at last, and discharge their contents. Instead of healing quickly after such an event, as phlegmonous abscesses do, they go on discharging for a long time, close very slowly, and often give rise to permanent fistulæ.

When they open spontaneously, and more frequently when punctured, the surface of the abscess may become inflamed, and the secretion is altered. It is thin, fetid, and irritating

to the parts. If air is admitted into the cavity, the pus lodging there is decomposed and rendered irritating, and thus perhaps excites inflammation in the cyst. The inflamed cyst, often very extensive, acts sympathetically on the stomach, alimentary canal, circulation, and secretions, producing fever. This constitutional disturbance reacts on the local mischief. The local malady, with its excessive discharge, and the general reaction, reduce the powers, generally feeble in these cases, and the patient dies hectic.

It may be questioned, whether the local mischief and the general disturbance are produced in these cases by the putrefactive decomposition of the matter consequent on the introduction of air into the abscess; or, whether inflammation of the cyst is the first event, and the changes in the matter are secondary. The occurrences now specified are seen when we have no reason to suppose that air has been admitted, and where the matter cannot be said to be putrid. The matter may become altered and fetid, the abscess being entire, if inflammation is produced in the cyst, as in the case last related. When putrid matter is confined, it causes great constitutional disturbance, and complete relief ensues from its discharge.

Causes.—Chronic abscesses sometimes owe their origin to obvious local exciting causes, such as caries of bone, or disease of a joint. Psoas or lumbar abscess and suppurations around the hip are examples. These are usually chronic affections, occurring in unhealthy constitutions. The nature of the suppuration corresponds with that of the original affection, and with the constitutional unhealthiness. When the affection of bone or joint is more acute, as from external injury in a healthy subject, the surrounding inflammation is more active, and the suppuration has the same character.

Chronic abscesses more commonly come under the head of

spontaneous inflammations, that is, they arise without obvious cause. They occur, not in healthy individuals, but in those whose constitutions are naturally feeble, especially in the scrofulous, among whom suppurations, although sometimes active, are more commonly chronic. They may also occur in those whose naturally good constitutions have been impaired by various causes. Thus, in both descriptions of cases, there is constitutional imperfection, which accounts satisfactorily for the peculiar character and progress of the disease. Hence you understand the epithets good and laudable applied to the thick pus of phlegmonous suppuration, as contrasted with the thin, wheylike or watery matter of chronic abscess.

The treatment presents much greater difficulty than that of phlegmonous abscess, inasmuch as we have to contend, not merely with the local mischief, but with the constitutional unsoundness to which that owes its origin. Our objects will be to strengthen those in whom the frame has been originally feeble, and to restore health where it has been impaired by depressing influences or bad habits. The circulation should be invigorated by nutritious and generous diet, with such kind and amount of stimuli as can be taken without excitement. The aid of strengthening medicines, particularly bark and steel, will often be required. Other vegetable tonics and bitters, with the dilute mineral acids, may also be useful. Residence in pure air, more particularly that of the sea-side, is advantageous, with as much of open-air exercise or enjoyment as the general health and state of the disease will admit. If the stomach and bowels require assistance, it must be given by such mild means as will not weaken. When the constitution has been invigorated by these measures, the abscess will remain stationary, or sometimes even lessen. If the matter should be coming forwards, we may leave the

case to its natural course. By some this is preferred, as a general rule of practice. At all events, if the question of opening is doubtful, it will be safer to abstain. If the collection, already considerable, is still increasing, without any tendency to break, open it surgically, in order to limit the extent of mischief. When the matter has all escaped, close the opening carefully with adhesive plaster, to take the chance of healing by adhesion.

The course now recommended does not differ materially, so far as the abscess is concerned, from that proposed by Mr. Abernethy for the treatment of psoas and lumbar abscesses, except that in his plan the opening would probably be made earlier. He punctured cautiously, to prevent passage of air into the cyst, allowed the contents to flow out without squeezing, and closed the wound carefully. Puncture was repeated once or more, when matter had accumulated to a smaller amount than at first. The proposed object was to give opportunity for gradual contraction of the cyst, with the intention of opening it freely when much reduced in size, and then leaving it to heal by granulations. The almost constant complication of carious vertebræ with these abscesses sufficiently accounts for the want of success which has led to the abandonment of this plan.

Some surgeons prefer evacuating the matter by means of a trochar. The only objection to this is the frequent intermixture in these cases with the fluid pus of flakes which may be too large to pass through even a full-sized canula.

In one of the great hospitals of Paris a practice is almost universally resorted to of employing drainage tubes, which are about equal in size to the largest urethra bougie, made of India rubber, open at both ends, and sufficiently long to enter the abscess fairly after it has been evacuated, and to leave one or more inches on the outside. The object is to

prevent re-accumulation, and thus accelerate the contraction of the cyst. With a free opening, re-accumulation cannot occur. The question then will be, whether it will be best to trust for the contraction of the cyst to the natural progress of such a case, or to attempt ensuring it by introducing into the cavity a foreign body, which is likely to excite irritation, in some cases at least. If these tubes are employed in all abscesses, the great majority will certainly get well, and we may therefore conclude that their introduction does not prevent the cure.

The cases to which the preceding observations are most applicable are those in which the chronic character is most strongly marked in all respects, and particularly the psoas and lumbar diseases. The termination is so frequently unfavorable, whether they burst naturally or are evacuated by puncture, that we willingly defer the latter measure as long as possible, employing in the meanwhile all means calculated to build up and maintain constitutional power. We are driven at last, by the increase of the swelling and the desire of the patient, to make an opening, explaining previously the dangers incidental to the changes which take place in the cyst, and observing that the termination may be regarded as sufficiently favorable if the latter is obliterated, leaving behind a deep fistula, of which the duration may be indefinite.

There are numerous spontaneous suppurations, which, from their duration, might be termed chronic, although the attendant symptoms and the character of the pus approach to those of the more active kind. They may form with pain, or become painful in their progress; as they increase there is heat, and great suffering from stiffness and tension, especially when the external tissues are thick and unyielding, so that attempts at motion are almost unbearable. A free incision evacuates well-formed homogeneous pus, with perfect relief,

and the cure proceeds favorably, though not so rapidly or uninterruptedly as in genuine phlegmonous abscess. A patient, about forty, and previously healthy, came into St. Bartholomew's, under my care, with a large abscess of four weeks' duration. It filled the space between the scapula and spine; it was firm and resisting, so that fluctuation was obscure. He was in great pain night and day, complaining of tightness on the shoulder and back, rendering him unable to move from the position in which he lay, nearly on his face, with the head and upper limb supported. A free incision, by which twenty-four ounces of well-formed pus were discharged, gave immediate and perfect relief. The escape of matter had nearly ceased in three weeks. About the same time, I had under my care a woman, between thirty and forty, with great and most painful enlargement of the thigh, of not less than ten weeks' duration. The increase of size began in the upper part of the thigh; it was firm, as if involving the bone; and the severity of the pain, which impaired appetite and rest, favoured the supposition. The nature of the affection at this time was quite obscure. The swelling gradually extended, so as to occupy nearly the whole front and inner side of the limb; suppuration was now discovered, and pain was less, though still considerable. I let out thirty ounces of good pus by a free puncture, deeming that the only resource, although the result, considering the great extent of the mischief, appeared altogether uncertain. Matter of good quality was discharged abundantly for three or four weeks, the strength being kept up by generous diet and stimuli. The flow of matter ceased gradually, health and strength returning in the same proportion.

Anomalous cases of suppuration, presenting a singular contrast between the slowness of their progress and development and the perfect character of the contained pus,

are of occasional occurrence. I have seen a few examples in the female breast, and none more remarkable than that of a healthy married woman, aged thirty-four, from the country, who had borne three children, the last of whom she had suckled until within a few weeks of her admission into the hospital. There was a swelling, not painful nor hard, occupying nearly the external half of the right breast. It was about equal in size to a hen's egg; the integuments were loose over the entire surface, and the swelling moved easily on the subjacent parts. There was a feeling of softness on the surface, and careful examination detected fluctuation. This disease had begun more than three years previously, with a loose and painless knot, not larger than a nut. It had slowly attained its present size almost without pain. When closely questioned on the point, she said that for two or three months she had felt sometimes a slight prickling in the part, but without pain, or even uneasiness. The swelling occupied the whole thickness of the mammary gland, which was not large. Considering the case to be cystic disease in a portion of the gland, I made an exploratory puncture with a grooved needle, along which a drop of pus escaped. More than an ounce of well-formed pus was now discharged by a free puncture, leaving the affected portion of its natural size and soft feel.

The fistulæ remaining after chronic abscesses, which indeed are sometimes excavations, rather than the mere pipes which the name would imply, may be treated in various ways. Compress and bandage will sometimes effect the closure; the previous injection of a strong solution of sulphate of zinc, for instance twenty grains to the ounce, may be resorted to. The astringent injection may be used alone. A seton may be placed in the tube so as to excite inflammation in its surface. In failure of such measures, it will be necessary to lay the part open by simple incision. Should the tube be

long, one half may be cut at first, and the other after the first incision has healed.

The practice of throwing into a chronic abscess, after drawing off the contents by means of a trochar, injections containing tincture of iodine is recommended to us by the high authority of the justly respected surgeon of La Charité, by whom it seems to have been first employed. I do not know the strength or quantity of the injection used by M. Velpeau, nor whether he leaves it in the cavity wholly or in part. I have injected the tincture in various degrees of dilution, from one to four proportions of distilled water, in a quantity from half an ounce to an ounce and a half, leaving it in the abscess, and closing the opening. It is a safe proceeding, and certainly checks secretion so as to retard fresh accumulation. It will probably require to be repeated. The pure tincture of iodine, injected on one occasion by mistake, did no harm. I am unable at present to appreciate the plan fully, from want of sufficient experience.

They who propose to adopt this treatment must take care to employ a trochar and canula sufficiently large to let portions of curdly or flaky substance pass, otherwise the cyst might not be properly evacuated for the reception of the injection.

HECTIC FEVER.

The constitutional disturbance which accompanies the copious suppuration of a chronic abscess, after the cyst has inflamed and the case is proceeding unfavorably, is called hectic fever.

Hectic, a term of Greek origin, means habitual; and this fever is the continued constitutional disturbance seen in a system weakened by continued and serious local disease, more especially when such disease is attended with suppura-

tion. Hence it has been sometimes called suppurative fever; this is an objectionable name, because suppuration often occurs without such fever, while, on the other hand, hectic may take place where there is no suppuration.

Hectic being a febrile disorder, kept up by a serious local disease, may occur in medical as well as in surgical cases. Pulmonary hectic is nothing peculiar; it is merely this disorder accompanying disease of the lungs, and it may be found in such disease, as well as in affections of joints, without suppuration.

There is a correspondence in nature and degree between local disorders and the general disturbance, which they excite sympathetically. A compound fracture causes violent inflammation of the limb, and suppuration; this is attended with inflammatory fever. The formation of matter lessens the disturbance. Repeated inflammations and suppurations occur, accompanied with renewed febrile attacks. The strength of the patient is reduced; and now the condition of the limb is altered. The firm swelling of acute inflammation is exchanged for œdematous tumefaction; the soft parts are flabby, and a thinner matter is discharged in large quantity from the seat of the various suppurations. This change in the part is accompanied by an analogous alteration in the febrile symptoms. The patient becomes hectic; his fever may be said to have become chronic.

In hectic, whether it arise from a change in the local symptoms caused by a severe injury, such as a bad compound fracture, from irritation in the cyst of a chronic abscess, or from disease in some important organ, such as the lungs or a large joint, there is considerable disturbance of the circulation. The pulse is accelerated, rising to 120 or upwards, and going on at that rate for weeks or months. The circulation, however, is variable; the surface generally, and the countenance

in particular, being sometimes flushed and heated, sometimes pallid and chill. Slight exertion will bring on flushing, which ends in perspiration. The functions of the digestive organs are often disturbed. Towards the latter part of the affection purging comes on. At the same time there is profuse perspiration. The abundance of these discharges is marked by the epithet colliquative, or melting, which implies that the substance of the body is wasted by these profuse secretions. The nights are generally restless and uncomfortable.

The symptoms do not remain the same through the twenty-four hours. There is an evening exacerbation, with acceleration of the pulse, and increased heat. This burning heat is succeeded by profuse perspiration, which soaks the night-clothes as if they had been dipped in water. Towards the morning the patient becomes comparatively free from fever, and may remain so through the day.

It has been asked, whether hectic can be cured. The question should be, whether the disease which has caused these symptoms can be cured; whether we can remove the local excitement on which the general disturbance depends; if you can do this, you can cure hectic fever. In many cases the local disease is uncontrollable; you cannot expect to cure the fever while the causes which have produced it remain in full force. But the symptoms of hectic will cease when the source of irritation is gone, as in the case of a diseased joint, which we can amputate. After such an operation the patient will sleep soundly, though he has been without rest for weeks; the circulation is tranquillised, the appetite returns, and the strength is soon recovered.

Treatment.—If we regarded merely the vascular excitement, we might think it necessary, in treating hectic, to adopt means for lessening the disturbance of the circulation. But

you must consider the general condition of the patient. No powerful means, nothing of a depressing kind could be borne. The object is to sustain strength by means that do not excite. Let the patient take light but nutritious diet. Light tonics are advantageous, such as bark or cascarilla, with the mineral acids. The latter are useful in checking the profuse perspiration. Narcotics may be employed when the patient does not rest. We thus adopt palliative measures; endeavouring to support strength, and to soothe where we cannot hope to cure.

CHAPTER IX.

ULCERATION.—VARIETIES OF ULCERS.

ULCERATION.

This process was believed by Mr. Hunter to be the work of the absorbents, and he called it ulcerative absorption, to distinguish it from the gradual removal of structures by which collections of blood or matter, aneurisms and tumours, are brought to the surface of the body, or to that of mucous membranes having external outlets, and from the general shrinking by which diminution of bulk is effected without breach of surface. These natural processes were called by him respectively progressive and interstitial absorption. This view, although supported by an authority of the greatest weight in physiology and pathology, does not rest on any direct evidence, and it involves the assumption of a close analogy between ulceration, which is a disease, and these so-called progressive and interstitial absorptions, which are of a restorative nature. In recent times the close analogy of mortification and ulceration could not fail to attract notice. We observe in both the same essential feature, that is, loss of vitality or destruction, and both are preceded and accompanied by vascular disturbance of the part, which in most cases can be justly termed inflammation. The difference is,

that visible portions, of larger or smaller bulk, perish in one case; while in the other the loss of substance is in detail, the disorganized fragments being detached in so minute a form that they generally escape observation, being carried away and concealed by the discharges from the exposed surfaces. Sometimes, however, shreds of decayed tissue may be seen on the surface of an ulcer, and minute particles may be recognised in the discharge of a spreading sore, being more numerous in proportion as this is thinner and less puriform. Again, the pus flowing from a cavity in which there is dead bone is loaded with granules of phosphate of lime. This mode of dilapidation has been sometimes not inaptly characterised as molecular disintegration. The close approximation of the two processes is still further illustrated by the intermediate gradations, which conduct us so insensibly from one to the other, that we are sometimes in doubt to which of the two particular cases should be assigned. Again, the two modes of destruction not unfrequently exist in different portions of one and the same diseased surface, as we may see in syphilitic phagedæna, both primary and secondary, in hospital gangrene, and even in spreading ulcerations of less formidable character.

There is no better exemplification of ulceration than in the separation of a slough from the living parts when mortification has ceased. There is first adhesive inflammation, with redness, heat, and swelling, by which the textures are thickened, and blood-vessels are closed; loss of substance follows. Ulceration, then, is loss of vitality in the component particles of a tissue, with discharges which, at first thin and perhaps tinged with blood, soon become thicker and purulent. The breach of surface thus produced is an ulcer. It is a vital, not a chemical or mechanical process; it is not erosion. The loss of substance is not originally produced, nor is the

chasm subsequently extended by any corrosive or destructive agency of pus. This fluid has no solvent power over the animal structures.

The origin, progress, and general phenomena of ulceration, vary according to differences of texture in the part affected; of nature in the inflammation, which may be common or specific; and of constitution or health in the individual.

All textures are susceptible of ulceration, as we see in the separation of a mortified limb, where the ulceration will go through skin, cellular membrane, fascia, muscles, tendons, nerves, blood-vessels, and bone, so that the member may be detached by a natural process. But all are not equally liable; skin is the most prone, then mucous membrane, which is a kind of internal skin, and cellular tissue. It occurs frequently in bone, in articular cartilages, and in the cornea. Fibrous structures, such as fascia, tendon, and ligament, are the least susceptible. Hence abscesses under them are slow in coming to the surface.

All newly formed parts are weaker in vitality than the original structures, and ulcerate more easily.

We are best acquainted with external ulceration, where its origin, progress, and mode of repair are under our immediate observation. The following remarks apply directly to this, and, under modifications, to ulceration in other situations.

External ulceration is preceded by inflammation, and generally accompanied with more or less of pain. The skin is red, of increased temperature, painful, and somewhat swollen. The cuticle becomes loosened and whitish, the part is then livid. When the loosened cuticle is removed, one or more small openings, or several slight cracks of the skin, are exposed; a portion of the texture has been lost, leaving a rugged, yellowish, or grayish surface, sometimes spotted or streaked with blood; the surrounding skin is red, hot, and

painful. The ulcer enlarges in extent and in depth, the edges remaining red and painful; the surface is yellowish, whitish, or darker, irregular, and sometimes presenting shreds of decaying textures; the edge is sharp. There is a thin, serous, or slightly opaque discharge, which is sometimes bloody.

When ulceration stops, the breach which it has caused is filled up, and the surface is restored by other processes, which are nearly similar under the four following circumstances: 1st. On the surfaces of chasms produced by ulceration; 2ndly, on that left by the separation of a slough; 3rdly, on the exposed surface of an abscess or fistula; 4thly, on that of a wound with loss of substance, or separation of the sides.

A new material springs up at various points in small portions, gradually becoming more numerous, and coalescing into a more or less uniform covering of soft red substance, which rises on its surface into rounded or pointed prominences of various size, and kept moist by secretion of pus. The prominences are granulations, and the process itself is called granulation. The secretion of pus is not an invariable concomitant of the process; it is not seen in the case of ulceration of the articular cartilages, or in that of the cornea.

This process of restoration consists in the deposition of the plastic material, fibrine, formerly called coagulable or organizable lymph, and in its organization; it soon possesses blood-vessels, absorbents, and nerves. The effusion of fibrine is analogous to what occurs in inflammation; there is at all events increased vascular activity, manifested by greater redness. Dr. J. Thomson found the heat near the edge of a sore two degrees higher than in the rest of the limb. ('Lectures on Inflammation,' p. 407).

Blood-vessels are visible in granulations to the naked eye, and may be seen in immense number with magnifying-

glasses. They cause the redness of granulations. This vascularity is proved by injections and by bleeding on slight injury. Further proof is afforded by the profuse secretion of pus. That granulating surfaces have the power of absorption, is shown by the effect of active substances such as opium, mercury, arsenic, when applied to them. They act in the same way as when taken into the stomach. Absorbents cannot, however, be demonstrated in granulations, and the absorbing power of these growths may depend on their veins, whose thin walls may admit the introduction of foreign matters. Although nervous fibres cannot be shown, the sensibility of granulations is unequivocal; they are often exquisitely painful.

The time required for organizing the new material destined to repair the breaches of surface caused by ulceration is short. When the process of destruction has ceased, little red shoots are seen coming through the previously gray and disorganized surface at the end of twenty-four hours, and they then multiply quickly, so as soon to constitute a continuous mass. The mode in which blood-vessels form in the granulations has been made the subject of special inquiry. Small outgrowths arise from pre-existing vessels; they gradually elongate, pursuing an arched course, until, meeting and coalescing with a neighbouring outgrowth, they form a loop, which again gives origin to other loops. Thus veins too are formed; for capillary vessels consist, as the larger vessels, of both arterial and venous tubes.

Is repair accomplished in the manner now described in all textures? It is so in mucous membranes, cellular substance, in the brain, muscles and tendons, and in bones. How is it in the cornea and in articular cartilages?

We cannot fail to remark the striking analogy between this repair and what happens in inflammation and the union

of wounds by adhesion. When two granulating surfaces are brought into and maintained in contact, they unite; their vessels inosculate. This may be seen occasionally, when a bruised flap of scalp which has granulated is brought in apposition with a granulating surface of the head. So strong is the disposition to union, that we are unable to prevent it when a granulating surface of the eyelid is in contact with a similar surface of the eyeball, and thus accretion of the lid to the eye, constituting symblepharon, inevitably results. Some amount of exposure is necessary for granulation; entire abscesses and sinuses do not granulate. The superficial, when exposed, granulate most easily; when they extend deeply, the disposition to this process is lessened. Hence arises the necessity of keeping the edges of an incision apart when we wish to insure healing from the bottom.

Granulation has been said to be a property of the cellular texture, but I question whether it is so exclusively. As this structure enters into the composition of all organs, it is difficult to determine the point. Granulation is certainly most active where the cellular texture is the most abundant, as in wounds or burns, where the subcutaneous stratum is exposed. Too exuberant granulation is termed in common language proud flesh. When the chasm of an ulcer, or the exposed surface left by the separation of a slough, or that of a wound, abscess, or fistula, is filled up, a smooth pellicle forms over the surface at the edge of the sound skin; the granulations shrink, the secretion of pus ceases. This pellicle gradually extends from the circumference to the centre, till the whole surface is covered. This constitutes the cicatrix or scar, and the process is called cicatrization. A cicatrix is at first thin, red, delicate, and easily torn: it gradually becomes white and strong, and may even be firmer than the original skin. Although always sufficiently answering the purpose of resto-

ring the surface when damaged by loss of substance, cicatrices may present differences of character under different circumstances. When ulceration has been confined to the surface of the skin, without going through the texture, the cicatrix which begins at once over the whole surface, is thin, pale, and smooth, as large as the sore, since there has been no loss of integument, and free from puckering in the circumference. It is, however, immediately distinguishable from the natural skin by the absence of the fine lines and hairs of the latter, and by the want of that combined softness, elasticity, and strength, which belong to the true skin. When there has been much loss of substance, the scar will be irregular and hard, often with contraction of the surrounding skin.

It has been stated that the rete mucosum is not reproduced in the dark races. Cicatrices have been at least partially coloured where I have seen them in negroes. Absorption of the granulations goes on *pari passu* with the formation of the cicatrix, causing a regular contraction of the scar, accompanied by elongation of the surrounding skin. This process, which continues throughout the whole course of healing, and sometimes for months afterwards, causes contraction of the sore by its circumference being drawn towards the centre. Hence a cicatrix or scar is much smaller than the ulcer was, and the sound skin is drawn from the neighbouring parts to make up the difference. Where the integument is loose, and the ulcer or wound of moderate extent, the surrounding skin takes the place of that which was lost, the cicatrix becoming smaller and smaller, and then the peculiar material on which this contracting process depends becomes also absorbed, and the new covering acquires the aspect of a thin, pale, membranous patch. But when there has been a large destruction of skin and subjacent

tissue, as in bad burns, the contraction, which proceeds, though slowly, with an almost irresistible power, draws together such moveable parts as are within its range, and fixing them in unnatural positions, by hard, puckered, and ugly cicatrices, causes, especially in the face, neck, and flexures of the limbs, most distressing deformities, often admitting of only partial remedy.

Reproduction.—Is the cavity of a large ulcer, or that of an abscess, filled up by reproduction of the lost textures before it is healed over? It has been supposed and described that the lost parts, whether skin, cellular membrane, muscle, or others, are reproduced. The loss of substance, however, is rather apparent than real. The inflammatory swelling of surrounding parts gives a deceptive appearance of excavation; and as this subsides, we discover that there has been no loss except of skin, and consequently no necessity for reproduction.

That new matter springs up for the repair of ulcers cannot be doubted. Granulation is the formation of a new organ in the economy for a temporary purpose. But the effect is limited to the uniting of wounds, or filling up of breaches, and does not extend to the reproduction of lost parts. There is a wide contrast between man and the lower animals in this respect. In man no lost part or organ is restored, except the shaft of a long bone; separated parts are united, and that by a medium, which, though clearly distinguishable from the original, answers the end, and enables the part to execute its function, as in muscle, tendon, bone, and even nerve. The breaches of ulceration are closed externally, but the lost substance of a wound or a destructive sore is not reproduced. Hence skin becomes fixed after recovery to muscles or fascia, muscles and skin to bone.

The cicatrix is not skin, but a good and sufficient substitute for it.

Treatment.—In the first stage inflammation is to be lessened by rest, simple diet, and employment of the mildest local means, such as soft poultice of bread or linseed, simple ointment covered by lint dipped in cooling lotions or cold water and frequently renewed. When the restorative process has begun, and is proceeding favorably, the business of the surgeon is merely to assist nature, and remove or avert any obstacles to her efforts. It will be well if he does not interrupt or retard her salutary operations by officious interference. To the part, which is kept at rest and protected from external influences, the local means already mentioned are still applicable. The granulating process often goes on most favorably under simple cold water. A solution of sulphate of zinc may be useful if the purulent secretion should be profuse and the surface of the sore pallid; a slight touch of nitrate of silver or sulphate of copper may be useful, with pressure by bandage, if the granulations should be exuberant.

VARIETIES OF ULCERS.

The nature and treatment of ulcers exhibit numerous and important differences. They may be common or specific. The latter, such as the carcinomatous, syphilitic, and scrofulous, will be considered in other parts of the course.

Even common ulcers, or such as result from ordinary causes in constitutions free from morbid disposition, are various. They are influenced by position, for instance, by proximity to the centre of circulation, or remoteness from the heart; also by situation which may be favorable or unfavorable to the return of the venous blood. An ulcer of the leg will differ in appearance, according as the limb is in the horizontal or the perpendicular posture. Hence ulcers on the trunk heal quicker than those on the limbs, and those of the

upper are less troublesome than those of the lower limbs. Ulcers of the legs are the most numerous, and most difficult of management, especially in tall persons, and those in bad health.

The restorative process is influenced by the degree of general power and the state of health, while, reciprocally, the condition of a sore will affect the constitution. The supervention of fever stops the progress of repair; granulations disappear and ulceration is renewed. If hospital gangrene attacks a healing sore, a powerful depressing influence quickly pervades the frame. Hence an ulcer is a good index of the individual's health.

A healthy ulcer is one in which the restorative processes are going on favorably, and the person is in good health. The newly deposited substance is firm, the granulations are small and pointed, not rising above the edge of the sore; they are of a florid red, as if from the presence of arterial blood in the capillaries. Yet even here the colour will depend on the position of the part, the florid tint being changed to a darker and even somewhat livid hue on holding down the limb, and a few drops of blood may even escape. The pus is thick, whitish, and moderate in quantity.

No additional remarks on treatment are required, except that confinement is neither necessary nor advantageous. With the aid of compress and bandage more or less exercise may be taken when an ulcer of the leg is in a healthy state.

The term indolent denotes a state of ulcer, particularly on the legs of elderly persons or those of weak constitutions, especially after long poulticing. The granulations are large, pale, flabby or spongy, rising above the edge of the sore; there is copious secretion of thin matter. The limb swells, more particularly in the dependent posture.

Treatment.—The effect of position on the return of venous blood, which has been already adverted to, is plainly seen in the arm or leg, according as the limb passes from the horizontal to the vertical position in the state of health. The influence is still more manifest in disease; an inflamed finger swells, reddens, and becomes throbbing and painful when the limb is held down; these symptoms cease on raising the arm above the head. It seems a natural inference that a person labouring under an ulceration of the leg should keep the limb and body in the horizontal position. This is sometimes necessary, and may be said, speaking abstractly, to be most favorable to the healing process. Confinement to bed, however, weakens both the limb and the body, damaging health more or less seriously, and an ulcer healed in that way will surely break out again when ordinary occupations are resumed. Pressure acts powerfully in aiding the return of venous blood and giving strength to the limb, when the vessels are distended and enlarged, and the part is generally swollen. Exertion of the part in such a state brings on heat, pain, and increased swelling; a well-applied bandage prevents this mischief, and enables the patient to use the part with comparative ease. The principal means of treatment in such cases must therefore be the use of pressure, which may be applied to the entire limb, to the part in which the ulcer is seated, or in both ways.

The part of the limb in which the ulcer is placed and two or three inches below and above it should be inclosed with strips of plaster about two inches wide, long enough to go round with two or three inches over, beginning from below and going upwards, each succeeding strip covering one third of that immediately preceding. As the resin contained in the adhesive plaster may irritate the skin, the emplastrum plumbi is pre-

ferable and will adhere sufficiently if it has been made and spread without more heat than is sufficient to liquefy it, and if it is recently spread. Soap plaster, rendered adhesive by a little tar (ʒj to ʒij) might be used. The limb is then covered from the toes to the knee by a roller from seven to nine yards long, of coarse, unbleached calico, stocking web, or other material sufficiently light and elastic. Flannel would in general be too heating. If the bandage is applied before or soon after rising it should not be tight, as it will fit closely, and thus give the required support in proportion as the part swells with exercise. If a feeling of heat and stiffness should come on, the limb may be supported in the horizontal position for a time, the bandage being soaked with cold water. As the amount of discharge is much lessened in this mode of proceeding, the dressing need not be renewed as long as the part continues easy, that is for two, three, or more days, the patient pursuing his ordinary occupation, and taking moderate exercise. Should the use of stimuli or astringents be deemed necessary, such as the nitrate of silver or sulphate of copper in substance or solution, mercurial lotions or ointments, they may be applied at the time of dressing.

The callous ulcer is a variety of the indolent kind. It has a firm and raised edge, with thick white cuticle, a nearly smooth surface, with sparing discharge, and little pain. Such sores are seen about the ankle in elderly and weak persons. The want of restorative effort suggests the use of stimulating dressings. In other respects they may be managed in the same manner as the indolent. I have seen it necessary to pare the callous edge.

Varicose ulcer.—A varicose state of veins, caused by the dependent position of the lower limbs, and consequently unfavourable return of blood, often leads to inflammation and

ulceration of the integuments, the ulcerations being painful and difficult to heal, but not presenting any other peculiarities. Not unfrequently the surrounding integuments, to a greater or less extent, are in a state of chronic eczema. There is sometimes inflammation of the neighbouring veins, with great pain. It is necessary in the first instance to remove this inflammation by rest, poulticing, and probably leeches, which may be employed, not only safely, but advantageously on the inflamed skin and over the inflamed veins. When the parts have been brought into a quiet state, and repair is beginning, general pressure of the entire limb below the knee, by an elastic bandage, will be most useful, and the continual employment of support by bandage or elastic stocking will be necessary to prevent relapse. The eczematous state of the integuments may be remedied by a strong solution of nitrate of silver after the surface has been thoroughly and perfectly cleaned. The irritability of the ulcer may sometimes be removed by the same application.

Inflamed ulcer.—Inflammation is the source of ulceration in most cases ; hence nearly all are at first inflamed ulcers. The continuation of ulceration indicates extension of inflammation, and its supervention in a healing sore stops the healing, and produces relapse of ulceration with enlargement of the sore. We have now to consider the last-mentioned subject. The degree of disturbance varies greatly, the differences being loosely marked by the term under which the cases are mentioned, as ill-conditioned, painful, irritable, inflamed, or sloughing sores. In a severe case the margin of the sore is fiery red, with general swelling, redness, and heat of the limb. The granulations have disappeared, and instead of them the ulcer presents an irregular bottom of a foul, greyish, yellowish, or brownish colour, often streaked with blood. When the

inflammation runs high, partial sloughing may occur, and the destructive process goes on rapidly. Perhaps vessels of some size are opened, and copious bleeding may ensue.

Inflamed sores do not secrete pus, but yield instead of it a copious, thin, generally offensive fluid, or a thin matter of reddish colour from admixture of blood, or a thick, dark-coloured glutinous substance; these morbid discharges being named respectively, *ichor*, *sanies*, and *sordes*.

This state of the part, which is brought on by neglect, even total want of care, and intemperance, and probably aggravated by violent or long-continued exertion, is attended with severe pain, want of rest, and general feverish disturbance. Relief will be afforded by rest, soothing local applications, such as fomentations and poultices, of which that of bread with charcoal is the best, and a dose of Dover's powder or some other opiate at bed-time. Mild stimuli will generally be necessary, as the subjects of such an attack are usually free livers, with such fluid nourishment as the stomach will receive when more solid nutriment cannot be borne.

In cases of less serious character, with inflammation of the surrounding parts, the granulations are converted into a dirty greenish or livid mass, with specks of matter and blood, and thin offensive discharge. The effects of rest and mild local treatment will often suffice, where the state of inflammation has been brought on simply by imprudent exertion.

The healing of ulcers is often retarded by inflammation, although its presence is not indicated by the obvious and striking circumstances just enumerated, especially in young persons, those of full habit, and such as are accustomed to free living. There is swelling of the part, redness of skin, some heat, and pain. Sometimes such a state comes on during the healing of a large ulcer, especially if the patient

be confined to bed, allowed a full diet, the bowels being at the same time costive; he feels uncomfortable, with diminished appetite, mouth clammy, perhaps headache with want of sleep. You examine the limb and find it warm; the sore is painful, the granulations are giving way at some points, the discharge is thin. The active purging and reduced diet which are urgently necessary under these circumstances will probably be sufficient to prevent the serious mischief which might ensue if these premonitory symptoms should be unnoticed or disregarded.

I take this opportunity of impressing on your minds the necessity of watching closely the health of those in whom large sores, especially of long standing, are rapidly healed, or in which extensive outward disease of any other kind is suddenly brought to an end. The copious and generous diet, with the stimuli which have been necessary in a state of weakness to sustain failing power and restore strength, are now sources of danger, and may lead, by overfilling the system, to serious disturbance in the head, chest, or abdomen. I have seen alarming and permanent paralytic symptoms and fatal apoplexy from an entire neglect of precaution in this matter. In proportion therefore, as old discharges or other external disease are brought to an end, the state of the circulation and the excretions should be carefully observed, the quantity of food, and especially of stimuli, being changed in conformity with the altered condition of the body. Our forefathers were probably not altogether wrong in advising that an issue should be opened in the leg when an old ulcer was on the point of closing.

Phagedænic ulceration.—This epithet, derived from the Greek, and equivalent to eating or destructive, may seem a superfluous addition to ulceration, which always implies loss of substance. It is, however, a convenient practical term to

denote cases, not of infrequent occurrence, in which the destructive process is more rapid, considerable, and unequivocal than in simple ulceration. These affections, varying in their degree of activity and rate of progress, might be divided into acute and chronic; and they form an insensible transition from ulceration to mortification, being closely allied to the former in their milder shape, and hardly distinguishable from the latter in their more violent form.

Phagedæna is seen most frequently in syphilis, where it occurs both as a primary and secondary affection, and perhaps more in the latter than in the former shape. It may, however, be seen under other circumstances.

The edge of a phagedænic sore is sharp, often ragged, with livid fragments apparently crumbling away; the margin often red. The bottom is irregular, livid, grayish or tawny, sometimes with viscid and bloody discharge. There is considerable pain in the acute, but not in the chronic form.

This subject will be further considered under the head of syphilis. If we speak of treatment, without reference to the specific character of the affection, it would include bread poultice, perhaps with charcoal or with lint dipped in a mixture of liquor opii sedativus and water on the sore; opium internally, particularly at night, bark or sarsaparilla, with good diet and stimuli.

Sloughing phagedæna—Phagedæna gangrænosa, presents a peculiar disorganization of the affected structures, in which there is more of mortification than ulceration. It is most commonly seen in women of the town, as an occasional concomitant of syphilis, although it is not a direct effect of syphilitic poison, and may occur altogether independently of that disease. I have seen it originate in the hospital. Though generally connected with venereal disease in some shape, it is not neces-

sarily so. I have seen it only in prostitutes and generally in those of the lowest description, and I have not met with it in men.

The predisposing cause of the affection is an unhealthy state of constitution in young and naturally healthy, but often delicate females, who lead a miserable life of prostitution in the worst parts of London, with little protection from the coarseness and ill-usage of the lowest characters. They are constantly intemperate, especially in the use of spirits, and exposed to cold, wet, fatigue, and broken rest. Their wretched calling involves excitement and irritation of the generative organs and parts in their immediate neighbourhood, which are frequently excoriated by acrimonious discharges, of which the effect is aggravated by uncleanliness.

The disease, which is seen most frequently at the side of the labia, in the groin, on the inner and upper part of the thigh or buttock, and particularly in the cleft of the nates, begins with a vesicle or pustule on a raised basis of inflamed skin, painful from the first, and attended with constantly increasing suffering throughout its progress. This soon opens into an angry sore, which spreads rapidly, with whitish and shreddy surface, sharp edge, inflamed margin, and thin discharge. The disease soon assumes its characteristic appearance, measuring from one to two or more inches, and often enlarging with great rapidity. I have seen a fissure of some inches in length and proportionate depth, occupying the cleft of the buttocks, and reaching forward to the side of the labium, formed within forty-eight hours, and blackened by disorganization in its whole extent. The surface, which is irregular and generally more or less excavated, varies in colour, being generally of a dull brownish-red, varied with deeper tints approaching to black, with gray and yellow, as if from thick, adherent matter. It consists of disorganized tissues

blended into a pulpy mass of uncertain depth. The discharge is a copious brown, thickish fluid, of peculiarly offensive odour, immediately recognisable, even at some distance from the patient. Distinct sloughs are sometimes seen; loss of blood from the surface is not unfrequent. The mischief is confined to the skin and the immediately subjacent strata; the surrounding skin is of deep red, with some inflammatory thickening of the parts beneath. The pulse is accelerated and feeble, while appetite and rest are lost from the incessant and severe pain. This formidable and distressing affection seems to be altogether local; at all events, it is completely under the power of a strictly local remedy, namely, destruction of the disorganized tissues by an effective escharotic, capable of penetrating the mass in its entire depth, such as strong nitric acid, which was introduced into practice by Mr. Welbank, a former pupil of St. Bartholomew's, whose paper "On Sloughing Phagedæna," in the eleventh volume of the 'Medico-Chirurgical Transactions,' gives an admirable description of the disease and its treatment.

The mode of proceeding is to protect the surrounding skin by smearing it with oil, or preferably with lard or spermaceti cerate, to remove all discharge and blood, so as to render the surface quite dry, then to soak the disorganized mass thoroughly with strong nitric acid, thus converting it into a brownish eschar, which may be covered with cotton-wool, dry lint or poultice. The surrounding surfaces should be kept as free from moisture as possible. The application of the acid should be made under the influence of chloroform. The severe pain, which may last from one to two hours, may render an opiate necessary. As soon as the pain of the application has ceased, the local and general suffering of the disease will have ended, and the patient may be said to be well. She will probably rest well, and be quite recovered the following

morning, with quiet pulse, good appetite, and cheerful countenance. On the separation of the eschar, after a few days, a perfectly healthy granulating surface is disclosed, which heals rapidly. Strict attention to cleanliness and dryness of surrounding parts is necessary throughout, and the complaint thus ends without leaving behind any liability to further mischief.

I once saw a formidable case of sloughing phagedæna entirely independent of venereal affection. A female between twenty and thirty was reduced to a condition of extreme weakness by a severe attack of smallpox followed by diarrhœa and excoriation, which had caused a large and deep sloughy excavation in each buttock. She recovered under the use of the acid with all the means, both dietetic and medical, calculated to restore and maintain general power.

The question of contagion naturally presents itself to the mind in viewing this serious disease, and the unpleasant secretion which accompanies it. That the discharge does not affect the sound skin of the patient is clearly seen from the way in which it has been applied to nearer and more remote parts of the body before admission into an hospital. It would, therefore, probably not affect the skin of a healthy person; and hospital nurses have never been injured by it, so far as I know. Does it contaminate the atmosphere so as to act injuriously on previously healthy sores in patients occupying contiguous beds or lying in the same ward? We entertain suspicion that it has such influence, and act on the opinion by keeping patients who labour under the affection as far apart from others as possible.

In *Hospital Gangrene, (Pourriture d'hôpital)*, there is a state of sore occurring under certain circumstances in hospitals and analogous situations, so similar in some respects to the preceding affection, that it has been described under the same

name of phagedæna gangrænosa. By the terms hospital sore, putrid, contagious, malignant, scorbutic ulcer, the same, or analogous affections are denoted.

It is a most unhealthy and rapidly destructive condition of ulcers, whether the result of wounds, sores, or ulceration, produced by local causes; appearing in hospitals, prisons, barracks, shops, when filled with bad surgical cases in unhealthy situations, particularly of elevated temperature. The crowding of human beings within a small space is always unfavorable to health, as we see in the occupants of small and overfilled apartments, in the narrow streets and courts of large cities. A noxious influence, of which we do not know the exact nature, is generated under such circumstances. In the ward of an hospital, calculated to hold fifteen or sixteen persons, twenty were sometimes placed when applications were more numerous than usual. It was soon noticed that typhus fever invariably broke out on such occasions. In large hospitals filled with serious diseases, especially extensive wounds and ulcers, when ventilation is not good, the effect is obvious in many ways; in the prevalence of erysipelas, in the unfavorable result of operations, and in the change produced in wounds and ulcers previously healthy. It is clearly ascertained that, for the favorable treatment whether of medical or surgical cases, and of the latter more particularly, when wounds, ulcers, and operations are included, an hospital ward should offer, at least, a thousand cubical feet of atmosphere for each bed, and that an allowance of fifteen hundred feet would be still better.

Hospital gangrene is the local effect of a vitiated atmosphere on the surface of a wound. More general disturbance ensues, as a secondary consequence. In a case which has been previously going on favorably the part becomes painful and hot, the edges are inflamed, suppuration stops, and a serous

discharge takes its place. A thin white stratum spreads over the wound, it becomes thicker and grayish, streaked with blood. It may look yellow, like pus; but you cannot wipe it off. It is a soft, pulpy, or glutinous mass, adherent to the parts below, and resulting from disorganization of the surface and contiguous textures. The edges of the wound and the adjacent skin may slough in successive portions, and sometimes the whole surface of the wound sloughs, with offensive discharge. The ulcer extends rapidly, with great pain, which prevents rest, destroying both in circumference and depth. The patient is pale and weak, with feeble pulse, and loss of appetite. That this dangerous affection is produced by the influence of a noxious atmosphere, and that the number of sufferers, and the succession in which the cases occur in particular instances, depend on their exposure to a common cause, seems to be generally admitted. Whether the disease, when it has thus arisen, possesses contagious properties is more doubtful, though it has been spoken of under the name of contagious ulcer. Its progress is most effectively arrested by separation and dispersion of the patients, with thorough cleansing and ventilation of the apartments they have occupied. The complaint has been hardly known in England, owing perhaps to the precaution of limiting the number of patients in reference to the cubical measurement of wards, and of enforcing sufficient ventilation. It has been more frequently seen in France, especially in the South, as in Lyons and Montpelier, and in Spain. It was unknown for a long time in St. Bartholomew's, where, however, a few cases have occurred at considerable intervals in the last ten or twelve years.

The treatment is essentially the same as that of sloughing phagedæna, namely, destruction of the morbid surface by means of nitric acid or other escharotic of equivalent power,

and supporting the patients' strength by all the resources of diet and medicine. Delpech treated a hundred and fifty cases from Pampeluna, all with cautery, and successfully. The nitrate of silver, and even pure potash, are not sufficient for the occasion.*

* In the early spring of the present year circumstances occurred at St. Bartholomew's, showing that wounds, even of trivial character, may pass into the sloughing state without having been exposed to the unfavorable influences described in the preceding pages, and leading to the belief that they must have arisen from some more general but obscure cause. A healthy youth, about twenty, came to the hospital as a casualty patient with a cut on the forearm near the wrist, less than an inch in length, and over the radial artery, which it had not injured. It was properly dressed, and he returned in three days, when it was dressed again, the edges not having united. He came again in three or four days, when I saw him, with a circular sore as large as a half-crown, covered with a dark brownish-black slough; the discharge was a bloody and offensive sanies. He was admitted, and the strong nitric acid was applied with the desired effect, which was only temporary. This was repeated after some days, the result being an exposed surface of formidable aspect more than two inches in diameter, which improved slowly and healed very gradually but completely, the radial and ulnar arteries being obliterated. A nearly similar case was admitted by one of my colleagues about the same time, and it was found necessary to manage even trivial wounds with great precaution. About the same period three men were brought into one of my wards on the same day, with erysipelas, in so dangerous a state from extreme prostration that the free use of brandy was necessary for some time to rally the circulation and bring them into a state of safety.

CHAPTER X.

MORTIFICATION.

MORTIFICATION is the death of a part, *i. e.*, of a part only. *Necrosis*, from the Greek, is a synonymous expression, seldom used except in application to the death of bone.

Mortification is the death of a part, with a peculiar change in its state, the result of a preceding peculiar disorder; hence (that is, in the previous peculiar disorder) it is distinguished from—

1. Simple death, as that of an amputated part.

2. Apparent death, *i. e.*, temporary suspension of vital action with power of recovery, as in a frost-bitten part. This is local asphyxia, that is, cessation of pulsation or circulation, which bears the same relation to local death as suspended animation or general asphyxia does to general death.

3. Chemical decomposition, or the changes produced in living parts by the application of heat, acids, alkalies, and other chemical agents. These are chemical phenomena; mortification is the result of vital changes.

4. Putrefaction, or chemical decomposition consequent on death, that is, alteration of animal structures from the effect of surrounding influences after death. This also is chemical, not vital change.

Putrefaction often follows mortification, but not necessarily; the peculiar change constituting mortification is in some

instances an effectual preservative against the spontaneous alterations, or those caused by surrounding influences, which constitute putrefaction.

Mortification, gangrene, sphacelus, are used indifferently, and may be regarded as synonymous terms, yet there are shades of difference.

Mortification is the more general expression. Gangrene is generally applied to external and superficial mortification. Sphacelus to the death of an entire part or limb.

Dr. I. Thomson proposed to restrict the term gangrene to the state of transition from inflammation to mortification. But no such state, independent of inflammation on the one side, and of mortification on the other, can be defined; nor could we hope to give a new meaning to a word so commonly employed in a clearly understood sense, both by ancients and moderns.

The dead part is called in English a slough; and the process generally, sloughing. The separated cuticle or cast-skin of the snake is called its slough, which is an old Anglo-Saxon word.

Regarding mortification, then, as the death of a part in the sense already specified, the question presents itself, what is the living action necessary to produce the peculiar change of structure constituting mortification? Is it inflammation? Does inflammation always precede? I believe that it does, in some degree or form; if we employ the word in the comprehensive sense of disturbed circulation. However, a part may perish without undergoing inflammation, as from cold, or from the ligature or rupture of its artery; but the change thus produced is simple death, not mortification. See "A Case of Injury to the Blood-vessels of the Lower Extremity, producing pale, dry Gangrene of the Foot," by T. W. Chevalier.* At

* 'Medico-Chirurgical Transactions,' vol. xiii, p. 17.

the situation of the wound in the groin, the femoral artery was found obliterated.

"I have seen two instances in which the limb mortified after the ligature of the principal artery. The part at which the living was connected with the dead flesh exhibited the usual appearances of gangrene. The remainder of the dead parts had not undergone those peculiar changes which take place when gangrene is the consequence of inflammation. They had the appearance of parts which have remained a long time in a dissecting-room. They were of a pale colour, and soon became putrid. The cuticle peeled off, and was followed by an oozing of filthy sanies. I have, however, heard of instances in which the whole limb became black, and presented the appearances which are peculiar to gangrene."*

In a case under my care in St. Bartholomew's Hospital, where the popliteal artery and vein were torn across by a violent injury, the foot and leg became cold, and presented the appearances of a dead limb.

Is the previous local disturbance a certain degree, or a peculiar kind of inflammation?

Mortification may occur at all ages, in all kinds of constitution, and in every state of health. It may take place in all organs, and affect them under every variety of extent. Hence the mode of attack, the state of the affected parts, the kind and degree of constitutional disturbance, and the whole progress of the affection; the prognosis and the treatment must differ most widely in different cases.

Considered generally, this affection is a cessation of vital movement, or, more particularly, of the circulation of a part. The blood ceases to flow; hence loss of natural colour, and temperature, of sensibility, and the power of motion. The part becomes cold and turns of a dirty grayish, yellowish,

* Hodgson, 'Treatise on the Diseases of Arteries and Veins,' p. 265.

greenish, livid, brown, or black hue; or it assumes various combinations of these tints. A sanious or bloody fluid is poured out under the cuticle, raising it into vesications or loosening it generally.

These changes, which are preceded by aggravation of the inflammation, by a deeper tint of redness passing into lividity, and then by diminution of tension, are followed speedily in most cases by putrefaction. When the part, at the time of mortification, is loaded with fluids, these as well as the containing solids, undergo chemical decomposition. The various textures are softened, half dissolved, filled with a fetid sanies or reduced to a stinking pulpy mass. Gas is disengaged from the parts thus changed; and the fetor, which is always present and characteristic, is sometimes overpowering. This is gangrena humida, moist gangrene. It is mortification consequent on active inflammation, and hence may be called acute gangrene.

Sometimes the dead part is found in a state very different from that just described; the preceding inflammation is not considerable, and the mortified portion, although brown or black, is dry, hard, and shrivelled; instead of dissolving by putrefaction, it remains hard and dry, and may be kept for years without undergoing further change. This is gangrena sicca, dry or chronic gangrene.

These two strongly contrasted forms have been named hot and cold gangrenes.

All parts which have a circulation are liable to mortification. Thus we see this change in all the textures when an entire limb has perished. All, however, are not equally susceptible. Cellular tissue is the most prone; skin resists longer. Harder parts, such as fibrous structures, are less subject. Blood-vessels resist more than other soft textures; hence we sometimes see them insulated and entire when the

surrounding soft textures have perished as in sloughing bubo. There is great variety of character and progress in different organs.

If the disturbance which has caused the mortification continues, this change extends to fresh parts. The mortified portion has no clear boundary, or rather it is shaded off by a dusky red or livid border to the surrounding parts, which exhibit a deep-red colour. But, when it stops, a clearly defined line marks the limit of the dead portion. The neighbouring part then assumes a bright-red tint. A process now begins for separating from the living the dead portion or slough. There is a well-marked line between them, with a removal of particles constituting a superficial groove, which deepens more or less rapidly, and gradually extends throughout, so as to detach entirely or throw off the slough. Granulations arise from the exposed living structures in the groove, and are formed successively, in proportion as the detachment proceeds; so that a healthy granulating surface is seen when the slough is at last pushed off. What is the physiological explanation of this process? Is it ulceration, or absorption? Mr. Hunter, always inclined to ascribe great power to the absorbing system, regarded these processes as identical, that is, he considered the breaches of surface constituting ulcers to be the work of the absorbents, and this opinion has been generally adopted. Recently, and perhaps more correctly, ulceration has been deemed to be a modification of local death, in which the lost substance perishes in minute detail, instead of losing vitality in the mass as it does in mortification. There is no doubt on the point of repair, which is simply a specimen of healing by granulation and cicatrization.

As the separation extends through all the component textures when an entire portion of a limb has perished, the

loss of blood is prevented by its previous coagulation in the vessels, which extends considerably above the point of separation. Thus the femoral artery has been found closed by coagulum in amputation of the thigh for mortification of the leg. In amputating immediately below the knee for mortification of the foot extending above the ankle, I tied the three arteries of the leg, although they did not bleed. The time necessary for completing the separation varies, according to the size of the part and the nature of its component structures, from a few days to weeks or months.

The constitutional symptoms are very various. There may be none in some cases of small mortifications whether from external or internal causes, such as that of skin covering the tibia, from a blow, that of the thinned integument covering an abscess or an aneurism about to burst, or that of a toe in senile gangrene. As mortification is frequently preceded and accompanied by active inflammation, the general disturbance in those cases is the same as in inflammations. But, when the loss of vitality has occurred, the symptoms change; there is a remission both of the local and general disturbance. We observe the correspondence between the local and the general affection here as in other cases. Hence, when a considerable mortification has occurred, there is great depression of the vital powers. The symptoms assume the typhoid type, if we may use an expression which is rather indefinite. The pulse is feeble and intermittent; there are faintings, with a sense of languor and weakness. Cold sweat supervenes, attended with complete muscular prostration and subsultus tendinum. The sensorial functions become imperfect; there is either low delirium or stupor; the tongue is dry and brown. There is hiccough, with tympanitic swelling of the abdomen. There

is, in short, a complete breaking up of the constitution, announcing speedy dissolution.

The causes of mortification are numerous and various.

The essential nature of the process, under its several forms being a cessation of the vital movements in a part, we see it brought on by various agencies capable of disordering the circulation so as to cause its stoppage.

The following are among its obvious external causes.

1. Injury, which must be violent in degree, though it may be limited in extent, and if inflicted in that case on an unimportant structure, such as a bit of skin covering the tibia in a blow on the shin, is not a matter of consequence. In proportion as the extent of violence and the importance of the parts injured increase, there is greater suffering and danger. The latter reaches its highest degree in severe injury of a limb, where fracture or comminution of bones, with exposure or dislocation of joints, is combined with bruising and laceration of soft structures.

2. Pressure by the weight of the body on prominent parts, such as the sacrum and trochanters in long confinement to bed, or that of splints and other surgical apparatus. Pressure of bandages, when the limb swells after their application; hence the necessity of caution in using them where inflammation may be expected. They are hardly ever necessary.

3. Contact of animal fluids or solids in peculiar morbid conditions, or in particular states of decomposition. Under the name of malignant pustule, a formidable disease, proceeding rapidly to mortification, is known in the south of Europe, and is described by the writers of France and Italy, to whom it seems to be well-known. They speak of it as a local inflammation excited in butchers and others by contact with the blood or other fluids of animals perishing in particular

morbid states, or when overdriven oxen are slaughtered. It is also mentioned under the term charbon. An external inflammation soon goes on to mortification, extending rapidly, and often fatal.

I once saw this affection in a mild form occurring in a man who had been employed in Leadenhall Market, and had to overhaul parcels of hides from South America, which often arrive in a very bad state. One of them swept along his cheek, and he was aware that it touched the skin. The cheek, for an inch and a half in depth immediately below the eyelid, swelled and became red, as by erysipelas. This part having become shining and still redder, turned black. The slough, which involved the entire thickness of the cheek, separated slowly. From the considerable loss of substance, the cicatrix drew down and everted the lower lid.

It seems that horsehair imported from abroad sometimes reaches England in a foul state. I saw two healthy boys employed in a manufactory of this article, in each of whom there was a nearly circular black slough on the forearm, about the size of a shilling in one, and of a sixpence in the other. It occupied the thickness of the skin and the subjacent tissue, and was accounted for by their having handled the foul horsehair. The affection was completely local, and soon terminated by cicatrization after the slough had separated.

Sloughing primary syphilitic sores show the serious mischief that may be caused by a poison applied to the sound surface of a previously healthy person. The subject will be further considered under the head of syphilis. In sloughing phagedæna, which is indirectly connected with venereal disease there is a combination of ulceration and mortification produced by the local influence of acrimonious discharges. A similar combination is seen in hospital gangrene, as the effect

of a noxious atmosphere on wounds and ulcers. The two latter subjects will be considered under ulceration.

4. Cold, intense or long-continued.

5. Circumstances directly and seriously interfering with the circulation.

(*a*) Effectual compression or rupture of the principal artery and vein of a limb; ligature of the main artery in wound or aneurism.

The latter may entirely arrest the circulation and thus cause simple death; it may impede the supply of blood, causing paleness and coldness of the part, which may be removed by warmth and friction; or it may lead to the disturbance of circulation and consequent mortification, partial, or general.

(*b*) Interruption of the circulation, arterial and venous, by general pressure, such as that of the stricture in strangulated hernia. This produces distension of vessels, apparent stagnation of the blood, and deep discoloration of the affected parts.

(*c*) Interception of vascular supply, as an occasional effect of other disease. It is in this way that the thinned skin over an abscess or aneurism which has nearly reached the surface may lose its vitality, and that the integuments mortify over the cellular sloughs of phlegmonous erysipelas and carbuncle.

6. Violent inflammation.

These external causes do not produce mortification as their immediate and primary effect. They excite and disturb the circulation, inducing a degree of disorder which the parts are incapable of sustaining; hence the blood stagnates, and mortification ensues. The arrest of the circulation is owing in certain cases to the violence of the inflammation.

But mortification frequently occurs from a degree of in-

flammation not of the highest kind. In order to appreciate these cases, we must consider not only the local disturbance, but the previous state of the part, and the condition of the constitution. Either local or general debility, and more particularly the combination of both, constitute a great predisposition to mortification. The arrest of the circulation when a part is frostbitten, and still more if the skin should be frozen weakens the part to such a degree that it will not bear the influx of blood if suddenly warmed, but inflames and mortifies, while it may be perfectly recovered if the natural temperature is restored very slowly. The skin, weakened by constant pressure in long confinement to bed, easily inflames and sloughs.

Again, in weakened constitutions, slight causes, and apparently trivial degrees of inflammation may cause mortification. Thus, making scarifications, which are small superficial cuts, in anasarcous legs, in order to let out the fluid with which they are loaded, a practice altogether unnecessary, may cause not only painful inflammation, but even mortification. The application of blisters is still worse. I saw a patient in an advanced stage of dropsy, in whom a blister had been placed on the calf of each leg. The entire surfaces mortified, thus terminating existence prematurely by a painful death.

Andral has recorded a similar fatal occurrence in a female aged forty-three, in whom organic disease of the liver, stomach, pancreas, and omentum existed, and who was extremely emaciated and weak, with vomiting, constipation, small, and frequent pulse; hot and dry skin. Blisters were applied to the legs; violent pain, and extreme agitation, were produced, followed by prostration. The vesicated surfaces were covered by a black stratum, and the patient died in two days from the application. (Andral, 'Clinique,' iv, 461.)

I have seen mortification of a blistered surface brought on by dressing with savine ointment in young and weakly children more than once. Indeed, this remedy should not be resorted to at all in young subjects without great precaution as to the size and power of the blister, and the duration of the application.

Internal causes.—An unsound state of constitution, induced and maintained by indulgence of appetite and inactivity, constitutes a predisposition to attacks of inflammation, and even mortification. The effect is too obvious to escape notice, when bad habits are carried to excess. But the same influences in a minor degree, such as may not appear to pass much beyond the bounds of prudence, especially if accompanied by indolence, may, in the course of years, gradually undermine the powers of the system. The mischief proceeds so slowly as to escape the notice of the individual until his attention is roused by an attack of disease. The most trivial injury, especially to a part remote from the centre of circulation, such as a superficial cut on a toe, may cause mortification under such circumstances. Is the real cause of the mischief here in the local injury, or in the unsoundness of constitution? How is the matter to be explained, if, as not unfrequently happens, a black spot appears spontaneously on a toe?

The habits now alluded to may, by long continuance, so disorder and weaken the most important internal organs, as to cause great general debility favorable to the occurrence of spontaneous mortification, or to its occurrence from a local injury.

A strong predisposition to spontaneous gangrene originates in an imperfect state of the circulation, caused by disease of the arteries. The coats of these vessels, not only in the trunks, but in the ramifications as far as we can trace them,

are in great measure ossified, or, as some contend, calcified. The earthy matter, which is phosphate of lime, is deposited in variety of forms and of extent, generally in thin plates or scales, first, perhaps, in the internal or serous coat, but ultimately involving the whole substance of the vessel. At first small and distinct, they increase in size, and come nearer together, so as to occupy the whole tube for a considerable extent. They may convert the vessel into a completely hard and rigid canal. The deposit sometimes encroaches on the cavity so as to lessen or entirely obstruct the calibre. This state of the arteries, which must lessen the quantity of blood received by a part, and interfere with its proper transmission, may be found in the healthiest persons, who have attained great age, and led regular lives, and may manifest its injurious influence in them; occurring at an earlier age, and in unsound constitutions, it cannot fail to be more hurtful. Our knowledge of this disease as a cause of gangrene is almost confined to the lower limbs. In a patient under my care in St. Bartholomew's, in whom a great toe had been slowly yielding to the malady during some months, I found the radial artery on both sides hard and pulseless.

The late Baron Dupuytren contended that spontaneous gangrene of the lower extremities arises, not from ossification of the blood-vessels of the part, which he regarded merely as a casual coincidence, but from inflammation of the femoral artery, causing effusion into the tube, and its consequent obstruction. According to my experience, these cases of arteritis are extremely rare; and the very small number that I have seen, have been in younger persons than those attacked by the usual form of spontaneous gangrene. They have been attended by unequivocal evidences of disorder in the course of the main artery, from which the

others are entirely free; while the beginning and progress of the affection have been altogether different in the two cases.

Internal causes, of which the nature and operation are unknown, may render persons more liable to mortification. An example is afforded by the use of spurred rye for food, the pernicious effect of which is not unfrequent in the north of Europe, though almost if not entirely unknown in England.

Prognosis.—Mortifications from external causes, of small extent in unimportant parts, such as the skin, are of no material consequence. Even if the injury were a little larger and deeper, it would probably not be dangerous under judicious treatment. In other cases, whether from external or internal causes, the affair is serious, often most dangerous, involving, more immediately or remotely, loss of limb or of life. Mortifications from internal causes are more dangerous than those from external. In the former the constitution is in fault, and we may expect that the mischief will spread, return after it has once been arrested, or show itself elsewhere; in the latter, the affected part is concerned only, or at least chiefly. The mere local changes are no criterion of the danger; their extent affords no measure of the risk to life.

An Irishman of middle age was brought into the hospital from a workhouse in Islington. He had received a slight injury in the shin and had neglected it. Pain and swelling came on, preventing him from following his occupation, that of a labourer, and he was received into the workhouse, from which it was soon deemed necessary to transfer him to St. Bartholomew's. The left lower limb was in a dangerous condition in nearly its entire length, the foot and leg being swelled, and bright red, with mortification from knee to ankle,

from four to six inches in breadth, the integuments in this space being perfectly black. Vivid redness, with some swelling, extended along the inner half of the thigh to the groin. The circulation was extremely depressed, but the aspect of the countenance not altogether unfavorable. He was placed in a warm bed, and a glass of warm brandy and water administered without delay, the limb being enveloped in a soft poultice. He was able to take beef tea in the evening with repetition of the stimulus, and an opiate was administered at bedtime. Having passed a good night, he had a better pulse the next day. He looked at the limb with perfect coolness, and apparently without alarm. Under the influence of a generous diet, with stimuli and bark, the restorative processes went on favorably, and he left the hospital quite well in a few weeks.

A small black spot on the toe of a free liver, with a bulky frame and red face, would be a more alarming affair than the case of the poor Irishman. It would clearly proclaim an unhealthy state of constitution; it would be an outward and visible sign of inward unsoundness. In forming our prognosis, therefore, we must consider not merely the extent of the local mischief and the importance of the affected part, but also the cause of the mortification, and the state of the constitution.

Treatment.—No one plan can be universally applicable in an affection like mortification, which may occur at all ages, in all kinds of constitutions, and in all conditions of health; in a diseased process, of which the causes and progress are very various, being sometimes unattended with risk, at others most dangerous to life, or even inevitably fatal. The general indications are—

1. To prevent its occurrence.
2. To arrest its progress, and combat particular symptoms.

3. To favour the separation of the mortified part, and, in certain cases, to accomplish that separation by a surgical operation.

1. The means of prevention differ, according to the nature of the case. They include proper treatment of inflammations, and judicious management of frostbitten parts.

2. The practice formerly prevailed, and is not altogether obsolete, of attempting to stop the progress of mortification by various warm and stimulating applications considered to have the power of preserving and restoring the heat of the part, or by others supposed to be capable of preventing putrefaction, and therefore called antiseptics; for instance, spirits of wine, turpentine, balsams, camphor, bark, yeast and beer in poultice. These substances prevent or retard putrefaction in dead animal matter, and they have been employed in mortification on this false analogy. The application of conclusions drawn from the action of certain matters on dead textures, to the employment of these agents on the living frame, are equally false in physiology and logic. Alcohol, oil of turpentine, and camphor, may have some effect in lessening the fetor of the mortified parts; but their stimulating action on the living structures, already too highly excited, would, in most instances, hasten instead of retarding the progress of mortification.

For the purpose of correcting fetor the best applications are charcoal and the chlorides of lime and soda. Finely powdered charcoal absorbs the noxious and offensive effluvia of dead and living animal matter as well as carbonic acid gas, and is thus employed with advantage in places where animal decay is going on. A bread poultice, with admixture of powdered charcoal in sufficient quantity to make it quite black, is one of the best applications, not only in many cases

of mortification, but in all phagedenic and sloughing ulcers.

The chloride of lime exposed in flat dishes is in domestic use as a disinfectant, and will sweeten the air of an apartment. A solution of this, and also of the chloride of soda, is sold under the name of bleaching and disinfecting liquids, and they appear in the London Pharmacopœia under the names of liquor calcis chloridi, and liquor sodæ chlorinatæ, respectively. When properly diluted, they may be sprinkled on external dressings and bed-linen to destroy offensive smells.

Although charcoal and the chlorides are perfectly efficacious in destroying unpleasant effluvia and in preventing the progress of putrefaction in the altered part, they do not, I believe, impede the extension of the process; that is, they are not to be regarded as antigangrenous in the proper sense of the word.

Applications to the part which has perished are obviously unavailing, while incisions for the purpose of allowing remedies to reach more deeply, could not be otherwise than injurious. If the surrounding structures are still actively inflamed, soothing local means, with appropriate general management, will be most likely to check the progress of the mischief.

The internal treatment has too frequently been directed by the same views as the external, and has consisted in the free use of stimuli, of cordials and tonics, more particularly bark, and of full diet. Bark, long supposed to have sovereign powers in gangrene, is now found to have no such influence. In many cases tonics and stimuli with strong diet are obviously inadmissible. Mortification may occur in states of general power not only different from each other but almost opposite in character.

There may be a full pulse, with heat of skin, costiveness, thirst, and a white tongue. The indication here would be obvious, to clear the alimentary canal, restore the secretions, and enjoin a light, simple, and unstimulating diet. On the other hand the pulse may be feeble and failing, the powers of life giving way at all points, and a state of prostration approaching, with the prospect of speedy dissolution. In such a crisis, or rather at an earlier stage, the only chance of safety is in rallying and maintaining the circulation. Our great dependence must be on brandy or on wines of the most cordial quality, with such strong fluid nourishment as the stomach will bear. Bark in its most concentrated form, with other cordials and stimuli may have place in the treatment.

If the patient's health is in a satisfactory state, the separation of the dead part will go on very well under an ordinary poultice of bread or linseed. The charcoal poultice has the advantage not only of destroying fetor, but of producing a healthy condition of the new granulating material which accompanies and follows the detachment. If the restorative process should appear inactive, strips of lint moistened with balsam of Peru, or spread with resin ointment, may be placed on the granulating surface under the poultice. Powdered camphor has been recommended for the same purpose. Poultices made with linseed or oatmeal and yeast, or stale beer are sometimes employed. I have often seen the yeast applications successful where others had failed.

Amputation may be necessary or advisable when a portion of a limb has mortified; and two questions occur for consideration—1st, what are the circumstances under which an operation should be resorted to? and 2nd, what time should be chosen for its performance?

It has generally been regarded as a universally received

rule that amputation should not be performed until the boundary between the dead and living parts has been clearly established. This would seem to imply the converse proposition, namely, that when the limit has been unequivocally marked out the operation might be safely resorted to. Both these propositions must be abandoned. If the first rule were followed, lives would be sacrificed when an operation might be undertaken with reasonable chance of success; according to the second, operations would be undertaken in many instances when an unfavorable result would be almost certain. In reference to these remarks, which will be further illustrated in speaking of traumatic and of spontaneous gangrene, it will not escape attention that the cause of one is local, of the other constitutional.

If in a spontaneous gangrene of the lower extremity the disease should have stopped in the leg, and if the soft parts should have firmly cicatrized, the projecting bones may be sawn through in order to remove the nuisance of the decayed parts, taking care not to injure the cicatrix.

Mortification from *frostbite*, rarely seen in this country, is common in the northern parts of Europe, especially in Russia, and in other equally cold regions.

Cold has the same effect locally and generally, enfeebling and at last arresting circulation; the effect is seen in the extremities of the body, for instance, in the hand; fingers become livid, white, cold, and benumbed. The parts are then frozen. By gradually thawing them, circulation is restored. The only danger is in precipitation, in the too free use of warmth and stimuli. The frozen parts are to be rubbed with snow or iced water. By exposure in a very low temperature, the nose, cheeks, and ears are frozen, the persons not being aware of the change until warned by

a friend who notices the deathy whiteness of the affected skin.

Treatment.—If inflammation should have been produced, with swelling, redness, heat, and great pain, the usual antiphlogistic measures may be employed according to the violence and extent of the local symptoms. Let it be observed, however, that during the siege of Sebastopol frost bites were extremely common among the men at work in the trenches. The surgeons there found that in all instances positive evil ensued by surgical interference of any kind. The mortified parts were allowed to separate.

Traumatic gangrene.—All mortifications excited by direct violence come under this term; the slighter cases are unimportant. But when mortification follows from local injury of the more serious kind, attacking at once an entire division of a limb, and rapidly spreading to the trunk, the affection is of the greatest consequence, and may decide the patient's fate in a few hours. It comes on in consequence of injuries attended with violent and extensive bruising and laceration, with injury of vessels and ecchymosis, especially when complicated with fracture or dislocation; in bad gunshot injuries, and compound dislocations. Severe pain occurs in three or more days after the accident; the limb swells, loses its natural colour and temperature, and becomes cold. It is variously discoloured, greenish, livid, blackish. The cuticle is loosened or raised by effusions of turbid reddish fluid. The cellular texture is loaded with a yellow or bloody serum. The mortification rapidly reaches the trunk. Larrey, who had seen it principally in consequence of gunshot injuries, has known this to happen in six hours.

The only question in such a case is whether immediate amputation offers any chance of saving life: if we wait until

the mortification stops, and the line of demarcation between the dead and living parts occurs, the patient surely dies; for this mortification does not become limited. In deciding on this point, we have to consider, not only the state of the part, but also that of the constitution. In an unhealthy habit a slight injury may cause traumatic gangrene, which is owing in such a case to the badness of constitution rather than to the local mischief. Such a constitution would form one of the most cogent reasons against the operation.

On one occasion I saw a stout man of large frame, employed as a drayman in the brewery of Messrs. Whitbread. A few days previously he had grazed the shin, and regarding the hurt as of no consequence he had continued at work, when violent inflammation came on, and in about three days mortification had nearly reached the trunk. In an individual in whom so serious an effect could be produced from so slight a cause, amputation would be out of the question.

I was once sent for to see a gentleman without being aware of the nature of the case that I should have to witness, and on entering the room I was much surprised with the look of the patient. He began to speak, but he appeared as though he could hardly articulate. I put my finger on his pulse, and found it sinking. The hand was cold, and I then found he had an affection of the other arm, which I was desired to look at, and when it was opened, to my great astonishment, I found the forearm mortified. It was cold, livid, and discoloured, and the process of mortification was extending up the arm. On inquiring what had occurred in this case, I found that the patient was not aware of any other cause except that a person passing him in the street had accidentally struck him upon the elbow a few days

before. The part became uneasy; it swelled, and he sent for a medical man, who despatched his assistant, and he applied some leeches. But the medical practitioner, by whose desire I was requested to see the patient, had not seen him until a few hours previously. It is obvious that, under such circumstances, amputation was out of the question. In the feeble state to which this person was reduced, the mere operation would have been sufficient to extinguish life, and in fact the patient died within twenty-four hours of my visit.

Many years ago an Irishman was brought to this hospital, who had fallen from a scaffold three stories high. He did not fall direct to the ground, but from the third story to the second, from the second to the first, and from thence to the ground; however, he received a severe injury of the wrist. I was at the time an assistant-surgeon to the hospital, and, being in the ward accidentally about midday, was requested to see this patient; it was about three or four days after his admission. On the preceding night, at bed-time, the dresser under whose care he was had left him well; for he had seen him late, and he ascertained that he was then well. In the morning the patient told the nurse that he had been in a dreadful state of pain all night; she came to the dresser, and at his request I went to see him. I found the fore-arm, from the wrist up to the elbow, enveloped by a bandage, which might not have been, when applied, tighter than was proper; but in consequence of the limb swelling, it had become too tight. The hand was quite dead. The fore-arm was livid and cold up to the elbow; the upper arm in its lower part was not, perhaps, actually dead, but in a state of impending mortification. The discoloration of the skin reached as high as the shoulder, and this state of the limb had come on in twelve, or at the utmost fifteen hours. Now

this was a stout young Irishman, of excellent constitution, and therefore a fit subject for an attempt to save life by an operation; and although the integument was not in a perfectly satisfactory state where it was necessary to amputate, I thought I would give him a chance. I removed the arm at the shoulder joint, the cellular membrane being discoloured and infiltrated with a yellow fluid in the part where the incision was made. The case succeeded perfectly, and the patient reovered.

I have seen other instances in which amputation has been successfully performed in traumatic gangrene before mortification had stopped, and consequently before the line of demarcation had taken place between the dead and the living parts. Several such cases are recorded by Larrey, in his "Memoirs of Military Surgery;" and of late years there has been an accession of evidence on the same point; so that I have no hesitation in saying that in patients of healthy constitution, where gangrene arises from external causes simply, you must disregard the rule of waiting for the line of demarcation.

Senile Gangrene. — Such is the name under which an affection of common occurrence is now universally known, although our great surgeon, Pott, to whom we are indebted for the first distinct account of the subject, which, although short, is so clear, rational, and judicious, that it has not yet been surpassed, so far from having employed the epithet *senile*, observes simply, "It frequently happens to persons advanced in life, but is by no means peculiar to old age." It is a form of dry or chronic mortification, and is frequently spoken of as spontaneous, a character which belongs to it in the great majority of instances. Mr. James, of Exeter, a pupil of St. Bartholomew's, speaks of it under the appropriate designation of *chronic sphacelus*, in his valuable and

interesting observations "On the Causes of Mortality after Amputation of the Limbs," in the 'Transactions of the Provincial Association,' vol. xvii.

It is a mortification speedily following an inflammatory disturbance, of so slight a nature that it not unfrequently escapes notice altogether, the discoloration of the part being the first circumstance that attracts the patient's notice. A dark spot is seen at the end, or on the inside of one of the toes, generally the smaller ones. Sometimes it begins on the great toe, occupying the plantar surface of the last phalanx. It may begin on the foot; I have seen it on the heel, and once in the middle of the sole. The cuticle is loosened, and raised into a vesication, becoming whiter and opaque, with a sodden appearance when thick, as on the plantar surface of the toes or foot. A puncture lets out a bloody fluid, and the skin is seen deep red, or more frequently livid, brownish or black, in short mortified. It soon becomes dry, hard, and shrivelled. Sometimes it begins and proceeds with little or no pain. I have seen a large vesicle occupying the entire plantar surface of the last phalanx of the great toe, and in another instance one of similar magnitude on the heel, when the patients were hardly aware that anything was the matter, and yielded unwillingly to the necessity of confinement in bed. In other cases uneasiness more or less considerable is felt in the whole foot, particularly in the night, and even before any visible change, or with merely a small discoloured spot.

The affection generally proceeds slowly, and sometimes very much so, destroying a toe and stopping, then subsequently attacking other toes after an interval. Sometimes it goes faster from toe to toe, then to the foot, and even to the leg. There is previous swelling, with redness, lividity, and great pain, then loosening of the cuticle, and morti-

fication. Sometimes the mischief extends along the sheaths of the flexor tendons into the sole with great suffering. The constitution, at first unaffected, sympathises seriously, and the patient sinks under the extension of the mischief.

This affection does not always terminate fatally. The slough of the toe or heel may separate slowly, leaving a healthy granulating and cicatrizing surface, leading to a sound cure. Thus a gentleman nearer to eighty than seventy experienced without any suffering mortification of the entire plantar surface of the last phalanx of the great toe. It healed well under confinement to bed, and there was no return of mortification during the two or three remaining years of life. Another gentleman of sixty-one, who had lived well, and was rather corpulent, with a reddish face, had a slough form at the side of the heel, twice as large as a shilling, without pain or any assignable cause. By confinement to bed for two months, to which he submitted at first very unwillingly, mild diet, and poultice, the slough separated slowly, followed by healthy and sound repair. I saw him at the end of six months in perfect health, when he felt himself better than he had been for many years. The cicatrix of the heel was covered by a hard dark crust, the foot being then as well as ever. I saw him again in good health at the end of four years from the original attack.

I attended a gentleman under sixty, of robust frame, and strong health, with an attack of pain and swelling in the upper part of the back, between the scapula and spine, which soon proceeded to suppuration not of violent character. It healed kindly after the discharge by a free puncture of several ounces of healthy pus. Not long after mortification occurred in a toe of one foot, extending gradually but very slowly to the other toes and subsequently along the foot to the ankle, where it stopped. The dead parts separated by the natural

process leaving the astragalus in its place, and at the end of many months the whole had cicatrised, and the health, which had not failed much, was quite restored. The pain, which had been slight in the beginning, gradually became so severe as to require the free use of opium. The patient was now able to take long drives in an open carriage, which he enjoyed greatly, much care being taken of both limbs, especially in regard to position and covering. In less than a year disease of the same character, but more rapid course, in the other leg, carried the patient off in a comparatively short time. This patient had been in the habit, for a long course of years, of indulging himself in eating and drinking to an enormous amount, not, however, to an immediately injurious extent in the latter respect. To my great surprise, I found that he had borne this large quantity of ingesta well, so as to have enjoyed good health, till the mortification came on, although he had not taken any great exercise, and had spent much time in confined apartments and bad air.

An example of more active disease, proceeding rapidly, yet apparently referable to the same head, was afforded by a lady, about fifty, the widow of an ale-brewer, who had lived freely, and generally had a white tongue. She began to suffer pain in the middle toe of one foot, and paid no attention to it till it had lasted some weeks. When I saw her, the entire toe was swelled, red, and excessively painful. A ragged sloughy hole was observed on one side, yielding an offensive discharge and leading to the bare bone. There was a foul tongue, with great pain, flushed countenance, and expression of illness and anxiety. The inflamed toe perished, and then the others, death occurring in about a month from my first seeing her.

This affection is much more frequent in men than in women. "For one female," says Mr. Pott, "in whom I have met

with it, I may say that I have seen it in at least twenty males."

Causes.—The disease is most common in those who have been free livers. To this effect, Mr. Pott observes, "I have much more often found it in the rich and voluptuous, than in the labouring poor, and more often in great eaters than in free drinkers." It happens, however, not infrequently in old and healthy persons, who have led a regular and temperate life, depending on the diseased condition of the arterial coats which has been already mentioned. Mr. Pott's excellent practical tract shows that inquiries into morbid changes after death had not begun in his time. In speaking of causes, he says, "It has by some been supposed to arise from ossification of vessels; but for this opinion I could never find any foundation but mere conjecture." The view of this subject taken by Baron Dupuytren has already been alluded to on a previous occasion. Regarding the affection as proceeding from inflammation of the arteries, he calls it "gangrene symptomatique," observing that it may occur where the arteries are not ossified, and not follow where they have undergone this change. He describes the arterial disease as being preceded and accompanied by severe pain in the limb, and indicated by local changes, such as diminished pulsation, diminution in size of the vessels, and hardness of the tubes, which point out the seat and nature of the affection. He describes the changes produced in the vessels as ascertained by dissection, particularly their obstruction by lymphatic concretions to a considerable distance from the mortified part. The writings of Mr. Pott, and the rational mode of treating senile gangrene followed in England in conformity with his valuable experience and instructions, seem to have been unknown to Dupuytren, or ignored by him, although fifty years had elapsed from the death of our great surgeon. Thus, he con-

fesses that he had pursued the old routine, both of external and internal remedies, for fifteen years, the cases whether of arteritis or ossification constantly getting worse under their influence. At length, light broke in upon him from a patient in the Hôtel Dieu, a female between sixty and seventy, with senile gangrene affecting the toes of the left foot, preceded by long and severe pains, which had prevented rest for several months. The ends of the toes were mortified and dry, the neighbouring part of the foot swelled and livid. During several weeks, bark and opiates were used both internally and externally, without effect. The mortification spread along the toes, and the sole and back of the foot. M. Dupuytren having found the pulse full and strong, and the face red, ordered venesection. The pain ceased, sleep was restored, and the mortification stopped. At the end of a fortnight the bleeding was repeated, and it was had recourse to whenever the symptoms returned. The patient recovered. Since that time, says M. Dupuytren, we have employed repeated bleedings with the effect of relieving and curing two thirds or even three fourths of our patients ('Leçons orales,' vol. iv—'Dictionnaire de Médecine,' p. 10.

Although I have seen a few instances in which great pain of the foot with constitutional disturbance has been effectually relieved by venesection, I regard such cases as exceptional, and cannot consider repeated bleedings to be a proper general mode of treating senile gangrene. Mr. Pott's plan of employing opium answers admirably when the pain is severe, as the remedy thus administered gives ease and rest without disturbing the head or stomach, or causing costiveness. When there is no pain, opium is unnecessary. The diet should be nutritious and light, without stimuli, the latter being allowed occasionally. To urge on the patient full animal diet, with free use of stimuli, is a relic of the ancient injudicious routine.

It is advantageous to cover the whole limb from the toes to the knee, kept in a horizontal position in bed, with carded wool, which maintains an uniformity of temperature, and is thus especially serviceable if the circulation should be feeble. A dry and shrivelled toe, or piece of skin, may be wrapped in a bit of rag thinly spread with fresh lard or simple cerate, which need not be changed so long as there is no discharge. When separation commences, a soft linseed poultice may be applied, and removed when necessary by opening the lower part of the wool without uncovering the rest of the limb.

The question of amputation will come under consideration in some cases of senile gangrene. The opinion of experienced surgeons has been so adverse to the operation as almost to have established a positive rule against its performance, grounded on the belief that from the unhealthy state of constitution to which the origin and extension of the mischief must be referred, destructive action may be expected in the wound instead of healthy repair. The cases of this disease may be arranged in two divisions; the one including those where the fault is altogether in the constitution, the other where the constitution and health are sound, the disease depending on the state of the arteries. Mr. James, of Exeter, in the paper already quoted, has ably argued the question in favour of operating in instances of the latter kind, and has adduced the conclusive evidence of six cases in which amputation had been performed with perfect and permanent success, either in the thigh or leg, for senile gangrene in old and otherwise healthy persons.

An herpetic mortification is sometimes seen in the legs of elderly and generally enfeebled persons. It begins with vivid redness of the skin, quickly passing into superficial mortification, the whole process being generally very painful. It may extend along one edge, separating and healing at the other.

The slough may separate entirely, the exposed surface granulating and cicatrizing rapidly. We suppose a cure is at hand, but the mischief reappears and spreads. It came on from an accidental injury to the shin in a gentleman of seventy of indolent and studious habits, fond of indulgence in diet, and rather corpulent. It extended considerably, healing in the parts first affected, but got well by rest in the horizontal posture with regulated diet. In a female of seventy-two, the affection, seated in the leg, began with bright redness of the skin and then slough, the latter separated and the parts healed; she seemed well, but sloughing recurred, at last going deeper and proving fatal at the end of several weeks. The pain was most severe in this case, requiring large doses of opium and the liquor sedativus. The latter was useful as a local application, proving sedative in that form. Quinine and port wine were the most advantageous remedies, purgatives being required and used with much advantage, when the narcotics were freely administered.

I saw a gouty gentleman of sixty-five who had been a free liver, and accustomed to strong exercise, which he had latterly given up, at the same time living low. He was thin, sallow, and feeble; the feet and legs rather œdematous and red; on one leg, a little above the ankle, there was a portion of dead skin about an inch long and half as broad, dark and livid rather than black, without surrounding redness; on the other leg, below the ankle there was a watery vesicle the size of a bean. The feet and legs had been hot and painful at night, but not in the day. The treatment included the horizontal position, bread poultice, good diet, with four or six glasses of wine and mild aperients. The pain at night was immediately relieved. The skin under the vesicle sloughed and separated, the larger mortified portion in the other leg came away slowly, and the patient returned to the country in three weeks,

perfectly well. If the disease had not been attended to early in this case, it might probably have assumed the herpetic form.

Under the names of cancrum oris, nomas or nome from the Greek νεμω, depasco, and water canker, a foul phaganteric ulceration, with fœtid discharge, is described, attacking the mucous membrane of the lip or cheek in children, spreading through the intermediate textures, and causing a black slough of the skin. The latter is first swelled and hard, then becomes red, and soon turns black. It attacks children of the lower class, especially those of weak constitution, in whom the powers of the system have been lowered by bad food and clothing, but it is not entirely confined to such subjects. If the disease of the mucous membrane does not exceed the size of a sixpence, the slough of the skin being about equal to a half-crown, the progress of the mischief may be stopped by an effectual application of the strong nitric acid both internally and externally, under the influence of chloroform, by bark and wine, with strong beef-tea, and perhaps an opiate at night. When the mischief is more extensive, there is little chance of saving the patient. If the affection, though more extensive, has not penetrated beyond the mucous membrane, ulceration of similar character in the gums round the necks of the teeth being combined with it, a strong solution of lunar caustic to all the morbid surface may suffice in lieu of the acid. Chlorate of potash may be combined with the bark, or substituted for it, and the same diet is required as in the preceding case.

CHAPTER XI.

WOUNDS.

These are seen under great variety, in the nature and extent of the injury, the concomitant circumstances, the mode of treatment, and the result. They may be conveniently considered under the following heads; namely, incised, lacerated, contused, punctured, and poisoned wounds, the latter generally very slight in themselves, being complicated by the introduction of irritating or poisonous matter at the breach of surface.

1. Incised wounds or cuts, being simple divisions of the soft textures of the body by cutting instruments, include the great majority of surgical operations, which, generally speaking, require only the same local management as incised wounds produced in other ways. Mankind seem to have arrived at all times, by a natural instinct, at the right mode of treating cuts, which is practised throughout society as a familiar piece of domestic surgery. The edges of the cut are brought together by some adhesive plaster, or by a rag wrapped round the part, which is kept quiet, and the injury is remedied without pain or discharge. If an ignorant person who had taken this course should be informed that he had healed the wound by the first intention, he would probably be surprised at the discovery that he had performed so scien-

tific a process. As the edges of wounds, when thus approximated, quickly stick together, we call the process union by adhesion, which is exactly equivalent to Galen's expression, "per primam intentionem," or the French phrase of "réunion immédiate." This simple method of treating wounds, according to the dictates of common sense, appears to great advantage in comparison with the precepts and practice of the learned, who have laid down the rules of art on the subject, prescribing a cumbrous and complicated mode of dressing, including variety of ointments, pledgets, masses of lint or charpie, compresses and bandages. This course, which has been obsolete in England for the last three quarters of a century, still flourishes in all its complexity throughout a great part of the Continent.

The explanation of the process by which wounds are thus healed, is that the surface of the wound soon becomes covered by a closely adhering substance, which in appearance and other properties exactly resembles the fibrine of the blood. This fibrine, of which Dr. John Thomson* found, in experiments on animals, a distinct layer covering the wounds he had made within less than four hours after they had been inflicted, agglutinates the sides of the wound, making them adhere so effectually that at the end of ten or twelve hours they cannot be separated without force. This medium of union is soon penetrated with blood-vessels, and thus becomes organized. The shortest time within which this organization can be accomplished has not been ascertained, but simple wounds are often found firmly healed at the end of two or three days. The medium of union must be poured out by the capillaries of the part; it cannot be an effusion from divided vessels, as it is effected most advantageously when the wound is perfectly dry before being closed.

* 'Lectures on Inflammation,' p. 209.

The union is not effected by blood, Mr. Hunter's notion on this subject being now considered erroneous. The presence of coagula, although it may stick the sides together for a time, prevents adhesion. In reference to this object, blood is a foreign body, and ought to be carefully removed before the sides of a wound are approximated. This effusion of fibrine is seen under the five following circumstances, and, so far as the nature of the substance is concerned, the process is essentially similar in all. 1. Union by adhesion, or the first intention. 2. As the commencement of healing by the second intention, or granulation. 3. In inflammatory swelling of a part. 4. In the walls of an abscess. 5. In inflammation of serous membranes.

That state of a part in which fibrine is thus effused was called, by Mr. Hunter, adhesive inflammation. Objections, not altogether unfounded, have been made to this generalization, which, although in itself interesting, unites the healthy process of adhesion, by means of a common name, with the morbid state of inflammation. Under favorable circumstances, the sides of a wound are agglutinated without any observable vascular disturbance; without swelling, redness, heat or pain, that is, without any of the usual characteristics of inflammation. The supervention of inflammation prevents adhesion. Effusion of fibrine is not the result of any peculiar kind, but rather of a certain degree of inflammation. Differences of texture, however, produce difference in this respect; thus, effusion of fibrine, which occurs most easily in serous, is difficultly excited in mucous membranes. All the softer textures of the body are susceptible of union by the effusion of fibrine, as we see constantly in skin, cellular membrane, muscle, tendon, nerves, coats of intestine. Broken bones grow together more slowly on account of their hardness, but the process is not essentially different.

The uniting medium, which first agglutinates, assumes the nature of the structure in which it is deposited, and the part is restored to its former state and functions, as is seen in skin, muscle, tendon. The power of a nerve, lost by its division, returns when the continuity of the cord is restored. This union by adhesion is observed, not only in simple division, but where parts have been nearly detached, as in flaps of scalp, an ear or finger almost separated. In all such cases union may be accomplished, if very slight connection only remains; there is even some evidence that portions of skin entirely separated have become adherent. The power of union by adhesion is illustrated by the surgical proceedings for the restoration of lost or mutilated parts, and by animal engraftings.

The practice of making what have been called artificial noses, but in reality that of transplanting a portion of integument from the arm to the face, was carried on at Tropea, in Calabria Oltra, in the 15th century, by a family named Boiani. Two Sicilian surgeons, father and son, named Branca, were celebrated in the art at the end of the 15th century.

Tagliacozzi, professor at Bologna, who had learned the process from the Calabrian operators, practised it, and has described it at great length, in his elaborate folio of 300 pages, 'De Curtorum Insitione per Chirurgiam,' with numerous plates, 1597. The noses made by Tagliacozzi were seen by many of his contemporaries, who have attested the facts. He also made ears and lips. A statue was erected to him at Bologna, in which he is represented holding a nose in the hand. He pared away the callous edge of the cicatrix, raised a flap of skin of proper size and form, from the arm or forearm, leaving it connected at the part intended to form the top of the nose, bound the arm to the head, then fastened

the partially detached flap to the pared edge of the old nose by sutures, and completing the separation when the circulation had become established. That he succeeded in this way, in making a portion of skin from the forearm adhere to that of the face, and thus in covering over the chasm left by the loss of the external nose, we can easily admit; but a stronger degree of faith is necessary in order to believe some other of his statements, viz., that the new noses smell more acutely than the original, and grow larger and stronger, also that hair grows on them so abundantly, that they require shaving.

The Asiatic method of restoring the nose by means of a portion of skin from the forehead, is described in the 'Gentleman's Magazine,' for 1794 (October). Duhamel, in the 'Memoirs of the Academy of Sciences,' 1746, mentions that it was a common practice in the poultry yards of France to engraft the spurs of young cocks on their combs. He did this, and in many instances they became adherent, and grew, even to the length of some (4) inches. This fact was verified by Mr. Hunter, and the result of his experiments may be seen in the Museum of the Royal College of Surgeons.

It is reported that new noses have sometimes been made in India with a portion of skin cut from the buttock, but we have no clear and authentic statement on the subject. Professor Bünger, of Marburg, employed a similar operation on a female, in whom the prominent part of the nose had been lost, and the neighbouring skin was in an unhealthy state from herpes. He took the skin from the upper and outer part of the thigh, employing this operation because a larger piece of skin was required than he could procure from the forehead. He cut a piece four inches long and three wide. An hour and a half elapsed before he could close the sutures. Union took place, and the skin retained its vitality, except

at the lower edge, where a portion perished. ('Gräfe u. Walther's Journal,' B. iv.)

A portion of the cranium of a dog was removed with the trephine by Merrem and replaced, the integuments then closed. The bone united. He did the same in a cat. Professor Walther repeated the experiment in a dog, which was killed a year after. The piece was firmly united; the cranium is in the Museum at Bonn, and is figured in Wiesmann, 'Commutatio Physiologica de coalitu partium,' &c. &c., Lipsiæ, 1824, which contains a complete collection of facts relating to this subject.

The following remarks on the treatment of wounds are equally applicable to those made in surgical operations. The objects are to promote adhesion, and to keep off inflammation. The edges of the wound must be brought together and kept in contact. The means of doing this are, 1. Adhesive plasters; 2. Sutures; 3. Bandage; 4. Attention to position.

Formerly sutures were almost universally employed; in the present century they have been superseded to a considerable extent by adhesive plasters, strips of which should be used just sufficient in number and length to bring the sides of the wound together, and to keep them in apposition. It is not necessary to cover the entire surface of the wound. Recollect that these plasters are in themselves irritating, and would probably excite some inflammation and uneasiness if put on an uninjured part. Remember that the occurrence of inflammatory swelling in some degree is probable, when the plasters become tightened, and thus aggravate the mischief. It is of no use to drag the sides forcibly together, when there has been loss of substance; either the plasters give way, or remaining firm, cause inflammation and pain. The part should be left open or covered as lightly as possible. A

linen rag twice folded, dipped in water, and squeezed, may be applied if the coolness is agreeable. If no inflammation occurs, the plasters may be left for three, four, or more days, and then renewed, if it should seem advisable; generally a simple damp cloth is sufficient. If the plasters are rendered stiff and uneasy by blood which has become dried, they should be removed earlier: this may be done at the end of twenty hours if necessary. If the edges are red and painful, and union has been only partial, that is, if inflammation has occurred, damp cloths, or a thin and soft bread poultice will be preferable. Sutures are employed either alone, or in conjunction with adhesive plasters in the form called interrupted, which consists of separate stitches. They are necessary where the integuments are loose and folded, as in the scrotum or neck, or where moisture might detach plasters, as about the mouth. The sutures should be made with sharp needles and small ligatures; for instance, a single stout silk thread, such as would be used in tying arteries. The number of stitches should be such as will bring the edges of the wound together, and maintain them in apposition. The two methods may be used in different parts of the same wound.

The sutures may be cut out, if there is no reason for retaining them, in twelve, twenty-four, or more hours; that is, when they have kept the parts together sufficiently long for the purpose of union, and before their presence can have excited inflammation. If the sutures should be put on the stretch by inflammatory swelling of the parts, they should be removed at once. Recently slender metallic wires, of silver or iron, have been employed for surgical sutures in preference to threads of silk or other material. They answer the purpose perfectly well, and do not cause the slightest irritation in the textures through which they pass; in this

respect there is no great difference between the metallic sutures and small, firm, silk threads. We are indebted to Dr. Marion Sims, of New York, for the introduction of the silver suture, which he has found peculiarly advantageous in cases of vesico-vaginal fistula and other operations in that quarter. He advocates very strongly its general employment in surgery.

Sutures perhaps have been too freely employed heretofore; they have since been too much decried. The objections to them, as formerly used, are rather applicable to the mode than to the principle. The older surgeons used large needles, and large threads; they were carried deeply, with the intent of uniting the wound throughout its whole depth, and then left in indefinitely, causing inflammation and suppuration, and often cutting their way out from the swelling of the parts. When properly employed, that is, when small needles and threads are used, and not carried deeper than the skin and adipose layer, and cut out as soon as their purpose is answered, they are sometimes necessary, often advantageous, and never hurtful. They should be used in wounds of the eyelids, eyebrows, and face generally, where accurate adjustment is necessary to prevent or lessen deformity. Small needles and silk should be used, and the threads may be cut away in twelve or twenty-four hours. I have seen unpleasant results from neglect of these simple precautions. In one case, a transverse wound through the whole thickness of the upper eyelid was allowed to cicatrize, so as to leave an opening in the lid like a button-hole; in another, there was a fissure like that of hare-lip; while in a third instance a flap of skin, including half an inch of a thick black eyebrow in its middle, torn down by an accident, was allowed to heal below the level of the rest of the brow.

If the preference between sutures and plasters for the

treatment of incised wounds were made a general question, my answer would be in favour of the former. The object is to unite the edges, and maintain them in contact by means incapable of fretting the wound itself, or of irritating the surrounding parts. Plasters, particularly the common adhesive, which are irritating, press closely on the very edges of the wound, and cover the surrounding integuments to a greater or less extent. When removed at the end of two, three, or more days, the edges of the wound are found reddened and discharging, and the neighbouring skin is heated and itching. When a wound has been united partly by sutures and partly by plasters, the former portion will soon be completely healed without any redness or discharge, while the latter is superficially inflamed and suppurating. While the silver wire, or small firm silk, holds the edges well together without irritation, the wound itself and the neighbouring parts are left open, or covered by a damp cloth to prevent heat or swelling.

I have spoken of interrupted sutures, which may not unite the wound with sufficient firmness on all occasions. Being once on a visit in the country, I was called to see a boy who had been attacked in the yard of a neighbouring inn, and seriously wounded, by a boar. There was a large rent in the abdominal parietes, through which a portion of the stomach and omentum, with some intestines, had protruded. These parts were returned without difficulty, but the belly was then obviously over full, particularly as the stomach was partially filled with a meal recently taken. As the occurrence of vomiting sooner or later was most probable, and that of peritonitis almost inevitable, it seemed likely that compress and bandage would do more harm than good, and that they could not be borne. I therefore united the wound firmly by the uninterrupted suture. This mode of dealing with the

wound answered its purpose completely. After being in danger for a few days the patient recovered; there was a firm cicatrix, without any protrusion either at the time or subsequently.

In transverse wounds of the limbs, or in those of the neck or trunk near a limb, the closure of the sides will require attention to position; while position alone will accomplish our purpose in cases of cut-throat, the head and neck being bent forwards and supported in that attitude by a suitable arrangement of pillows. An uniting bandage may be employed if necessary. A few turns of a double-headed roller are carried round the head, and the two portions of the roller are then brought from behind forwards on the sides of the neck, and fixed in front to a circular bandage on the chest. A bandage may be used as a temporary measure, until the more proper means can be procured. In general the less covering over a wound, in addition to the direct means of union already described, the better.

Rest of the part, and of the body generally, is necessary in important wounds, whether accidental or surgical. After serious wounds, light and unstimulating diet is most proper, and usually most agreeable to the patient. If chloroform has been employed, it generally leaves behind an indisposition, under which there is no desire for food. Tea, barley-water, toast-water, or similar fluids, will be most agreeable. Beef tea or broth may be taken, as soon as there is return of appetite; and if the pulse should be feeble, with uncomfortable feelings, wine and water, or some other moderate stimulus, may be allowed.

Hæmorrhage—If there is bleeding from a wound, we must not close it until the flow of blood has ceased, and coagula should be previously removed with a soft sponge, as they would interfere with adhesion if left in the wound. Vessels that

bleed freely should be secured by ligature. Exposure to air and cold sponging soon stop the smaller arteries.

Secondary hæmorrhage sometimes occurs in a longer or shorter time after a wound has been closed. Faintness from loss of blood, and exposure to the air have arrested it at the time. The circulation recovers when the patient has been some time in bed, and then bleeding may come on, more particularly if the part be covered with dressings and heated by the quantity of bed-clothes. The blood oozing slowly, partly coagulates in the wound; and it may gradually form large clots, distending the parts with great irritation and pain, and making the hæmorrhage more active. This secondary bleeding is so alarming and painful to the patient, and so troublesome to the surgeon, that the means of prevention ought to be carefully studied. It would be advisable not to perform an operation, even of minor importance, at once, on a patient engaged up to the time in active exertion and free living. Stimuli should be withdrawn for two or three days, the diet at the same time being light. Costiveness should be guarded against. If the circulation is tranquil, with soft and quiet pulse, the tongue being clean, even a serious operation may be undergone with safety. Do not stop to tie vessels during the operation, unless the hæmorrhage should be inconvenient by obscuring and concealing the parts which are to be divided. After securing the principal vessels, if bleeding should still continue from many points, let the patient be put to bed, and leave the wound open for two, three, or more hours. It is sometimes advantageous to dress the wound after the patient is in bed, and even if the surface is slightly glazed. Then dress lightly, without compresses, bandages, or any unnecessary covering. Let the bed-clothes be light, and the apartment cool. If

secondary bleeding should come on in spite of these precautions, which is quite improbable, open the wound, clear out coagula, tie any bleeding vessel. Most probably, however, clearance and exposure will have stopped the bleeding. The wound should then be left moderately open, with light covering.

When the sides of an incised wound have not been brought together in the first instance, when such a wound has been attended with loss of substance, so that union could not be effected, or, when the attempt to procure adhesion has failed, then the healing must be accomplished by granulation and cicatrization, that is by the so-called second intention. The successive changes which the wound then undergoes are, cleansing of the surface with flow of serum, discharge of Pus, granulation, cicatrization. The process is correctly described by the older writers under the quaint terms of mundification, digestion, incarnation and cicatrization. Rest, with mild applications, is necessary during the inflammation which accompanies these changes; the subsequent treatment is the same as that of granulating ulcers.

Lacerated and *contused wounds*.—Lacerated wounds being effected by tearing instead of cutting, are attended with greater injury to the parts. They are, however, frequently healed by adhesion, and should be treated on that view in the same way as incised wounds. Even the degree of violence involved in a wound of the scalp inflicted by a stick or a poker, does not always prevent union by the first intention.

When great bruising accompanies laceration, as in wound of a limb by a wheel passing over it, or in great wounds by machinery, the damage to the surfaces precludes all hope of recovery by adhesion.

The inflammation following injuries is in proportion to the degree of violence with which they have been inflicted, and

to their extent; hence, in contused and lacerated wounds of the most serious description, we expect high inflammation, generally with more or less extensive sloughing of the wounded surface, and corresponding constitutional disturbance. Repair must be gradually effected in such cases by granulation. The injured part placed in an easy position, with the sides of the wound gently supported and approximated, may be covered with wet cloths or a soft poultice. Oiled lint sometimes answers well as a covering, and does not require frequent change.

I had under my care, in St. Bartholomew's, a remarkable instance of lacerated and contused wound, in which the parts had been subjected to extreme violence. A stout coal-heaver twenty-eight years of age, being drunk when driving his waggon, fell just before the wheel, which caught in the bend of the knee, carrying the limb before it close on the ground, but not going over it. All the soft structures were divided down to the bone, immediately above the knee, the wound measuring five inches transversely and three inches in depth. It was completely blackened throughout by the mud along which it had been violently carried, which was forced into the severed structures for some distance. Although no injury of the joint was discoverable at the time, the singular nature of the injury and its close proximity to the knee excited some apprehension. After removing small bits of gravel and cleansing as far as was practicable, the wound was covered with a cold poultice, and the knee supported by side splints. A free venesection was necessary on the same evening, and a repetition of the measure in smaller quantity was required on the following day. Milk diet. The local inflammation did not exceed the amount necessary for the repair of such an injury, and there was no fever. He left the hospital with the wound soundly cicatrised, and in excellent health, in two months.

Gunshot wounds have been formerly supposed to be peculiar in their nature, and altogether different from other descriptions of injury. The violence, the damage, and the danger, are far greater, and the symptoms more alarming. Hence, at first, they were thought to be poisoned, and treated on that notion by supposed antidotes, such as turpentine, hot oils, balsams, &c. The great wars of modern times have afforded abundant opportunities of cultivating this department of surgery, which is therefore now well understood. The only peculiarities of these wounds are in the nature of the bodies by which they are inflicted, and in the degree of violence with which such bodies come in contact with the human frame. The injuries are inflicted by bullets, balls, fragments of shells, splinters of wood and stone; and these act with the greatest force. Hence laceration and contusion are carried to the highest degree with inevitable disorganization of the affected structures.

The degree of violence is various:

1. Direct blow by the projectile in full force; the part is traversed, or a limb is carried away.

2. Direct blow with diminished force; causing laceration, contusion, with fracture, the latter being generally splintered.

3. Oblique blow, consequent contusion and laceration of muscles, ecchymosis, fracture without breach of skin. This description of injury is popularly ascribed to the wind of the ball.

Symptoms.—The infliction of the wound may not be perceived when all the powers of the mind and body are strained to the utmost in a death-struggle, amid the heat, confusion, and stunning sounds of a battle. In other cases, it is attended with severe pain, and causes agitation, tremors, and alarm. Sometimes there is great depression of the nervous system, and consequently of the circulation and other vital processes. There

is small and feeble pulse, with coldness and paleness of the surface, shivering, and even syncope. There may be deadly paleness with general tremor, instant vomiting, and profuse perspiration. These, not inaptly called nervous symptoms, generally go off in two or three hours, especially if a slight stimulus is taken, or under the influence of kind encouragement and sympathy. If, however, this constitutional disturbance or shock should continue, it will lead to an unfavorable apprehension respecting the seat or extent of injury.

Although gunshot wounds often bleed less at first than might be expected, there is generally more or less bleeding; while serious, and even fatal hæmorrhage, may ensue from wounds of large arteries, more especially when the vessels are partially divided. When a limb is carried away, the bleeding although profuse at the moment, ceases from the mode in which the coats of the vessel give way successively. The external elastic coat having been violently stretched before it gives way, contracts and retracts so as to close the end of the vessel more or less completely for the time.

The entry of a bullet is an opening, rather smaller than the bullet itself, with the skin bent inwards, while the exit is larger, more ragged, and has the margin everted.

Treatment.—If the circulation is feeble, and the nervous symptoms are considerable, rest and warmth are necessary, perhaps with stimuli in moderate quantity. Extraneous substances, such as bullets, portions of clothing, splinters, should be removed, if it can be done easily. An incision should be made to remove a bullet, when near the surface, or sticking to a bone from which it could be readily separated. If, however, it were firmly fixed, so that it could not be removed without incisions of some extent and the employment of force it should be left to be loosened by suppuration. If it is not found easily do not persevere in the search; bullets

often pursue curious courses, being turned out of their original direction by the resistance they experience in striking against parts, and not merely against hard parts; a muscle or the skin will turn aside a bullet coming obliquely, as a ball or stone rebounds from the water. Thus a ball may pass between the skin and the thoracic or abdominal parietes half round the trunk, without penetrating either cavity, and in other cases it may reach a part considerably remote from that at which it had entered.

Bullets often remain quietly in the body for years, becoming gradually inclosed in a sort of compact cellular cyst. This is an additional reason for not probing much, nor at all after inflammation has commenced. The danger of gunshot wounds arises principally from the inflammations, suppurations and constitutional disturbance, which are likely to follow the injury: our great object, therefore, will be to prevent these evils, or to lessen their amount. Rest and low diet are obviously necessary. Surprising instances are recorded of recovery from most dangerous wounds where persons have been left for dead on the field of battle, and have remained without assistance for two or more days. Nothing more is required as local application for three or four days than cloths dipped in cold water, or simple poultice either cold or lukewarm.

The ancient practice of introducing into the wound foreign substances under the name of tents, or pieces of prepared sponge, in order to provide for the escape of discharge, is now quite obsolete, as well as the application of bandages, except for some specific purpose.

The practice of dilating the wound, that is, of making notches in its orifice, to prevent tension and facilitate the escape of discharges, was formerly generally followed, and is perhaps not yet entirely given up. We endeavour to prevent

inflammatory swelling by suitable treatment, and then discharge and sloughs pass out easily through the wound: should matter be confined by any impediment in the suppurative stage, an opening may then be made for its discharge. The only reason for making incisions in the early stage would be to remove splinters of bone, balls, or other foreign bodies.

More or less variety may be expected in the nature of the mischief if we include under the general expression of gunshot wounds all the injuries inflicted by fragments of shells, explosions, and other incidents of actual warfare. The wound may be lacerated, and not contused. Thus at the siege of the citadel of Antwerp, M. H. Larrey saw several cases where the solutions of continuity were perfectly regular, and more or less like those made by a cutting instrument. These, however, are exceptional occurrences. The general course is that the surface of the wound, disorganized by the violence of the injury, sloughs, inflammation and suppuration occurring in order to throw off the dead portions. Thus discharge from the wound, with some swelling and heat, may be expected at the end of four or five days. When this suppurative stage begins, cold applications are laid aside and poultices substituted. As soon as the sloughs have been detached, granulation and cicatrization follow. Fistulous openings may remain connected with injured bone or the presence of foreign bodies, and in the former case inflammation with discharge of bony fragments may be renewed occasionally, for an indefinite period.

Secondary hæmorrhage is not uncommon in this suppurative stage. Wounded arteries, which may have ceased to bleed at the time of the injury, may become troublesome from the clearance which the track of the wound now undergoes. From about the eighth day, therefore, patients must be closely watched whenever there is reason to suspect, from the

presumed course of the wound, that an artery likely to afford a troublesome or dangerous bleeding, may have been involved in the mischief. If the dreaded bleeding should occur, it would be desirable to secure the injured vessel; the attempt would be unpromising in a suppurating wound deeply and dangerously situated. Under such circumstances recourse has been had to ligature of the main artery above the wound; this has sometimes succeeded, sometimes failed.

Question of amputation.—In wounds of the extremities the degree and extent of injury are so great, in some instances, as to preclude all expectation of recovery. The fatal event will be brought about speedily by traumatic gangrene, in a somewhat longer time by violent inflammation and fever, or still more remotely by repeated suppurations, gradual exhaustion, and hectic; to say nothing of the risks of secondary bleeding in both of the latter cases. In other instances the point is doubtful; if we attempt to save the limb, life is endangered by the local injury and general disturbance closely following the accident; or the patient, after months or years of suffering and danger, recovers with a limb so damaged in structure and office as to be less useful than an artificial substitute. In army cases the necessity of moving the patient, and the want of accommodation, are to be considered.

Amputation, therefore, is unquestionably necessary in some cases, and clearly expedient in many others, in spite of the authority of Frederick the Great, king of Prussia, who, vexed by seeing so many of his soldiers rendered useless by loss of limbs, determined that the practice should be discontinued. Bilguer, chief surgeon to the Prussian army, published in 1760, apparently by royal command, a work on the subject, entitled, 'Dissertatio de Membrorum Amputatione rarissime administranda, vel quasi abroganda,' the arguments of

which are answered by Mr. Pott, with his usual clearness and good sense in his 'Remarks on the Necessity and Propriety of Amputation in certain cases and under certain circumstances,' in which he has also pointed out the proper time for its performance. (Works, vol. iii.)

The cases in which amputation should be performed may be brought under a few heads:

1 and 2. When joints are traversed by balls, with exposure of the articulation and shattering of the articular extremities. Serious wounds of the limbs, particularly the thigh and leg, in their continuity, with extensive laceration and contusion, comminuted or splintered fracture, probably extending in the latter case to the next joint. The last three quarters of a century have afforded the most ample opportunities of observation and experience in this important part of surgery, in all its varieties of situation and extent, and the practical conclusions from this mass of evidence have been well summed up by M. Velpeau, in his 'Médecine Operatoire,' tom. i, to the following effect:

"In gunshot injuries of joints, with considerable mischief, there is no doubt respecting the propriety of amputating. The difference of opinion among practitioners regards the cases where the joint is not largely opened, the osseous extremities having been simply traversed or broken by the ball. The circumstances must be taken into the account. If the patient can receive all necessary care and attention, supposing a ball to have simply traversed the wrist, elbow, ankle, or shoulder, breaking the articular extremities without lacerating the tendons and soft parts, the preservation of the limb should be attempted. On the contrary, in the tumult of camps in crowded hospitals, when destructive epidemics prevail, if the patient can neither be kept quiet, nor receive the requisite care, if the fracture is splintered, the ligaments,

synovial membranes, and tendons, bruised and torn, immediate amputation is best. Many cases of recovery under such circumstances have been recorded, and some occurred among the 'blessés de Juillet,' under Dupuytren. But how many fatal terminations could be opposed to these unexpected cures."

M. Velpeau then mentions the fatal issue of wounds by gunshot of the hand, ankle, elbow, and knee, where the injury was not of the worst kind, although treated under every advantage in Paris. He goes on to say that gunshot injuries in the continuity of the limb, especially in the lower extremities, are almost as unfavorable as wounds of the joints; thus, that a splintered fracture by gunshot of the tibia and fibula almost always requires amputation. For one who recovers, you will have ten die, especially if the soft parts are torn and bruised. The indication is still more decisive in the thigh. He quotes the opinion of Ravaton, Schmucker, and Lombard. M. Ribes gives an account of ten cases, which all ended fatally, in spite of the greatest care. Among 4000 men at the Invalids there was not one who had been cured of such an injury. M. Yvan had two, in 1815; but fistulous openings remained, and they died from the results of the injury. M. Gaulthier de Claubry formerly surgeon to the Imperial Guard, is of the same opinion as M. Ribes, and all in Spain who had met with this injury died when amputation was not immediately performed. He quotes the experience of S. Cooper, Percy, Thomson, Larrey, and Heunen. The events of July, 1830, showed the surgeons of Paris the correctness of this unfavorable prognostic. However, some successful cases occurred; one at La Pitié, under M. Lisfranc, one under Dupuytren. Arnal mentions three more. Sommé saved two out of eight at Antwerp, and some other trials were equally fortunate both at Paris and Brussels. In these

cases the patients were placed under the most advantageous circumstances. Yet even here the successful attempts were few, and the limb, when saved, was of questionable value. The danger is greatest when the fracture is towards the middle of the bone. Amputation is generally necessary in comminuted fractures by gunshot of the lower extremity; in the upper, the necessity is less urgent. We cannot lay much stress on a few unexpected cures. The question is, what proportion of recoveries may be expected, out of a given number, in both modes of proceeding.

When the head of the humerus has been broken, without great injury of the surrounding structures, removal of the damaged portion of the bone may supersede the necessity of amputation at the shoulder joint. An attempt to save the limb is more likely to succeed in the elbow or wrist than in the ankle, as the power of restoration is more considerable in the former cases than in the latter, and a stiff joint is in them of less consequence.

3. When the bone has been broken and the soft parts lacerated and crushed, without external wound, by a spent ball, or one striking the part obliquely.

4. When a considerable mass of soft parts has been shot away, for example in the thigh, especially if the artery be included, although the bone may not be broken. If the artery and vein should be divided, with fracture of the femur, amputation would be advisable, although the wound might not be serious in other respects.

5. If the bone should be extensively denuded, though not broken, by a piece of bombshell or small cannon shot traversing a limb.

6. When a limb is carried away by a cannon ball, explosion, or any other cause. The wound is lacerated, jagged, and bruised, the bone protruding and splintered. The regular

incision of an amputation is advantageously substituted for an injury of so dangerous a character. If the accident has occurred so high up as not to leave room for regular amputation, the wound should be made as even as possible, splinters should be removed, and the end of the bone taken off. The artery should be tied.

In considering the place of amputation it is a general rule to preserve as much of the limb as you can. Remember, however, that splintering of the bone often passes beyond the seat of the main injury, and thus that it might possibly be expedient to amputate above the next joint; for instance, above the knee.

A more important consideration is the best time for amputation. The arguments on this point are equally applicable to cases of compound fracture. We have to choose between immediate, or rather early amputation, that is, within ten, or at furthest twenty-four hours, before inflammation has come on in the part, and before fever has commenced, and delayed, after fever has subsided.

These are called, respectively, primary and secondary. It will be understood that the former will not be resorted to so long as the state of nervous depression occasionally attendant on these injuries has not passed off. Experience has so clearly determined the point in favour of the primary operation, that the question may be considered as settled. Mr. Pott had already taken the correct view of this important question, and has strongly enforced the necessity of "immediate or very early decision." ('Works,' vol. iii, p. 359.)

The great reason for amputation is because the injury immediately or remotely endangers life; that is, by mortification, inflammation, and violent fever, as its immediate or early effects, or subsequently by successive inflammation, suppuration, and hectic.

In early amputation there is merely the risk of the operation; if delayed, the patient incurs successively the dangers of the wound and those of the operation. Thus delay exposes the patient to the chance of dying before the period for secondary amputation arrives.

It is alleged that persons in full health do not bear operations so well as those previously reduced by disease; and this may be true to a certain extent. But the question is, will the patient, whether he be in full health or otherwise, have a better chance for life with a terribly contused and lacerated wound, attended with splintered bone, exposed joint, or other complications, than with the clean cut of an amputation? When the necessity of operation is admitted, will the patient bear it better, and have a better chance of recovery after the inflammation, the fever, the suppuration consequent on the injury, than at the moment of the accident? They will not, nor so well. Hear the result of experience.

After the battle of Toulouse, 47 primary amputations were performed; 9 of the patients died, that is, one fifth, nearly; there were 51 cases of delayed amputation, of which 21 were lost, or about one to two and a half. At New Orleans, of 45 primary amputations 7 died, being one in six and three sevenths; of 7 delayed, 2 died, or one in three and a half.

These statements are very favorable to early or immediate amputation, but they do not give the true comparison of mortality between the two methods, they do not place the advantages of the former in their full light; because to those who died of secondary amputation you should add the others who died before the time for secondary amputation arrived, and who might have been saved by the early operation.

The result of my own comparatively limited experience of

immediate or early amputation in bad compound fractures, and some gunshot injuries, accords entirely with the more abundant evidence collected by the surgeons who have practised in the great military hosts of recent times.

In gunshot injuries of the head, neck, thorax, abdomen, and pelvis, there is always something individual in each case, and the circumstances are too various to admit of being brought under general rules of treatment. In a large proportion of such injuries, patients are in the greatest danger, and their only chance of recovery lies in keeping down the circulation by strict rest and regimen, and in watching closely to anticipate the occurrence of inflammation, or to check it promptly if it should arise. Such means, aided by youth, a sound constitution, and previously good health, have frequently led to recovery from injuries which at first appeared quite desperate.

Contusion or bruise are the terms by which we denote injury without division of parts, that is, without wound. Generally, but not invariably, the vessels are so injured as to pour out blood into the cellular tissue, causing swelling, usually coming on soon, and sometimes increasing rapidly to a great and even alarming extent. In its most violent degree contusion so disorganises the part as to stop the circulation, and thus cause mortification. This is seen on a small scale in blows on the shin where the skin is violently squeezed at the time of the accident between two hard bodies. Slighter bruises, occasioning merely temporary inconvenience, are little thought of; when the injury is more considerable, it interrupts or suspends functions, as in muscles and joints, and may lead to inflammation, particularly under neglect or imprudent exertions.

The most important point of treatment is to rest the injured part for a sufficient time, and to avoid premature exertion.

Cold lotions may be used if there is heat; when there is firm swelling with pain, leeches and poultice will afford relief. It is of importance to prevent inflammation when a joint, or considerable muscles, are injured, and to check the disorder if it should have supervened. When general swelling with stiffness, and more or less uneasiness on exertion remains, as it does occasionally for some time after serious bruising, bandaging with or without adhesive plasters, and elastic supports, are often useful. Friction with stimulating liniments may sometimes be necessary.

The blood which escapes from vessels injured in bruising, constituting what is technically called ecchymosis, may either be diffused and infiltrated in the cellular texture, or collected into one mass. In the former case, which is the more frequent, as the cells of the texture communicate freely, the fluid blood often passes along them, to a considerable distance from the seat of injury. In a few days its presence discolours the skin, turning it dark-red, livid, or even almost black. Subsequently it becomes yellowish or greenish, and this discoloration may extend, like the blood, beyond the bruised part. If the swelling of ecchymosis takes place rapidly, so as to render the part tense, the blood is forced into the tissue of the skin, which thus becomes immediately of the deepest livid and almost black colour, with great alarm to the patient and those not conversant with the appearance. In all these cases of ecchymosis the blood is gradually removed by absorption. Cold is applied in the first instance, to prevent increase of the effusion; whether its disappearance subsequently is hastened by friction with soap liniment is somewhat doubtful. In a rapidly increasing ecchymosis it might be necessary to make a free incision, in order either to stop the hæmorrhage by exposure or to tie bleeding vessels if any such should be found. I once had occasion to do this where the scrotum had become

enlarged in the course of three hours, by internal bleeding, to an enormous size, and was still increasing, with deep livid discoloration and most severe pain. As the swelling passed upwards on the abdomen, the incision necessary for complete exposure was nearly a foot long, exposing such a degree and extent of bloody cellular infiltration as could hardly be paralleled under any other circumstances. Although the swelling had been constantly increasing till the incision was made, no bleeding vessel could be discovered. The integuments, relieved from distension, contracted so as to diminish the exposed surface, which was still considerable. The granulating process went on well, and the patient, though much weakened by the very large loss of blood, soon regained his strength.

When effused blood forms a collection instead of being infiltrated, it may retain its fluidity, and form a soft, fluctuating swelling in the part, which may be mistaken for an abscess. The previous injury, and the absence of the symptoms denoting suppuration, ought to prevent the possibility of such a mistake. Although the fluid blood sometimes remains for a rather long time in the part, it will be ultimately absorbed. If the blood of an ecchymosis coagulates, instead of remaining fluid, it sometimes irritates the surrounding textures, and may even cause inflammation and suppuration. A free opening is necessary, giving issue to the coagula and matter, with great relief. I have made an incision into a labium when immensely distended, coal black, and very painful, turning out some ounces of black coagula, completely easing the patient although suppuration had not occurred.

CHAPTER XII.

POISONED WOUNDS—HYDROPHOBIA—VENOMOUS SERPENTS—DISSECTION WOUNDS.

POISONED WOUNDS.

The most formidable of these is the bite of a rabid animal, which, although presenting no peculiarity either at the time of infliction or subsequently, introduces directly into the human frame a poison generated in certain animals when labouring under the same affection. This poison excites after an interval of a few weeks, sometimes extending to months, a violent, general, and peculiarly distressing disorder of the nervous system, speedily, and as far as our present knowledge extends, invariably fatal. The general disease is called hydrophobia, which means literally, dread of water, from a singular symptom which is peculiar to it in the human subject; it is also called rabies or rabies canina, in English canine madness, or simply madness; in French, *la rage*.

The disease is communicated by the saliva, which becomes poisonous in rabid animals. No noxious property is discovered in any other fluid, nor in any of the solids. Perhaps there may be an exception to this statement in the case of the blood; there is, at least, a difference of testimony on the subject.

Dupuytren, Breschet, and Magendie produced no effect by rubbing wounds with the blood of rabid animals; they also injected the blood of rabid dogs into the veins of healthy animals, without injury to the latter. Dr. Hertwig (of Berlin), however, found that rabies could be produced in the dog by injecting the blood of another affected with madness into the cellular substance. Out of eleven, thus inoculated, two died of rabies. 'Beiträge zur nähern Kentniss der Wuth-Krankheit von Hertwig, M.D., Director of the Royal Veterinary School, Berlin, in Hufeland's 'Journal der praktischen Heilkunde', 1828. An analysis of this paper will be found in the 'Edin. Med. and Surg. Journal.,' vol. xxxii, p. 378.

We know the disease in the human subject only as the result of infection, that is, as conveyed, like smallpox or cowpox, by direct communication of poisonous matter from animals to man. Does it ever arise spontaneously in either case?

In man, some kind of aversion to or dread of liquids has been seen in rare instances, as a symptom of another affection, and might be called symptomatic hydrophobia. But that very marked horror at water and other fluids, which constitutes so striking a feature in the fatal affection ordinarily called hydrophobia, is only known as resulting from direct application of the poisonous saliva to a wounded or abraded surface.

In animals it is rather difficult to determine the point; dogs, particularly, may be wounded without our knowing it. Some circumstances would lead us to suppose that in them, as in man, the source of the malady is extraneous, that it is produced by infection, and does not originate spontaneously. The communication by infection is an ordinary and well-known occurrence, while the spontaneous origin is obscure and doubtful.

Sportsmen, who have many dogs, keep hydrophobia out of their kennels by making every new comer perform quarantine before he is admitted. In insular situations, many years have often passed without any appearance of the disease. Dr. I. Hunter states that no case of hydrophobia had occurred in Jamaica for forty years, although the dogs are as numerous there as in any place in the world. ('Trans. of a Society,' vol. i.) This leads me to mention that heat of climate or season does not seem to have the commonly supposed efficacy in producing hydrophobia. It is rare in the West Indies, not known in Egypt and some other hot countries; it occurs here in winter as well as in summer.

On the other hand, Dr. Hertwig states that he has frequently seen rabies arise spontaneously in the dog, the causes of origin being very obscure. It appears, he says, in dogs of every race, and all ages; under every species of management; at all times of the year, and in every kind of weather. Heat and cold have no influence in its origin. Chamber dogs are more liable to it than those exposed to the weather.

We cannot, I think, help admitting with Dr. Hertwig that hydrophobia must originate spontaneously in the dog. The history of the disease cannot be accounted for except on that supposition. There are not here, as in smallpox and cowpox, constantly existing sources of infection, by which the poison can be directly conveyed from one animal to another. The disease, though so much talked about, is of rare occurrence. Many surgeons of the most extensive practice have never seen a case, and it is of the greatest rarity in the large hospitals of London. Considerable periods of time elapse without a case being heard of in England, and if an instance or two should turn up after a long interval, the animals are soon put out of existence. These circumstances are quite inconsistent with the notion that the disorder can originate

only in the direct communication of the poison from another rabid animal. The French may probably have considered this point in reference to the wolf, but I have not met with any information on the subject.

The animals liable to the disease, besides the human species, are chiefly the domesticated races; those brought under the dominion of man, and associated with him. The dog, wolf, and fox, closely allied, and breeding together, are the most liable, hence the name of rabies canina. Of the jackal (canis aureus) we have no information. The cat, horse, ass, mule, cow, sheep, pig, goat, are subject to the disease.*

All animals are not equally susceptible; perhaps dogs are most so, yet the cases from bites of wolves are frequent in France. Four men and twelve dogs were bitten by one dog; all the dogs went mad, while all the men escaped, though they used no means of prevention. Twenty persons were bitten by the same dog; only one had the disease. (Dr. I. Hunter in 'Trans. of a Society,' vol. i, p. 302.)

Yet sometimes the human subject seems very susceptible. Twenty-three individuals were bitten by a female wolf; thirteen died in the course of a few months, besides several cows wounded by the same animal. Of ten individuals bitten by a wolf nine died; of twenty-four persons bitten by a wolf, near Rochelle, eighteen perished.

The disease is communicable only by the dog, wolf, cat, and fox, if indeed the statement be well founded that a Duke of Richmond died in Canada from a bite by the animal last mentioned.

From numerous experiments made in the French veterinary school at Alfort, it appeared that herbivorous quadrupeds could not communicate the disease. Professor Dupuy could

* Cooper's 'Dictionary,' p. 698.

not produce hydrophobia in cows and sheep by wounding them and applying to the part sponge moistened with the saliva of rabid animals of the same class; but the disease was excited when the sponge was moistened with the saliva of a mad dog.

According to Dupuy, no communication of rabies takes place in flocks of sheep by the presence of those affected with the complaint.

Can hydrophobia be communicated from one human being to another; or to other animals? No instance of the former is known. Many attempts have been made to convey it by inoculation to other animals. These have failed, except in one or two instances. Magendie and Breschet inoculated two dogs on June 19th, 1813, from a patient in the Hôtel Dieu; one became rabid on the 27th July, and bit two other dogs, one of which was affected with hydrophobia on the 26th of August.

Mode of production.—The poisonous saliva by which the disease is produced, must be applied, either to a recent wound or to a raw surface of the skin. It has no injurious effect either on entire skin or on entire mucous membrane, so that it might be swallowed with impunity.

The infection, received in the great majority of instances from the dog or the wolf, is generally, but not necessarily, conveyed by a bite. Some years ago, a lady of rank and fashion had a pimple on her face, of which she had scratched off the head; she had a lapdog, which she allowed to lick her face. Hydrophobia was thus contracted, and she perished by this terrible disease.

The disease is communicated most certainly by the bite. Mr. Cline and Sir A. Cooper both failed in attempts to introduce it in the dog by inoculation, the former from the human subject, the latter from the dog. (Travers, 'On Constitu-

tional Irritation,' vol. ii, p. 404.) A silk drawn through the mouth of a rabid dog, and then placed as a seton, in the nape of a healthy dog, will impart the disease to one or two in six. (Ibid.) In fifty-nine inoculations, partly with saliva, partly with blood injected into the cellular tissue, rabies was produced fourteen times, that is, in 24 per cent. ('Edin. Journal,' vol. xxxii, p. 388.)

The bites may take effect either on covered or naked parts. In the latter case the disease will probably be produced, unless proper means of prevention are resorted to; while in the former, the teeth are freed from the poisonous matter by passing through the dress, and inflict no injury beyond the mere wound. The wound inflicted by a rabid animal exhibits no peculiarity; the local appearance, the progress, the reparation and healing are the same as in a bite by a healthy dog.

A more or less considerable interval elapses between the injury and the appearance of the disease, that is, the hydrophobia, rabies, or madness. The terrible malady is analogous in this respect to smallpox, cowpox, scarlatina, and syphilis, the interval not being regular, and nearly defined, as in the three former; but indefinite, as in the latter. The most common time of commencement is from the thirtieth to the fortieth day; say five to seven weeks; it is sometimes earlier than the first, often later than the last. In a large number of cases collected by a society, the time varied from thirty-one days to seventeen months. Dr. I. Hunter considers seventeen, and Dr. Hamilton nineteen months, as the longest well authenticated intervals. The latter mentions eleven days as the earliest period. The two long dates above mentioned deviate so widely from the ordinary course of experience on the subject, that strong evidence would be required to establish their correctness.

I do not know whether they could be sustained by sufficient proof.

In fifteen patients seen by one observer, the limits were fourteen days, and fourteen weeks. Of seventeen persons bitten by a wolf, ten had hydrophobia; one on the fifteenth, one so late as the sixty-eighth day. (S. Cooper 'Dict.' p. 700.) Fifteen persons were bitten by a mad dog on the 27th of January, ten received the bites on the naked flesh; of these five died between February 27th and April 3rd. (S. Cooper, p. 698.)

The appearance of the symptoms has sometimes been preceded by changes in the part; by heat, redness, and pain, the latter shooting along the limb. Generally there are no such symptoms, and the patients have sometimes even forgotten the injury.

In a first short stage of the complaint there is usually headache, and some general indisposition, speedily followed by the peculiarly characteristic symptoms.

These may be stated to consist generally of the strongest aversion to or horror of liquids, especially of water, and of the severest spasmodic agony excited by the attempt to swallow it. The complaint sometimes begins altogether suddenly with this strange suffering. If the patient is induced, not without difficulty, to repeat the effort, violent spasm of the throat and neck, with sense of choking and ungovernable agitation are produced, altogether defeating the object, and impelling the patient to escape from the bed or room; this spasm being sometimes so powerful and general as absolutely to prevent the desired movements. The same distress, in less degree, is caused by the mere presence of water in sight, and particularly by the sound of pouring it from one vessel into another; yet a youth under my care in St. Bartholomew's, during a hard frost in the winter, ate greedily thin ice, chewing it like a biscuit to relieve his thirst. Spasms will be brought on also

by a bright object, such as a mirror seen suddenly; by a strong light, or draught of air. There is now excessive cerebral excitement with delirium, spasms, and sometimes ungovernable screams. There are intervals of comparative rest, with paroxyms of spasm and suffering, which soon wear out the patient, the time of death varying from thirty-six hours to five or possibly six days.

There is not the slightest foundation for the notion that the unfortunate sufferers attempt to bite those near them, or that they utter sounds resembling the barking of a dog.

Examination after death shows vascular disturbance in the brain, and some slight redness of the pharynx, but nothing to throw light on the peculiar character of this terrible disease.

Dr. Hertwig has minutely described the morbid appearances in the dog, from nearly 200 dissections. He says that he has seen all the appearances described by others, but "with all the pains I took I have been unable to discover any constant change of structure, or one peculiar to rabies; and that, like the symptoms during life, the appearances after death are very different in their nature, extent, and intensity." ('Edin. Med. and Surg. Journ.,' vol. xxxii, p. 384.)

Treatment.—All attempts to arrest the complaint have been hitherto unsuccessful; not a single case of recovery has been authenticated. Opium has been given by the mouth, by clyster, and by injection into the veins, in large doses, with some temporary, but no permanent benefit. Patients are not readily susceptible of the action of narcotics in this disease; such medicines must, therefore, be administered freely in order to produce even short relief.

A pint of tepid water injected into the veins, by direction of Magendie, caused temporary tranquillity, with power of swallowing liquids; but the symptoms returned with the usual fatal result. Bloodletting has been tried largely, without any effect.

The only hope of safety, then, is in prevention, and the interval between the bite and the outbreak of the symptoms affords a favorable opportunity for accomplishing this object. As the fluid poison causing the mischief is introduced into a wound, it would seem, on first view, a natural and easy course to remove it by careful ablution. If this should be attempted in the first instance, before excision can be resorted to, it should be carried into effect systematically and with perseverance. Tepid water (about 90) should be poured in a continuous stream out of a tea-kettle from a height of four or five feet, on the wound, exposed as openly as possible. If the wound should have penetrated, a smaller stream may be directed against it forcibly, by means of a strong syringe. These attempts might be continued for some hours.

Escharotics have been applied to the wound, and even the actual cautery has been used. We can hardly doubt that if the mild lunar caustic were effectually rubbed on all the surfaces to which the tooth of the animal has reached, especially after careful ablution, that the patient would be safe. Still, as pointed teeth may have penetrated deeply, and parts may be considerably lacerated, some uncertainty must remain. It is recorded that hydrophobia supervened in a youth from wound of the face, where caustic had been applied to the parts at the time of the accident, by Mr. Hunter.

The only measure on which we can rely with perfect confidence for placing the patient in safety, is complete excision of all the wounded parts. This may be preceded by careful ablution, if the wound should be lacerated, irregular, and penetrating. Previous examination with the probe will show how far the injury has reached, and we must carry the knife still further, rather going beyond than falling short of what may seem absolutely necessary.

Immediate excision is not necessary; it may be performed

with apparent success, some hours and even some days after the wound. What is the limit in respect of time? May it be practised with preventive effect at any period between the receipt of the wound and the commencement of hydrophobia? that is, does the poison stay in the part? On that point we are absolutely ignorant, and there is little prospect of our arriving at certainty on the subject. High authorities have directly asserted that excision of the wounded parts at any time before the occurrence of symptoms will be effectual in preventing the attack. No sufficient evidence can be produced to support this dictum, which is involved in uncertainty by the very circumstances of the case. Of many persons bitten by one and the same dog or wolf, several die, while some escape who have taken no more precaution than those who died. If excision at a remote period had been performed in these fortunate cases, it would have had the credit of saving them.

A gentleman was under my care who had been bitten on the thumb and hand by a dog, to whom no suspicion attached at the time. He employed water dressing, and left the country, where the accident had occurred, for London. The dog, which was soon discovered to be ill, died of hydrophobia, and I excised the injured parts at the end of the fourth day. There was no subsequent illness. I cannot lay much stress on this case, as the wounds, though not inconsiderable, were superficial, so that any poisonous matter might have been washed from them by the water which was applied plentifully from the beginning.

Mr. Travers has published in the second volume of his work on 'Constitutional Irritation,' p. 410, the following communication from Mr. Hodgson: "The efficacy of excision of the bitten part at any period before the accession of symptoms, is illustrated by the following fact, which occurred in my own practice. A dog on the same day bit a child, and subsequently

a man, the man immediately destroyed the dog. A few weeks afterwards, the child was attacked with hydrophobia, and died. After the child was seized with the symptoms of hydrophobia, I cut out the bitten parts in the man's arm. The disease did not occur in the man, though he had been exposed to the fullest chance of taking it, his arms being bare at the time of the bite, and, as was proved by the occurrence of the disease in the child, the dog being at that time certainly in a state capable of communicating it." A single case of this kind does not go far towards establishing the important practical conclusion of the authorities already referred to.

Chemical examination of the saliva has not thrown any light on the nature of this very peculiar disease.

Although hydrophobia is very rare, bites by dogs are common enough, and we cannot be surprised that they often excite alarm and anxiety by suggesting the possible occurrence of hydrophobia. If the dog by which a bite has been inflicted, has been previously, and is at the time in good health, there is no ground whatever for apprehension. If this should be otherwise, and particularly if the same dog should have bitten other persons or animals, without having been at once hunted down and killed, he should be confined and observed, when a few days will decide the matter, so far as hydrophobia is concerned. The general symptoms and usual course of the malady in the dog should be known to the medical authority consulted on the occasion, who may have to pronounce an opinion on view of the animal, or from description of its condition.

The disease in the dog.—The dread of water does not occur either in the dog or in any other rabid animal, nor is there altogether such violence of symptoms as the term rabies might lead us to expect.

According to Hertwig, the disease shows itself in the dog

under two forms, the more violent, which he calls *raging*, and the *still* (Rasende and Stille Wuth). The former begins with a change in the temper and behaviour. There may be dulness, sluggishness, and peevishness, or increased activity. Restlessness is an early symptom; the animal shifts about without an object, and is thus impelled to leave home; but he returns. They know and obey their master and keeper, but less and less as the disease advances. Loss of appetite occurs early, and almost invariably accompanied with a propensity to swallow indigestible substances, such as straw, leather, wool, fragments of wood, turf, and glass, also their own urine and dung, and those of other dogs. There is constipation, and generally thirst, with frequent lapping of water, which is not properly swallowed in consequence of swelling of the tongue or throat. An important and invariable symptom is a change in the cry; it is a single short bark, suddenly changed to a short howl. In no other disease does a similar change of cry occur. The disposition to bite generally prevails, but varies according to natural character; it is increased by irritation. There is rapid emaciation; the muzzle, lips, and tongue, are generally dry. Paralysis of the hind limbs appears at last.

In the *calm* or *still* rabies there is also at first a change of manner, inactivity and listlessness. There is paralysis of lower jaw, and consequently open state of mouth; hence fluids, when lapped, run out. The saliva also flows out. There is less tendency to bite, or to run away. The same change of cry is observed. In both cases they bite and gnaw objects near them towards the end, and seem angry when approached. There is tough, frothy saliva about the mouth. Death occurs in from six to eight days, sometimes sooner; ten is the outside.

The disease breaks out in the dog within fifty days after the communication of the poison. Dr. Hertwig never wit-

nessed it after a longer period. ('Edinb. Med. and Surg. Journ.,' vol. xxxii.) Suspected dogs are tied up for fifty-one days at Alfort.

It is clear from the foregoing statement, that if a suspected dog continues well for ten days, he neither has nor has had hydrophobia; also that if a dog has been bitten by another unequivocally rabid, and remains well for fifty-one days, he will not be affected with rabies.

If a person should be bitten by a dog which runs away and is seen no more, the chances against his being mad are a thousand to one, probably much higher; if the bite should also have been inflicted on a covered part, there cannot be the slightest ground for apprehension. Still, if a nervous person should be haunted by the dread of hydrophobia, perhaps the mind will not be quieted till the wounded part has been cut out. I once did this, as I considered, quite unnecessarily, for a surgical colleague, who agreed in the view of the matter which I presented to him, but added simply that he should continue uneasy if the part was not removed.

It is hardly necessary to mention the means not unfrequently resorted to by those who have been bitten by animals supposed to be rabid, on the popular belief that they are capable of preventing the fatal malady. One of them is, in the language of the country, "going to the salt water" to be there ducked with as much perseverance and repetition as can be practised with safety. Another is the swallowing of the so-called Ormskirk medicine, or some other similar composition of perfectly inert ingredients. As there is no danger in the great majority of instances, the patients believe themselves to have been saved by the processes to which they have been submitted, and thus strengthen the common faith in the efficacy of such means.

VENOMOUS SERPENTS.

The bite of these animals is more immediately serious and alarming, both in its local and general influence, than that of those affected with rabies, though the constitutional disorder, however dangerous, is not invariably fatal like the general excitement of hydrophobia. While the poison in the latter case remains dormant for weeks or months, the local effect in the former is immediate, and quickly rises to its highest intensity, the constitutional disturbance proceeding and increasing at the same time. This course is essentially necessary to the accomplishment of the object for which the poisonous property exists, that of disabling the animals which form the prey of these serpents.

The venom is secreted in a small gland situated near the articulation of the lower jaw on each side of the head, and furnished with a duct which opens into a small canal hollowed out in the poison-fang. This is a small, smooth, and perfectly sharp-pointed tooth, admirably adapted to perform a species of inoculation, introducing and lodging safely at a suitable depth a minute portion of the venom by a sudden sharp stroke of the head. In non-venomous serpents there are four longitudinal rows of small, sharp-pointed, upper teeth, ranged from before backwards, two of them on the palate, the two others on the sides of the upper jaw. In the venomous species the lateral rows are wanting, and in lieu of them there is a poison-fang at each anterior corner of the mouth.

Some of the more dangerous kinds are popularly known, such as the rattlesnake of North America (Crotalus) of which the bite will kill a cat or puppy in a few minutes. It may be fatal, but is not always so to man, or even to animals.

The hooded or spectacle snake of the East Indies, Cobra de capello (Coluber naia), is powerfully venomous, destroying a fowl within a minute, a dog in half an hour, and a human subject in a few hours. There are actively poisonous serpents in considerable numbers in some of the West India islands, at least in Martinique and St. Lucia. One of them is called the yellow or spotted snake; Vipére fer de lance (Coluber carinatus, Linn.). On one occasion an officer and several men were killed within a short time, dying from six to twelve hours after the bite. The viper or adder is the only venomous serpent found in England. The bite produces troublesome local symptoms, but is not dangerous and still less fatal, though it may have caused death in some exceptional cases. Fontana found that three vipers could not destroy a dog of sixty pounds weight.

The poison does not act on the sound skin, or mucous membrane; thus it may be taken into the stomach with impunity. A student swallowed the poison of four large vipers without injury and no effect was produced on a pigeon by taking the poison of ten vipers. Like the poison of hydrophobia, it must be introduced into a wound. In many experiments on dogs, punctures with lancets charged with venom, even from the most poisonous Indian serpents, failed to produce any effect, although the bite of the animal was rapidly fatal.

The local effect is considerable swelling, rapidly extending along the limb and to the trunk, the skin being mottled and dark purple or livid; inflammation and suppuration of the cellular membrane may supervene. The general symptoms are vomiting, torpor, and loss of consciousness, sometimes a state resembling intoxication; enfeebled action of the heart.

If the case were seen sufficiently early, excision of the wounded part, scarification and ablution, and ligature above

the wound, if on a limb, might be resorted to. Stimuli and cordials, obviously indicated by the failing powers of life, have been freely administered; such as ether, brandy, or wine, volatile alkali locally and internally, particularly the spiritus ammoniæ succinatus, under the name of Eau de Luce.

In the East Indies, where venomous serpents are numerous, great reliance is placed, and not unjustly, according to Dr. Russell, in his 'History of Indian Serpents,' on a remedy called the Tanjore pill, consisting of white arsenic (arsenious acid) combined with vegetable matters, so that each pill contains about one grain of the arsenic. Mr. Ireland, an English army surgeon, then stationed in St. Lucia, tried the use of arsenic freely in four bad cases of bites by the most dangerous serpents of the island, and communicated the results to the Medical and Chirurgical Society, in a paper published in the second volume of their 'Transactions.' He was bold enough to give two drachms of the liquor potassæ arsenitis of the London Pharmacopœia, containing one grain of the arsenic for a dose, and to repeat it every half hour for four hours in two, and three hours in other instances, in all of which the treatment was successful. Purgative clysters were employed at the same time, and free purging took place, sometimes with vomiting.

Comparing Mr. Ireland's doses of six and eight grains of arsenic swallowed in three and four hours with our own familiar experience of the fatal effects produced by much smaller quantities, we can only conclude that the serpent poison renders the human frame comparatively insensible to the immediate action of the arsenic, while it is quickly expelled from the alimentary canal, by the early and free purging, which is a part of the plan. Still, until faith in the method has been somewhat strengthened by further evidence

of its safety, a doubt might arise whether the poison or the remedy would be the most dangerous to life.

The sting of an insect, such as the bee, wasp, or hornet, is a minute puncture, with the introduction of an acrid fluid. A small, firm, inflammatory tumour of the skin is quickly produced, with a more general and sometimes considerable swelling around, and a peculiar stinging and smarting pain. The local effects and the suffering are the most considerable from the sting of the hornet, two, three, or four of which might cause constitutional disturbance of somewhat alarming though not really dangerous character. From the multiplied stings of bees, death has been known to ensue within a short time. A French gentleman having been unlucky enough to overturn a beehive, was immediately attacked and covered by the disturbed insects. He became pale and cold, the pulse sunk, the breathing was interrupted; he felt that he was going, and death took place in less than fifteen minutes. ('Archives Générales,' v. 15.)

The statements respecting the poison of the tarantula spider are fabulous. Fleas, bugs, gnats (musquitoes), scorpions, simply bite, being often painfully annoying, but not dangerous. They come generally under domestic treatment.

Injuries received in dissection have generally been placed under the head of poisoned wounds, though doubts have been entertained respecting the propriety of the arrangement, that is, whether any poison is introduced into the body through these wounds or not. There are arguments on both sides of the question, which has no practical importance, as treatment does not depend on the nature of the cause, but on the character of the local and general disturbance in each case.

The original injury in these cases is trivial, a superficial and small cut, a scratch, a needle puncture, in sewing up a body. Similar effects not unfrequently ensue from the like

trivial hurts in cooks, especially in handling and preparing game or poultry. Local irritation ensues, inflammation is excited, and extends to the neighbouring parts or the entire limb; constitutional disturbance takes place, not unfrequently so violent as to endanger life, and sometimes, but rarely, to terminate fatally.

The local and constitutional mischief, in the great majority of instances, are analogous to what we see as the effect of similar injuries where no suspicion of poison exists; but the degree of disturbance, especially of the latter kind is much more considerable than in simple injuries; while the nature and progress of the symptoms, and the fatal event, in some few instances, are widely different from what we see in simply mechanical hurts. It must therefore be admitted that there is at least a striking peculiarity in a certain portion of these injuries, a difference of effect, as compared with the results of common wounds, which naturally leads to the inference of a specific cause, and that cause is considered to be an animal poison.

Dissection wounds may produce simple inflammation and superficial suppuration; swelling with heat and pain of the limb; mortification of the wounded part, the last phalanx; or two phalanges; inflammation of the absorbent vessels and glands, evidenced by red lines extending along the forearm and arm to the axilla; inflammatory swelling, and sometimes suppuration of the gland at the elbow or those of the armpit.

There may be simple erysipelas, or the deeper mischief of phlegmonous erysipelas, leading to suppuration in the palm or back of the hand; also thecal abscess, with mortification of the flexor tendons.

These several effects are accompanied by such febrile constitutional disturbance as would attend similar states of disease arising from ordinary causes.

Sometimes severe pain occurs in the injured part, with little swelling or other signs of inflammation ; the pain shoots along the limb. The nervous system is quickly and seriously influenced; there is excitement followed by symptoms of oppression. The patient is agitated and anxious, with want of sleep, prostration of strength, with great sense of weakness; small and rapid pulse, chills and rigors; a collection of symptoms manifesting a powerful impression on the nervous system, and referred to irritation as distinguished from inflammation. Pain comes on in the shoulder and axilla; diffused inflammation of the cellular tissue may take place on the chest, with redness of skin, increased irritation and death in a few days.

When violent inflammation attacks the injured part, there will be great local suffering and sympathetic fever, but no serious danger. In these graver cases the local symptoms are slighter and less prominent; the constitutional disturbance, on the other hand, is more formidable with the characters of irritation, not of fever. It may be said, that in one case the vascular, in the other the nervous system is principally affected. I have seen the formation of a large abscess about the pectoral muscle, with quick recovery after the discharge of its contents. In another case there was circumscribed empyema; the matter bulged forwards between the second and third ribs, and was discharged by a simple puncture, from which matter issued for a considerable time. There had been no breach of surface in this case; two small vesicles formed on the skin of the wrist, and soon dried up. There was severe pain in the arm, especially in the axilla, leading to the belief that matter would form there. Several weeks of dangerous illness preceded the suppuration in the chest, and the recovery was very tedious, protracted, and indeed imperfect. This serious illness followed the examination of a

patient who had died of peritonitis, the hands having been covered for a considerable time with the abdominal effusion.

The local symptoms show themselves at different intervals from the injury in different cases, within twenty-four hours in those of the most dangerous kind.

In considering the causes of these occasionally serious mischiefs, the suspicion of poison naturally presents itself to the mind. In the great majority of dissection wounds, the trifling injury is hardly noticed, and soon dries up. If it goes further, the local symptoms and general disturbance are merely such as similar injuries, inflicted in other ways, would produce. How different is the course in the exceptional instances, such as that recorded by Mr. Travers of a student, who slightly punctured his finger in opening the body of an hospital patient recently dead at noon on Monday. Pain came on in the evening, and increased in the night with high constitutional irritation. The next day, with slight redness of the puncture, "the nervous system became agitated in a most violent and alarming degree, the symptoms nearly resembling the universal excitation of hydrophobia." Death occurred at three o'clock on Wednesday morning, that is in less than forty hours. ('On Constitutional Irritation,' vol. i, p. 203.)

In some other happily rare cases, severe constitutional irritation, without much local disturbance has ended fatally in a few days. The following is a striking instance:

A lady, who had died of puerperal peritonitis, was examined in the presence of a physician at eight o'clock in the morning, of December 28th. He assisted in sewing up the body, and was not aware that he had injured himself. At eight in the evening, being at a dinner party, he felt some heat and uneasiness at the end of a finger, and thought he might have pricked it in sewing the body, though not aware of having

done so. A slight blush was observed, and with a lens, a minute opening in the cuticle was perceived at the centre of the red part. This was touched with nitrate of silver and with a minute quantity of nitric acid, without causing pain. He went home, and finding the finger still uneasy, as the former applications had given no pain, he again applied nitrate of silver, continuing the application till he felt it sensibly. The pain thus produced soon increased to agony, and shivering came on. Red lines were observed on the hand at half-past eight on the following morning (Dec. 29th) and an eschar, equal in size to a split pea, had formed on the finger. Leeches, fomentations and poultices, with purgatives were now resorted to. At 1 p.m., the last two phalanges of the finger had mortified. The red lines now extended to the elbow, with uneasiness in the axilla. There was complete prostration of strength, irregularity of breathing, and torpor, with the pulse from 90 to 100, and soft. During the rest of the day there was much heavy sleep, with intervals of pain. The hand and arm swelled, the absorbents were inflamed along the arm, and the axillary glands swelled. There was now great torpor, with depression and oppressed breathing. An erysipelatous blush arose on the axilla and side of the chest. Death took place at 6 a.m. on January the 1st—the fourth day.

There is room for doubt in this case whether the fatal event was owing to the original puncture, if indeed there had been such a puncture, which does not seem quite clear, or to the very energetic escharotic treatment resorted to under the influence of apprehension and alarm. The result might have been different if fomentation and poultice had been trusted to, with opium internally. A free division of the inflamed part might have been resorted to if painful swelling and tension had supervened.

The objections to the notion of poison are these: In the great majority of such wounds no effects result at all. Hundreds of dissection cuts and punctures occur without injurious consequences. Where bad effects result, they are uncertain in their nature and degree. In other animal poisons, such as the bites of rabid animals and venomous serpents, in syphilis, glanders, small-pox, and cow-pox, there is a regular course in respect to the time of origin, the nature and succession of symptoms and termination. If, then, there be poison in dissection wounds, it is altogether indefinite and capricious; the source is quite uncertain; we cannot point out any particular state of the parts dissected, or condition of previous disease, that will produce the effect. Again, in dissecting the same body, one suffers, others escape. Indeed the state of health of the individual is probably an important circumstance. These effects, which do not occur in strong and healthy persons, are more common towards the end than at the beginning of the anatomical season.

Serious consequences have proceeded, in many instances, from wounds received in examining or sewing up the bodies of patients who had died of peritoneal inflammation, and more particularly of puerperal peritonitis, in which the morbid effusion into the peritoneal cavity may be supposed to have been introduced into the wound, and to have made the noxious impression. Similar effects, however, may be produced by wounds received in the dissection of other bodies, and in any stage of freshness or decay. Perhaps it has happened more often where the body has been fresh. In the only instance in which I have suffered, there was inflammation and slight suppuration of the axillary glands, from examining in the middle of the day the body of a patient who had died in the morning.

So far as I know, there is no ground for fear of receiving

through dissection wounds the peculiar disease which may have affected the individual during life, except in the cases of small-pox and glanders. The venereal disease has, I believe, never been thus communicated, nor has any peculiar effect resulted from wounds received in examining cases of cancer or other malignant diseases.

Some of the effects which seem peculiar may be equally produced under other circumstances; for instance, the mortification of the skin round the puncture in the case of the physician, and the subsequent loss of vitality in the last two phalanges of the finger. Both these changes may have been caused by the free cauterization resorted to in the case. I saw an exactly similar limited mortification around a puncture of the finger, caused by the end of a needle pushed forcibly in sewing without the protection of a thimble. I saw it about thirty hours after the accident. The patient had passed a sleepless night, with severe disturbance of the stomach. Free division of the parts on the palmar surface of the last phalanx, which were tense, gave complete ease. I have witnessed three or four instances in which the last two phalanges of a finger have mortified under the inflammation induced by the neglect of trivial injuries, which the sufferers almost invariably attribute to poisoning of the parts.

Treatment.—Prudence would suggest, under all circumstances, simple measures of precaution, such as effective ablution, and covering the part with an adhesive plaster, particularly if the occupation of dissection should be continued. The solution of alum, said to be kept at hand in some establishments, is certainly not preferable to clear water, if so good. Nitrate of silver should not be resorted to except for a special reason, and the application should then be confined to a denuded surface. If inflammation

should occur, rest of the part should be enjoined. Leeches may be required, with fomentation, and poultice, probably also evacuation of the alimentary canal. Should inflammatory disturbance increase in violence and extent, free leeching may become necessary.

If suppuration should occur in the finger or hand, particularly in the theca, under fascia, or in any deep situation, it should be opened early. The part should be punctured, if the presence of matter is rendered probable by the symptoms, without waiting until fluctuation is manifest.

If high local inflammation be attended with constitutional disturbance of inflammatory character in a person of robust constitution and good health, general bleeding and other antiphlogistic measures may be advisable. A remarkable example of this kind is afforded by the following case: A gentleman of large frame, full muscular development, and in excellent health, scratched his thumb in sewing up the body of a female who had died of peritoneal disease. Most violent pain came on in the night, shooting up the limb, which swelled, and became hot, with great constitutional disturbance, marked by headache, restlessness, agitation, nausea, and shrunk countenance. He immediately lost thirty ounces of blood by venesection. On the next day the limb was greatly swelled, with inflammation of the absorbents. Leeches were applied to the part, and cold to the head. The swelling and tension of the limb, with great pain and constitutional disturbance, were all worse on the following day, when venesection was twice repeated, with numerous leeches on the limb. I saw this gentleman, an intelligent and well-informed surgeon, on the following day, the fourth from the commencement of the attack. There was inflammatory enlargement and tension of the entire limb, with great suffering. The patient believed that matter had formed in

the ball of the thumb, which was enlarged and painful, and I made a deep incision at his urgent request; a small quantity of pus escaped, and subsequently thirty ounces of blood flowed, with relief of the hand. There was still intense suffering in the forearm and arm, which could only be relieved by the local abstraction of blood, for which purpose leeches were put on by handfuls, without counting, from time to time during this and the following day. There was now a complete change in the local and constitutional symptoms, a lowered pulse, with general depression. Opium was resorted to, with generous diet, and gradual but complete recovery of health and strength, which lasted to the time of his death at a somewhat advanced age.

But when the nervous symptoms, or those of irritation predominate, general depletion or other lowering measures would be injurious. Local bleeding by leeches may be necessary, and opium to quiet irritation. The strength to be supported by mild nourishment, with suitable cordials.

A complete contrast to the foregoing picture was presented in the state of a young physician who had pricked the forefinger in sewing up a body. Some pain was felt during the day; it increased on going to bed, and became so severe as to deprive him entirely of sleep. I found him on the following morning with a haggard countenance, expressive of anxiety and alarm, a small and feeble pulse, with great sense of weakness, and severe pain of the finger, without much external change. It was determined by another medical friend and myself to recommend an immediate glass of brandy and water with laudanum, such liquid nourishment and stimuli as could be taken, fomentation, and warm poultice to the part after leeching. These means were most beneficial. Suppuration, however, took place in the theca, with sloughing of the tendons.

CHAPTER XIII.

SCALDS AND BURNS.

The application of heat to the human body will cause, according to its degree, slight inflammation, mere redness of the skin (erythema); more considerable inflammation, with vesication, without or with subsequent mortification of the skin, either superficial or in its entire thickness; or complete disorganization and death of the affected parts to a less or greater depth, according to the intensity of the heat and the duration of its application.

The term *scald* is applied to the injury caused by hot water and other similar liquids, where the heat is not greater than 212° Fahr., the boiling point of water.

The transient application of hot water causes inflammation and vesication, that is, the elevation of the cuticle by a serous fluid effused from the capillaries of the skin, similar to that caused by blistering. If the application be continued, it excites violent inflammation, with superficial mortification as its result. Other liquids, such as oil and resinous matters, which are susceptible of much higher temperature than water, and great heat in other shapes, kill the parts, reducing them to a black, firm mass, which shrinks and curls up as far as its connexions with the living parts will allow. This brown or black disorganized substance, is called an *eschar*. Εσχαρα is

the name given by the Greeks to the burnt and discoloured surface of an altar where the fire has been kindled. Hence its application to denote a burnt place in the human body. The name *eschar* is equally applied to parts disorganized and discoloured by chemical agents; and these substances are called, in reference to their action on the human body, *escharotics*. A *slough* is a part disorganized by a previous peculiar disturbance of the circulation. *Eschar* denotes disorganization by immediate chemical action. Thus, *eschar* is an effect of external, *slough* that of internal agency.

The essential nature of the disturbances excited by the action of heat on the human frame, that is, of the inflammation, with its local effects of serous effusion, suppuration, and mortification, the subsequent processes of granulation and cicatrization, and of its sympathetic influences, is not different from that of the corresponding effects consequent on the action of other causes. The two points of consequence are, the degree of injury, that is, whether it be inflammation and vesication, or disorganization, and its extent. The prognosis turns principally on the latter; the slighter mischief, when extensive, is dangerous; the most considerable, when of small extent, is free from risk.

In the worst cases, the powers of life are prostrated by the shock of the injury, and never recover; death ensues in a few hours. In extensive burns of a less serious description a violent impression is made on the nervous system, and hence arise disturbance and depression of the circulation, respiration, and digestive organs. The symptoms are: small, rapid, and feeble pulse; faintness; the respiration, at first, light and failing, becomes laborious and stertorous; there is coldness of the surface with chills, shivering, lividity of countenance, sickness, and thirst. The patient may sink under the continuance and aggravation of these symptoms, or reaction

may take place. The danger of this state is greatest in the first three or four days; at the end of that time reaction will probably have become established.

When scalds and burns of considerable extent are not attended with these dangerous symptoms, they cause severe pain, and much febrile disorder. Remember the local suffering and general disquiet caused even by a boil, that is, by inflammation in a spot of the skin and subjacent tissue. What must you expect when a considerable portion of the surface is highly inflamed?

Injuries of the trunk are more dangerous than those of the extremities. Although life should not be endangered, the local mischief and its repair may involve subsequent deformity or impaired function.

Treatment.—Two methods of treatment, apparently opposite, have been employed in different cases, namely, warm and cold applications.

In slight cases of scalds, more particularly, we may adopt the usual course of preventing or lessening local inflammation by means of cold, using cold spring water, vinegar and water, saturnine lotion. Greater cold may be produced by applying ice, or by the evaporation of alcohol or ether. The immediate immersion of a scalded part in cold water may so check inflammation as to prevent vesication.

If the part or the patient should become chill, the cold should be discontinued. Vesicated or denuded parts may be covered by light and soft dressing. The linimentum calcis, made of linseed oil and lime water in equal parts answers the purpose perfectly well. This mild and soft liniment, spread thickly on lint, gives efficient protection to the injured surfaces in the great majority of burns and scalds, and should not be changed as long as the parts are easy. It is familiarly known as the Carron oil, being the

general, if not the universal remedy for these injuries in the great Scotch iron foundry bearing the same name.

It is a question whether vesications should be opened. The object of treatment is to prevent or lessen inflammation; if this is accomplished, it is immaterial whether vesications are opened or left entire. If the part is easy there is no reason for interference. Should there be any good reason for letting out the fluid of a blister, make a small puncture; the raised cuticle subsides and still protect the sentient cutis, on which a new covering is soon produced. Exposure of the cutis should be carefully avoided, as the mere contact of the atmosphere would be painful.

In the more extensive burns, attended with prostration of the vital powers, another mode of proceeding is required. When the patient is comatose or shivering, with feeble pulse, cold extremities, and livid countenance, it would be madness to apply cold; life is already reduced to a feeble spark, which such treatment would extinguish. Here the state of the system is the most important consideration, though that of the part is not to be neglected. We must exert ourselves to restore and maintain the sinking powers of life. Brandy is the best cordial; it may be administered in gruel or arrow-root, one part of spirit to two or three of the vehicle; the mixture to be given in small quantities at short intervals. When there is much pain and restlessness, the depression of the circulation being less strongly marked, opium is advisable. In the most severe cases the patient is nearly if not altogether insensible, and the disposition to stupor and coma is an objection to the use of opium.

The use of stimuli must be closely watched, with constant reference to the state of the circulation. The quantity should be lessened when reaction has begun, and they should be withdrawn as that proceeds, fluid nourishment being substituted

When suppuration begins in scalds and burns, the constitutional excitement is sometimes so considerable as to require salines, with antimony and nitre, together with mild regimen.

Local means.—To structures actually disorganized applications can be of no service. Yet even such parts and the entire body should be covered warmly, to prevent chilliness. Cotton-wool is now recognised as the best application for the injured parts and their neighbourhood, its use having been suggested in America by the accidental circumstance of a badly burnt child having been placed on an emergency in a basket of cotton, with which it soon became covered, and then quiet. A tolerably thick layer of the wool should be placed on the burnt or scalded part, and lightly confined by suitable bandages. It completely answers the two important purposes of preserving the heat and taking off pressure from the prominent points in the various attitudes of the body. When this kind of dressing has been properly applied and a suitable stimulus administered, the patient soon becomes easier. He remains at perfect rest, the covering not requiring renewal or change possibly for weeks, at all events not so long as he feels comfortable. If discharge should appear at any point, a little wool may be added in that situation, or a partial renewal of the covering may be advisable. The separation of eschars, and the repair of the surfaces often go on most favorably on this plan, by which the severe suffering from the renewal of dressings and the exposure to the air of extensive denuded and sensitive surfaces is entirely avoided.

The treatment by cotton has nearly superseded a method in very general use previously, having been introduced by Mr. Kentish of Newcastle, who had seen much of the worst burns in the collieries of that district. In this plan, which

may be said to have answered its purpose well, the burnt parts were sponged with oil of turpentine, warm, then covered with a liniment of resin ointment and oil of turpentine. The dressings, confined by light bandages, were not to be renewed so long as the patient continued comfortable. When fresh dressings were applied, care was taken not to chill the parts by opening the whole at once, or leaving the parts open.

Poultices of linseed or bread are useful when the separation of sloughs is going on. The large destruction of the skin leaves extensive granulating surfaces, with copious discharge, of which the cicatrization is extremely tedious. When these are painful, powdered chalk or calamine, with some opium, may be strewed over the surface. A good, nutritious diet is necessary to sustain constitutional power. Profuse discharge is sometimes advantageously checked by astringent solutions. Where mortification does not extend through the entire depth of the skin, cicatrization is accomplished rapidly, as it begins and proceeds over the entire surface at one and the same time; on the other hand, there is exuberant granulation with tardy cicatrization where the skin is wholly destroyed and the injury extends to the subjacent cellular stratum. Here pressure, with escharotics to the elevated margin of the sore are required.

When burns with much loss of substance occur in the face, lower jaw, neck and chest, or on the limbs in their flexures, the cicatrices, in proportion as they contract and acquire solidity, displace and alter the form of the moveable parts within their range, so as to cause distressing deformity often with great imperfection of movement. Change in the form and position of the eyelids involves injurious exposure of the eyeball; the entrance of the nostrils may be contracted, with destruction of the alæ nasi; the lower lip and the jaw may be

everted and drawn down on the chest, with constant escape of saliva, and inability to close the mouth, or to move the head except in slight degree. The movements of an upper limb may be lost by the arm becoming fixed to the side of the chest, and that of a joint may be rendered imperfect by a cicatrix over it in the form of a bridle. These evils may be partially remedied for a time by cutting through the cicatrix, but they return as the incision heals. Very slow and gradual extension by means of instruments is the best mode of treatment. The position of parts should be closely watched during the progress of healing, so as to omit no precaution calculated to prevent or to lessen the extent of mischief so serious.

CAUTERIES, ACTUAL AND POTENTIAL.

Several powerful agents, capable of disorganizing the parts to which they may be applied, have been employed in the practice of surgery at different times. The most potent of these, iron instruments called cauteries, raised to the highest degree of heat, were so commonly in use heretofore, that a chafing dish with burning charcoal and the requisite instrumental supply was regularly carried round with the surgeon on his ordinary hospital visits. Although these rough means have for a long time given way to the milder treatment suggested by an improved pathology and therapeutic system, they are still in occasional use. They are undoubtedly powerful agents, although our confidence in them is not so strong as that expressed in the old statement—"Quod medicamenta non sanat, ferrum sanat, quod ferrum non sanat, ignis sanat, quod ignis non sanat, id prorsus insanabile est." They are still more frequently used on the continent than by English

practitioners. The hot iron is used in two degrees of heat, the highest or white, a lower or red heat. The former destroys instantaneously, and is said to give less pain than the latter. As its necessary proximity in action to the surrounding parts would injure them, they should be protected by some layers of wetted paper, in which a hole is cut to expose the part requiring the cautery. The red heat will often suffice; and its transient application in this degree will sometimes enable us to accomplish, in an easy manner, effective but extremely superficial disorganization. An infant under eight weeks of age had one side of the face and lower jaw, with part of the ear, covered by a thin nævus, which had spread to this extent from a small spot observed near the nose soon after birth. It was confined to the skin, not forming one mass, but in separate portions, scattered irregularly over the space mentioned, and communicating by vascular ramifications. It was completely destroyed by a red iron passed quickly over the principal portions, and leaving light-brown marks behind. I saw the child a few years after, and should hardly have known that anything had been done to the face if I had not been reminded of it. Cases of nævus are not unfrequent in which this method might be resorted to with advantage. An anæsthetic might be employed if this powerful mode of revulsion were objected to simply from the dread of pain.

A more frequent form of actual cautery is the moxa, a treatment imitated from the Chinese, who use the downy substance derived from an Artemisia, compressed and formed into cones, which are placed on the part, lighted at the apex, and allowed to burn out on the skin. We employ cotton dipped in solution of nitre; when dried, it is compressed so as to form cylinders about an inch in length and from half an inch to an inch in diameter, kept in their proper form by a bit of linen or calico, of which the ends are sewn together,

This is held on the part by a small instrument with a ring of metal and a wooden handle. It is ignited at the top, and may be kept in strong combustion by the blowpipe until it is burnt out, when the portion of skin is reduced to a brownish eschar, and there is considerable redness to a greater or less extent in the circumference.

Pure potash, fused and formed into sticks for convenience of application, is employed either to destroy morbid growths or diseased surfaces, or to disorganize a portion of skin for the establishment of an issue. It quickly destroys the tissues, reducing them to a dirty brownish pulp, and the destruction may be carried to any desired depth by wiping away the disintegrated tissues with lint, and then renewing the application. Its great deliquescence, which would extend the escharotic action further than we might wish, must be guarded against. Thus, in making an issue, we put together two or three portions of adhesive plaster, and cut a hole in the centre of the required size of the issue, and rub this part sufficiently with the caustic. A piece of plaster is then put over it, the whole is removed in three or four hours, and a poultice is substituted, which is to be continued until the eschar is separated. In another mode of proceeding, sometimes preferred, the pure potash is combined with an equal proportion of quick lime, which is a caustic like the potash, but not used alone in surgery. The two powders are to be rubbed together and put into a stoppered bottle. When required for use the desired quantity is moistened by alcohol, so as to form a mass called Vienna paste. This is a new name for an old remedy, the combination of quick lime with pure potash having been well-known in the hospitals of London at least from the very beginning of the present century under the name of Calx cum Kali puro, or paste caustic, soft soap having been employed instead of alcohol to make the

powders into a paste. For making an issue a portion of this paste, as thick, at least, as a half-crown, is placed in the hole cut in the plaster, then covered over, and the whole left on for six or eight hours.

The nitrate of silver, although in such general and daily use that the simple term caustic is understood both by surgeons and others to designate this substance, is not as Mr. Higginbottom has justly observed, an escharotic. When effectively applied in substance or in strong solution, it may but does not always, vesicate, without acting more deeply. When applied to a moist surface, as that of a mucous membrane or an ulcer, it is immediately decomposed by the common salt found in all animal fluids, and converted into a muriate of silver, characterised by its white colour. It is thus that it may be taken into the stomach with impunity in large doses. Its astringent action on the minute vessels of the skin and of other structures to which it is applied is so unequivocally advantageous, that it is probably the most general and useful of all surgical applications. The solution in distilled water is a convenient form of the remedy, varying in strength from one or two grains to the ounce, the latter being the most common, to that of twenty or even thirty grains to a drachm. As the action of the remedy is quite superficial, the last-mentioned twenty-grain solution may be applied by means of a camel-hair brush with perfect safety to more or less extensive surfaces, the skin having been first cleared by effective ablution.

The chloride of zinc, introduced of late years, is so powerful an escharotic that it is seldom used alone, though it does not act through the cuticle. It is most commonly combined with an equal proportion of plaster of Paris (sulphate of lime) or wheat flour. The powder is mixed, at the time of using, with water, so as to form a paste, which may be spread on

lint to a greater or less thickness, according to the depth of structures which it may be wished to destroy. Its advantages are that, in this way, it may be made to act deeply, that it exerts no other injurious action, locally nor constitutionally, so that it is free from the dangers inseparable from the use of arsenical caustics. The whitish-brown adherent eschar which it forms separates favorably under poulticing, and is succeeded by a healthy granulating surface. The great disadvantage is in the extremely severe pain attendant on the process. A violent disturbance is excited in the part and neighbourhood, with vivid redness, sense of heat and burning almost intolerable, equally uncontrollable by warm or cold applications, though the latter, including iced water or freezing mixtures, are, perhaps, the most serviceable. This pain may last for many hours in spite of opiates. It is sometimes used in solution for the destruction of a painful, malignant ulceration, as in cancer. The fluid of the late Sir W. Burnett, for the preservation of sails and cordage, is a solution of this chloride, and answers the purpose very well for employment in this way, either in its ordinary strength or somewhat diluted.

Of late years the cancer curers have substituted this chloride for the dangerous arsenical preparations formerly employed. A morbid mass may be destroyed by it in some time and with great suffering, being succeeded by a healthy granulation and cicatrization. This is called a cure, though cancerous induration is commonly either left in the circumference at the time or quickly developed after the so-called cure. An American quack of this kind made many dupes in England a few years ago, by colouring it with the red juice of an American plant (*Sanguinaria Canadensis.*)

The liquid perchloride of iron is a recent and valuable addition to the resources of surgery in various ways. In

full strength it is a powerful escharotic, quickly disorganizing and blackening the textures to which it is applied, though not acting through the cuticle. It will thus advantageously supersede the actual cautery as a means of arresting hæmorrhage. Even when considerably diluted it coagulates albumen and thus affords assistance in stopping bleeding.

The acid nitrate of mercury, in which the metal is dissolved by the aid of heat in an excess of acid, is an escharotic fluid used in France, being applied by means of a camel-hair brush. It is less potent than the perchloride of iron.

Arsenious acid (white arsenic) is a powerful escharotic, capable of destroying parts to which it is applied, producing a brownish-white, tough slough, on the separation of which a healthy granulating surface follows. The possibility of its absorption and consequent poisonous action is the strongest objection to its employment for purposes which can be answered equally well by other agents of perfectly safe character.

Nitric, muriatic, sulphuric acids, and the chloride of antimony, are powerful escharotics, of which the destructive action is not attended with any other danger to the part or to the constitution. The latter, however, is almost out of use, although its effect is said to be produced without great pain.

CHAPTER XIV.

SYMPATHETIC EFFECTS OF LOCAL INJURIES, IMMEDIATE AND REMOTE—DELIRIUM TREMENS—TETANUS.

Although I have already spoken of the general disturbance excited by local inflammations as an essential part of their history, and of the changes and varieties they exhibit in connexion with the progress and various results of such affections, several points of more or less importance connected particularly with the effects of local injuries still remain for consideration.

Injuries not unfrequently produce immediate disturbance of the circulation; there is depression of the pulse, sometimes actual fainting, with coldness and paleness of the surface. Rest, with or without gentle stimuli, soon removes these symptoms, which are usually transitory. They are, however, sometimes produced by the most trifling causes, such as introducing a bougie or by a wound with a little bleeding, while the most serious accidents may occur without such an effect. The stomach may suffer, sickness and even vomiting coming on. I saw a poor woman who had hurt the last phalanx of the forefinger by the end of a needle which had penetrated the skin. The part swelled a little and became painful. She was soon sick, and passed the night without rest, retching and vomiting from time to time. She vomited while I examined

the part next day. I cut down to the bone with immediate relief, the part being swelled and tense, and she recovered quickly. Chills and shivering, rigors in technical language, sometimes occur; an effect referable to the muscular system, though we do not see clearly how the influence is brought about. The case is more unequivocal in tetanus, which does not come on until some days after the injury.

Delirium tremens.—There is a great and violent shock of the nervous system in gunshot wounds, bad burns, and other very serious injuries, accompanied or soon followed by depression of the circulation. In less serious cases there is temporary agitation, anxiety, and alarm. In some instances, either of serious or comparatively unalarming character, there may have been nothing unfavorable at the time or for some days after an accident, when a peculiar disturbance of the nervous system begins to show itself. The patient, who has been without complaint, becomes uneasy and restless, being at the same time talkative. He moves about without apparent purpose, and would be described as fidgety. He becomes rambling and incoherent, and soon delirious. If not watched, he would get out of bed, although with a fractured limb, wanting, as he says, to go home. He fancies that he sees strange persons or beings in the room, or that he is pursued by the police. There is total want of sleep. The pulse is accelerated, but feeble or not strong. The head may be heated and perspiring, and there is often copious general perspiration from the violent efforts and movements of the patient. The two leading features of this singular affection, which is not unfrequent in the cases of accident brought into the London hospitals, are aptly denoted by its name, delirium tremens. In reference to the habits and state of constitution which predispose to this affection, it may be observed that a large proportion of those accidents have occurred to persons in a

state of drunkenness, and consequently that the complaint is much more frequent in males than in females. It occurs not unfrequently in great drinkers, especially of ardent spirits, without any exciting cause, as a spontaneous affection, so that the name of traumatic delirium, under which it is spoken of by Dupuytren, gives too limited a view of the subject. In the London hospitals it is seen principally in those who, working hard and earning good wages, are enabled to indulge their appetites without restraint, especially with animal food, gin, and porter, of which latter they frequently swallow excessive quantities daily. In the great London breweries I have understood they are allowed to drink as much as they please. When received into an hospital on account of accident, the supply of stimulus is at once cut off, and they are reduced to a slender diet, consisting partly, however, of milk and bread, both of the best quality. The brain soon feels the effect of the change inevitably produced under these circumstances in the condition and movement of the circulating fluid, the unfavorable influence being probably increased by inactivity in bed, and manifested unequivocally in the spirits, temper, and want of rest, or in the more or less violent derangement of the mental faculties and moving powers. Our experience of these effects leads us to adopt preventive measures in the first instance, when their occurrence might otherwise be anticipated. Thus, we often allow such patients from the beginning meat diet and porter, sometimes with a glass of gin and water at bed-time, thus maintaining a condition of general health more favorable to the performance of the necessary restorative processes than could be expected under the strict regimen which has been often enjoined. The same principle must guide our treatment throughout the progress of such cases, especially when the repair of extensive injuries requires a long confinement. The sisters and nurses of our

accident wards become well acquainted with this affection by constant observation, and thus sometimes put us on our guard by noticing its earliest symptoms, when preventive measures can be adopted with the best effect.

The treatment of delirium tremens turns on two points, the use of stimuli and that of opiates. The former is the most important in the early stage, when it may possibly supersede the necessity of resorting to the latter. When, however, the want of sleep has come on in the full development of the complaint, opium must be resorted to, and must be used freely, as the nervous system is less amenable to its influence than under other circumstances. It is often necessary to increase the dose after smaller quantities to a drachm of laudanum or a grain of morphine. The tartrite of antimony may be advantageously combined with opium; half a grain of this substance, with a moderate dose of opium, will do more good than double the quantity of the latter medicine alone. I have seen a grain of the tartrite in the same combination calm the nervous system completely when the smaller quantity had failed.

It is certainly advisable to avoid the large and repeated doses of opium which have sometimes been necessary in the treatment of this affection. The late Mr. Jones, of Jersey, thought that he had discovered the required substitute in large doses of tincture of digitalis, and has published several cases in which the plan has been completely successful. He gave half an ounce of the tincture, and repeated the dose, if necessary, in a few hours. It is interesting to know that we can give in such large quantities a remedy which we have been accustomed to think it necessary to watch closely when administered in doses of a few drops. Mr. Jones has not given more than two half-ounce doses in any one case, reducing the quantity when he

has found it advisable to persevere with the remedy. This plan of treatment has been followed by others, without doing harm in any case, but not with invariable success. To a female, about fifty, with a bad fracture of the leg, by whom two or three large doses of laudanum had been taken without effect, I gave three drachms of the tincture, which quieted her immediately and permanently, inducing a tranquil state of the circulation, under which recovery went on most favorably.

Dupuytren treated this complaint with laudanum injected into the rectum in the quantity of ten drops, which he seems to have found constantly successful. I have no experience of this treatment. It is hardly necessary to give a caution against confounding this drunkard's delirium with that of fever. The latter is preceded for some time, probably a few days, by actual fever; in the former delirium is the first symptom, and such constitutional disturbance as may take place is secondary. The violent restlessness and incessant agitation of the former do not take place in the latter.

TETANUS.

A serious affection of the muscular and nervous system, under this name, is observed as a remote consequence of local injury. The word tetanus, which is of Greek extraction, means tension or contraction; and tetanus may be defined as a state of spasm or permanent contraction of some portion or the whole of the voluntary muscles; rigiditas spastica is the expression of Cullen. When we say permanent contraction, the expression must be understood with some limitation. The state of the voluntary muscles in this disease is, generally, that of spasm, but there are paroxysms of convulsions; there is occasional relaxation of the muscles, and such is their state in sleep. We cannot, therefore, say that the voluntary muscles are permanently contracted through the whole period that this affection lasts. The state may be

considered permanent when the intervals of even partial relaxation are rare and distant.

Tetanus may be either partial or general. When the muscles of the jaw alone are affected, the case is called *trismus* or, in popular language, *locked-jaw*. And this latter term, is used as a common phrase to denote tetanus, without meaning that the affection is confined to the muscles of the jaw.

When the muscles of the back part of the trunk are affected so as to bend the body backwards, it is called opisthotonos. This does not occur as a distinct and exclusive affection; the rigidity of the back is merely a part of the general disorder. The terms emprosthotonos and pleurosthotonos are given to what may be termed imaginary conditions, in which the body is said to be bent either forwards or to the side.

Tetanus is either *idiopathic* or the result of injury, in the latter case it is called *traumatic* or *sympathetic*. The progress of the affection varies in rapidity, and hence it is divided into acute and chronic. In some cases the disease is less acute than in others, but it never lasts very long. The distinction into *acute* and *chronic* is less marked than in inflammation.

Idiopathic tetanus is rare in this country. During the last thirty years I cannot recall in my own experience more than two cases, in both of which the affection partook of the chronic character, and was nearly limited to the muscles of the face, neck, and spine. The pulse was hard, the tongue furred, and the bowels constipated. The patients ultimately recovered after active treatment, in which purging was a prominent remedy. Idiopathic tetanus, however, belongs to the department of the physician; my subject is the sympathetic or traumatic form of the affection.

Traumatic tetanus, as the name implies, is consequent on

injuries, particularly of the extremities, more rarely of the head, neck, or trunk. I saw it, however, once in a wound of the nose of unimportant character; the integument on the convexity of the organ was divided down to the bone by a fall from the horse, when the face came in contact with the ground in a gravelled road. The patient, a gentleman about fifty, was in good health at the time, and the apparently trivial wound was granulating quite favorably. It is caused most frequently by contused, lacerated, or punctured wounds. It has been supposed to arise, more especially, from injuries of nerves, but these organs are involved in all wounds of soft parts.

It has been fancied that tetanus may arise from a nerve having been included with an artery in a ligature. This is probably an imaginary notion. At all events, tetanus rarely occurs in these climates after operations, although nerves must often be included in the same ligature with arteries.*

Tetanus may occur in all states or stages of a wound, when it is inflamed or sloughing, going on favorably, or when the process of repair is more or less advanced. The obvious inference from these circumstances is that the complaint does not depend on the nature or condition of the wound, but on something not yet ascertained in the state of the patient. Sir James Macgrigor, in his "Surgical History of the English Army in the Campaigns of Spain and Portugal" ('Medico-Chirurgical Transactions,' vol. vi), observed that tetanus occurred in all descriptions of wounds, from the slightest to the most formidable, and in all states, from the worst to the most favorable condition, even in that of healing. It does not appear until after a few days, from five to fifteen, according to Larrey. Sir James Macgrigor

* In a case of tetanus at St. Bartholomew's Hospital, following a wound of the finger, the injured member was amputated, and on its examination a small splinter of wood was found imbedded in the digital nerve.

considered that wounded persons were in no danger from this alarming malady after twenty-two days. It is more common in hot than in cold climates, but is not a frequent complication. In the Schleswig-Holstein war Stromeyer had only six cases in a list of 2000 wounded. In the Hôtel Dieu, in July, 1830, they had but one case of tetanus among the 390 patients wounded by gunshot. During the war in the Crimea its infrequency was remarked. Mr. Macleod knew of only six cases which occurred in camp, and of seven at Scutari ('Notes on the Surgery of the Crimean War,' p. 153). Of the former, one followed a compound fracture of the thigh, one a face wound with destruction of the eye, one an amputation at the shoulder, one a flesh wound of the leg, and the other two occurred in wounds of the thigh without fracture. Sudden vicissitudes of temperature have been looked upon as powerful causes of tetanus, especially the change from a hot day to a cold and damp night. Such was the case in India after the battles of Ferozepore and Chillianwallah, when the wounded lay exposed to cold nights after days of great exertion under a burning sun. The same fact was noticed by Larrey in the German campaign of 1809.

The prevalence of tetanus, both idiopathic and traumatic, in hot climates, and particularly in the West Indies, where heat is looked upon as a predisposing and exciting cause, has been noticed by Sir Gilbert Blane, who remarked that of 810 wounded men who came under his observation in that part of the world in 1782, thirty were seized with tetanus, and seventeen died; while the influence of the opposite condition, that of extreme cold, was noticed by Dr. Kane, who tells us that while most of his party were more or less affected, he lost two men from an "anomalous spasmodic affection allied to tetanus, and that all his dogs perished from a like cause."

Symptoms and course of the disease.—The muscles first affected are those of the jaw, face, and deglutition. There is stiffness of these parts, soon passing into more or less complete rigidity. The two rows of teeth are either held close together, or separable only in a slight degree. There is a peculiar fixed and characteristic expression of countenance, caused by the involuntary action of the muscles on the moveable parts of the face, altogether at variance with the state and feelings of the patient, and hence called risus sardonicus. This facial spasm, together with that of the masseter and temporal muscles, keeps the mouth closed. Swallowing is difficult, and occasionally hardly practicable for a time. The back of the neck soon becomes rigid. A peculiar sensation is experienced behind the ensiform cartilage, from which pain shoots to the back. This is nearly, if not always, present. The muscles of the spine and those of the abdomen then become rigid; the walls of the latter are as hard as a board, while the head and spine are so forcibly bent backwards that the body rests in the recumbent position on the occiput and pelvis. Lastly, the affection involves the limbs, so as now to include the whole voluntary muscular system, with the addition of the diaphragm, if the pain behind the ensiform cartilage depends on the state of that muscle. The disease seems to destroy life by exhaustion of the nervous power, but it may be suddenly fatal by spasm of the larynx or the heart.

The state of the affected muscles is generally that of contraction and rigidity, but convulsions or movements of violent and irregular character are brought on by slight causes, and are of the most painful kind. You can estimate this suffering by knowing the pain of cramp in the calf of the leg, which lasts only for a few seconds, and supposing this to affect the whole frame, and to be continued. The state of rigidity is attended

with suffering, which, although great, is less than the agony of the convulsive paroxysms, which rapidly exhaust the patient. They have been called clonic, in contrast with the tonic or permanent spasm. The functions of the nervous system are nearly unimpaired. Cullen represents that the natural functions, those of the vascular, respiratory, and digestive systems are not disturbed. He states particularly that the circulation is not affected, that the blood is not altered, or, if changed at all, rather loose in consistence; that the appetite is not impaired, and that the functions of the digestive organs are performed regularly. This representation differs so entirely from the course of my own experience, that I can hardly suppose it to have been drawn from actual observation. The blood, instead of being loose in consistence, may be buffed and cupped. There is loss of appetite, with obstinate costiveness, considerable difficulty being experienced in obviating the latter. In the commencement of the affection the pulse, particularly in young and robust persons, is strong, and accelerated, rising from 100 to 120. The pulse, as well as the respiration, is accelerated in the convulsive attacks, when the patient is covered with profuse sweat.

The violent spasms sometimes cause considerable local mischief, such as rupture of muscles, particularly the rectus abdominis, ecchymosis in the abdominal walls, about the fundus or sides of the bladder, or in the subperitoneal tissue.

Examinations after death fail to disclose any morbid changes that are either constant or characteristic; they do not enable us even to localize the disease in any organ or system. There may be in some instances subserous infiltration in the brain and increased quantity of fluid round the spinal cord, and we may sometimes fancy that the latter is softened, but on other occasions these changes are not observed.

The pathology of tetanus, therefore, still remains obscure. We naturally look to the spinal cord and the medulla oblongata, but discover no clear evidence in these quarters. The voluntary muscles are obviously influenced sympathetically by the local injury through the medium of the nervous system; but we have not hitherto discovered how the spinal cord or other part of the nervous apparatus is affected, nor what is the source or character of the influence disturbing it. Costiveness, which has been observed as a marked feature of the affection by Boyer, has been present generally, if not invariably, and to a high degree, in the cases which have fallen under my own observation. Mr. Abernethy proposes the question, What is the state of the stomach and digestive organs between the receipt of the injury and the occurrence of tetanus? thereby implying the opinion that a loaded state of the alimentary canal may be one source of the mischief. Great alleviation of the spasms, and sometimes their complete temporary subsidence, are produced by an effective clearance of the large accumulations, which often fill the intestines at the time of the attack.

The prognosis is always very serious in traumatic tetanus, but much less so in the idiopathic form which is common in hot countries, where it often ends favorably; hence confidence in treatment and expectations of success are stronger in the latter than in the former. The more acute the form of the disease the more dangerous, and *vice versâ*. Hippocrates observed that if the patient survives the fourth day the chances are better, and Dr. Parry states that if the pulse does not exceed 100 or 110 on the fourth day there are great hopes ('Cases of Tetanus,' &c., 1814).

Treatment.—The first question is, considering that the symptoms are the consequence of a local cause, will the removal of the cause put a stop to them? In other words,

will the amputation of a finger, a thumb, or any other part, arrest the symptoms, and put a stop to the complaint? We may, I believe, say confidently that it will have no such effect. Tetanus may occur when a wound is in a healing state, and making rapid progress to a cure. No doubt the complaint owes its origin to some condition of the wound and health prior to this healing state; consequently the removal of the part would be useless. Yet amputation of the extremity in which it may be situated has been proposed, even in late times, and by those whose authority is considered high in surgery; more particularly by Larrey, who recommends it in the surgical history of his military campaigns. He, however, adds, that it is only proper in cases of chronic tetanus, or at the very commencement of the symptoms in those of a more acute kind. He adduces but few cases, and even these do not furnish conclusive evidence on the point. It has been tried in some instances without satisfactory results. Perhaps, however, we should not be warranted in condemning it absolutely. There could be no objection to removing a finger, if in a bad and painful state, on the first appearance of alarming symptoms.

From the great diversity and even directly opposite plans of treatment which have been and still are resorted to in this disease, we may conclude that no one method has hitherto received the general assent and sanction of the profession. The extremes include bleeding and purging on one hand, quinine, iron, and diffusible stimuli on the other. Differences in constitution and previous health, and the period of the affection, will account for something in this variety, but not for the complete therapeutic contrast, from which we can only draw the conclusion that the pathology of the affection is not yet ascertained. The state of the voluntary muscles has naturally led to the employment of anti-spasmodics, and especially of the

most powerful of the class. Thus the treatment of tetanus has generally turned, in part at least, on the exhibition of opium. In tetanus the nervous system is less influenced by opium and other antispasmodics than under other circumstances, and thus they have sometimes been borne in very large doses without good or obviously bad effects. Dr. Babington gave 180 grains of opium in eleven hours, and an ounce of tincture of opium in twenty-four hours. The history of idiopathic tetanus affords many instances in which the free use of opium has been said to have cured. It has not the same beneficial result in the sympathetic form of the complaint.

Bloodletting has been resorted to in tetanus, particularly in the early stage. Patients have been bled largely, and, in some cases, the blood has been buffed and cupped. Hence bloodletting may perhaps be a useful auxiliary remedy in some cases, although, considered alone, it is not capable of accomplishing the purposes we have in view.

Mercury has been employed freely, so as to produce salivation, frictions having been employed for this purpose. This does no good; indeed, in some instances tetanus has come on when the patients were under salivation at the time.

The powerfully relaxing or depressing effect which tobacco exercises over the nerves and the muscular system has led to the employment of it in the form of clyster. This dangerous remedy has been of no service.

Musk, camphor, and ether, have been exhibited in large doses; in fact, all in such doses as are supposed to exert a power over the muscular and nervous system.

Bark, wine, tonics, and stimuli of all kinds, have been given very freely.

If we were merely to look over the recorded cases of tetanus, observing the means that have been employed and

their effects, we should feel totally at a loss for any principle to guide us in the treatment of this affection. It appears to me that those cases have done best in which active aperients have been administered from time to time, so as to remedy the state of costiveness which exists at the commencement of the disease, and to prevent its recurrence, and in which at the same time opiates have been employed to mitigate the severity of the spasm. In some instances successful results have been procured by acting steadily on this plan. The points of treatment, therefore, on which I place reliance myself are, first, the free exhibition of aperient medicines, particularly the croton oil, most convenient from its activity in so small a dose and the consequent facility of administration, in order to unload the canal in the first instance and afterwards to prevent reaccumulation, and the use of such narcotics as may be sufficient to procure ease by controlling the spasms. Half a dram of laudanum, with or without a dram of the tincture of hyoscyamus, will generally be sufficient when the bowels have been evacuated, a fresh dose being administered as soon as the influence of the former on the spasms has ceased. In an exceptional case, such as that of a robust person with a full and strong pulse, a venesection in the first instance might be of service.

Some years ago I was called to a case of tetanus under circumstances of imminent danger, where this plan of treatment was completely successful. It was that of a gentleman about fifty years of age, a robust man, of full habit, accustomed to free living, of very active mind, with various and important business on his hands at the time. The attack of tetanus occurred in the hottest time of the year. He was riding, when the horse fell, throwing him forwards, and his face came on the ground, so as to graze the dorsum of the nose, making a slight wound. He thought so little of the

accident that he did not discontinue his ordinary pursuits nor change his usual mode of living. The wound had just gone through the skin, and was very slight. At the end of about ten days, when it seemed on the point of healing, on sitting down to the table with some friends, he felt that he could not move his jaws freely. He had some difficulty in masticating and in swallowing his food. He was induced, by the importunity of his relations, rather than by his own feelings, to send for a medical person, who took a little blood from the arm, and gave him some opening medicine. He was worse the next day, when I saw him. At this time the symptoms of tetanus were well marked: spasmodic contraction of the muscles of the jaw; he could not swallow ordinary food; pain behind the sternum, extending through to the spine. His pulse was full and strong, his bowels tolerably open; he had been bled, and taken opening medicine the day before. I told him he must go to bed, for he was then sitting up. He was bled, and I prescribed an active aperient. The blood was buffed and cupped, the opening medicine had acted powerfully, and he was better on the next day. Being desirous of producing still further action on the alimentary canal, I ordered a large dose of calomel and jalap, and that was followed up with a draught of the infusion of senna with salts. On this occasion, however, the medicine produced no effect. The medical gentleman in attendance gave him castor oil, which did not act; he then repeated the aperient draught, and gave a clyster. When I saw him on the next day, these means had not operated; I therefore directed immediately the administration of croton oil. He took a single drop in a teaspoonful of gruel. In an hour such an immense action occurred, and he discharged such a quantity of fecal matter as altogether astonished himself and all about him. He filled the close stool pan com-

pletely. This was followed by relaxation of the rigid muscles and considerable relief of all the symptoms, but the complaint went on, and proceeded to the full development of tetanus over the whole body. The treatment of the case from this time consisted in the regular administration every day of croton oil, so as to ensure free action of the bowels. In the first instance a single drop produced this effect, but after some time it was necessary to give a drop and a half. The evacuations that were produced by this medicine were very copious indeed, and it was observed by the medical gentleman in attendance that "we had got the secret in reference to tetanus." The muscles that before were rigidly contracted became comparatively relaxed at the time. The tetanic affection, however, proceeded until all the voluntary muscles became affected to as high a degree as I ever saw. The patient lay frequently for a considerable time with the limbs completely rigid, and then would have attacks of the most severe convulsions. It was necessary to exhibit opium, in order to control the attacks of spasm. Although in instances where opium has been trusted to alone it has failed to produce this effect, moderate doses in this case would suspend the paroxysms of convulsion for some hours, when it was necessary to repeat the dose.

The use of opium in tetanus is not confined to the administration of the tincture, the solid drug, or morphine. The latter substance has been applied in powder to the surface of the skin over the vertebral column, previously denuded by blistering, I believe, without any particular advantage. The rapid and effectual manner in which the hypodermic injection of this remedy removes the severest pains without any injurious influence on the head or stomach strongly recommends its use in some cases of tetanus. The violence of the spasms has, in some instances, been controlled by

this method of administering an opiate. The brain becomes quieted, and some hours of sound sleep may be procured, but unfortunately without influencing the progress of the disease. William D—, aged sixty, was admitted into St. George's Hospital, November 5th, 1858, with a gun-shot wound of the thigh. On the 13th he had a little wandering delirium. On the 14th trismus and other symptoms of tetanus supervened, and gradually increased during the two following days. On the 16th, at half-past 12 p.m., three quarters of a grain of morphine were injected in five drops of liquid. He was asleep in twenty-five minutes, and remained so for the greater part of the night, totally undisturbed by the tetanic spasms, which recurred nearly every minute. Death finally ensued. ('Med. Times and Gazette,' March 5th and April 16th, 1859.)

The *Cannabis indica* has been employed at Guy's Hospital in 1858 by Mr. Cock and Dr. Wilks, but "the cure was attributed more to the quantity of wine and beef tea taken than to the medicine."

The powerful influence which anæsthetics, chloroform particularly, are capable of exerting on the nervous and muscular systems, has naturally led to their being tried in tetanus. Some temporary ease, but no permanent benefit, has been experienced from them, while they seem to have been rather injurious on other occasions. A gentleman between forty and fifty had a bad gunshot wound of the foot; an entire charge of shot entered just above the heel from the muzzle of a fowling-piece, nearly in contact with the part. The charge went through the sole from behind forwards, coming out in a mass between the great toe and the second, without breaking any bone or injuring the external parts, except at the entrance and exit of the charge. Nothing unfavorable had occurred in the foot, which had

been kept perfectly at rest, when, on the sixth or seventh day, tetanus came on in a most alarming form in the jaws and muscles of deglutition, with entire inability to swallow. This distressing condition was completely removed by the use of chloroform, after which swallowing was quite easy, and the system was so far tranquillised as to give a more favorable impression of the case. Although the improvement lasted several hours, the hopes thus excited proved illusive, the symptoms returning with great violence, and proving fatal in less than forty-eight hours from the first outbreak. Some practitioners have relied chiefly on tonic and stimulating treatment, carrying it to a great extent by large doses of quinine and carbonate of iron, with or without beer, wine, spirits, and medicinal stimuli and cordials. The severe and almost incessant suffering inseparable from the complaint soon brings on great general weakness, under which the free use of quinine would be indicated, and certainly unobjectionable, if preceded and accompanied by the attentions to the state of the alimentary canal already enforced. Would it succeed as a sole remedy from the first, and would it supersede the necessity of opiates in dealing with the terrible convulsive paroxysms? The same observations are applicable to the use of iron, of which the carbonate, in its necessarily large doses, would be the most objectionable form where deglutition is difficult. The tincture of the sesquichloride would be more convenient. The employment of diffusible stimuli, under suitable precautions, would be consistent with the use of quinine and iron, and would be advantageous in the weakened condition to which the patient is reduced in the more chronic form of the disease after the greatest danger has passed. I know no evidence that it would be useful or even safe to give beer, wine, and brandy in large quantity from the beginning as the sole or principal treatment.

The warm bath, which has been tried repeatedly, is now disused, from the belief that it is not only inefficacious, but sometimes hurtful, from the movements and disturbance which it involves where perfect rest is of the greatest consequence. In the West Indies cold baths have been extensively employed, with so much success as to have been generally adopted. This statement refers to cases of idiopathic tetanus, so frequent in tropical climates, of which a considerable proportion end favorably under different plans of treatment. The remedy has been employed here in the traumatic form of the disease, not only without benefit, but with clear proof of having hastened the fatal termination.

CHAPTER XV.

SPECIFIC DISEASES.

SCROFULA.

We use this term in two senses, either to designate the peculiar characters which distinguish a certain class of diseases, or to indicate the peculiarity of constitution which is generally original or connate, from which such peculiar character is derived. In the former sense, scrofula is equivalent to scrofulous disease, in the latter to scrofulous constitution. Thus, if we say of a person that he has scrofula, we mean that he labours under some actual disease of scrofulous character. When it is said that scrofula exists in a family, the meaning is that individuals of the family in greater or smaller number, exhibit that original peculiarity or defect of constitution which is called scrofulous, although none of them may be suffering from disease at the time.

The word scrofula is said to be derived from *scrofa*, which is the Latin for a sow; though the ground for the derivation is not apparent. The term *struma*, properly applied to swellings of the neck, is often used as equivalent to scrofula. Popularly, these diseases are often denominated *the evil*, or *the king's evil*, from the belief entertained in former times that the touch of a royal personage would cure them.

There is an insensible transition from common to scrofulous disease; hence the diagnosis is often somewhat uncertain. The word scrofula, indeed, denotes a difference in the character and progress, not in the essential nature of disease. For scrofula consists of inflammation and its various effects, namely, interstitial deposition, enlargement, induration, suppuration, ulceration; with the restorative processes of granulation and cicatrization.

The description of scrofula, therefore, embraces the modifications which these processes undergo in a particular class of subjects, and its treatment consists in various deviations from the ordinary mode of proceeding required by those modifications, and by the constitutional peculiarities on which they are founded.

In comparison with common inflammation, scrofulous is less active and rapid; the inflammatory characters are not so strongly marked. It has not the firm swelling, the bright-red colour, and the acute pain of common inflammation, nor does it, in general, exert so powerful a sympathetic influence on the constitution. Yet we occasionally see, in the scrofulous affections, which, in respect of redness, swelling, heat, and pain, are closely allied to common inflammation, so that the distinction of acute or chronic is applicable to both cases.

Scrofulous suppuration is slow in its progress, increase, and advance to the surface. The skin is extensively detached and thinned before it ulcerates. Scrofulous abscesses are, therefore, generally chronic. The contained fluid is mucous or serous rather than purulent, or it is a very thin pus, with a mixture of flakes and curdy matter.

Scrofulous inflammation seldom terminates in mortification. When it does occur it is not as a consequence of violent inflammation. Without much local disturbance, part of a glandular swelling may be deprived of vitality and converted

into a fibrous, dense kind of substance, which is slowly separated. It is a loss of vitality peculiar to scrofula, and generally associated with suppuration.

Scrofula frequently appears in the form of chronic inflammation. The part is enlarged, perhaps slightly red, sometimes not discoloured. The affection lasts a long time without essentially impairing functions, or at least leading to any serious ill consequence. It is enlargement without important change of structure. Sometimes, however, adventitious deposits of tuberculous character or of cheesy or curdy matter take place.

The formation of tubercles is a common and characteristic form of scrofula, especially in internal organs. These are small grayish or whitish bodies, varying in size from that of a pin's head upwards; tolerably firm, not organized. They are irregularly disseminated, increasing in number, coalescing into groups; they gradually soften, loosen, and are broken up, portions of the tubercular matter coming away. A peculiar kind of suppuration occurs, and thus extensive destruction of parts may ensue, as in the case of the lungs. The tuberculous matter may be deposited in larger and irregular masses, and may be infiltrated in the substance of an organ. In one shape or other this tubercular mischief is incidental to most of the structures and organs of the body.

Scrofulous ulceration is languid and inactive, with thin discharge. The surface of the sore is pale or livid, without granulation. The margin may be smooth, red, and elevated. Sometimes the base is raised a little. The ulcers which remain after a scrofulous abscess are indolent, the cicatrices being more or less raised, puckered, and irregular. Scrofulous sores often go on long with little change.

The parts most susceptible of scrofulous disease are, in the first place, the absorbent glands, more particularly those of the neck and mesentery. The glands of the groin are

rarely affected; and those of the axilla still less frequently. One of the principal exciting causes of scrofulous diseases is exposure to cold; hence it is that the glands of the neck are so frequently the seat of the scrofulous attack. The mesenteric glands suffer from the irritation of the alimentary mucous membrane, to which the scrofulous are very liable, the glandular affection being here secondary, as it is in so many other instances.

The glands suffer in various ways: from inflammation and suppuration, which are most frequently but not always chronic. The skin becomes thin, red, and livid, then ulcerates. Thin pus escapes sometimes with portions of cheesy substance,and a languid, scrofulous ulcer ultimately remains. There may be simple enlargement without pain; the gland is loose, the surrounding cellular texture being unaffected. One gland or several may be affected. The whole chain may be involved under the jaw, from ear to ear, and down the neck, forming great, unsightly swellings, without change in the skin. Sometimes a succession of inflammations, suppurations, and ulcerations, gradually attacks all these glands, leaving the jaw and neck covered with scars. Occasionally there is interstitial deposition of chalky matter, in the glands.

2. Scrofula, in some of its various shapes, attacks other parts of glandular structure, such as the lip, eyelids, female breast, testicle.

3. Mucous membranes, particularly that of the eye, so constantly exposed to all the most powerful external causes of disease; that of the nose, throat, and respiratory organs, and that of the alimentary canal, so easily disordered by irregularities of diet. The urinary mucous surfaces, not being exposed by their situation or office to similar exciting causes, generally escape.

4. The skin, so necessarily exposed to all the external

causes of disorder, and closely connected with subjacent parts which suffer primarily from scrofula, such as the glands of the neck, often suffers from inflammation and ulceration in the scrofulous. It may be the seat of chronic inflammation, with thickening and induration in the tubercular form, proceeding to imperfect suppuration and ulceration. There may be scabbing of the exposed surfaces, with inactivity of the complaint and subsequent return. There may be permanent thickening and discoloration in patches, as consequences of scrofulous eruption in the form of psoriasis, that is rough and red patches, with heat and itching, formation of scales; or fissures, discharge and excoriation. Inflammatory enlargement of the corresponding absorbent glands is likely to happen when such scrofulous eruptions are in an active state.

5. Inflammation of the subcutaneous cellular tissue, and chronic abscess.

6. In the lungs it constitutes tubercular phthisis, the most frequent form of what is popularly called consumption. Other internal organs are less frequently the seat of tubercular disease.

7. The bones and joints are frequently affected by scrofula, causing in the former inflammation, with caries and necrosis; in the latter, disease of the articular extremities, affecting the joints, and called in common language white swelling.

The liability to scrofula does not extend equally throughout the whole of life; it is chiefly confined to the period of growth, at least from the end of suckling to puberty. In many individuals, the whole of this time, is a succession of scrofulous attacks in the absorbent glands, in the eye, ear, skin, bones and joints, and often the disease exists in several of these parts at one and the same time. Puberty puts a stop to these ravages, and when the change in the constitution is accomplished the affections of the glands,

skin, eye, and other parts, soon disappear, and health is restored, with the appearance of strength suitable to the age. After, however, these earlier and chiefly external affections have come to an end, the disease not unfrequently, sooner or later, attacks more important parts, particularly the lungs, the mammary gland or testicle. Thus those persons who, after suffering much from scrofula in their early years, seem to have gained a healthy constitution at puberty, retain so much of the original imperfection as to remain through life more liable to disease than others.

The great predisposing cause of scrofula is original peculiarity or imperfection of constitution. We can have no hesitation in admitting this.

The external marks of scrofula are generally understood to be thinness of the integuments, so that the superficial vessels are distinctly seen ramifying under them. The skin is so thin in some individuals that the course and ramifications of the subjacent vessels, and the colour of the contained blood, are quite discernible. The upper lip is thick, the eyelids red, the muscular flesh soft and flaccid. These circumstances are more or less observable in scrofulous subjects; but it is not so easy to explain the nature of that peculiarity which we designate as the scrofulous constitution, diathesis, or disposition. Although the general outward appearances are in many instances unmistakeable, the deviations from the normal state of structural elements, if there are any such, have not yet been ascertained. Variety is the law of nature throughout the whole range of organized beings, and exists to its greatest extent in the bodily form and vital actions of our species. Each individual has something peculiar to himself in feature, form, corporeal and mental endowments. Some of these diversities are found in different degrees in so large a number of persons as to admit of their being grouped to-

gether, and we might rationally expect to find that susceptibility to particular forms of disease would belong to such a group. In many parts of Europe the scrofulous would form a large assemblage. Two kinds of constitution, in some respects considerably different from each other, may be observed in scrofulous persons. In one there is a pale and bloated countenance, which is languid and inexpressive, a large abdomen and flaccid muscles, a feeble circulation, with cold extremities. There is general languor in the bodily and mental functions. In the other there is much colour, great vivacity and irritability. The circulation is active, and easily accelerated. Both body and mind are active, often with early intellectual development and quick susceptibility of external influences.

It has been inquired whether fair or dark persons are the most subject to scrofulous disease. In forming a conjecture on this point from what may come casually under our observation, we must remember that the fair-haired predominate in the population of England. The result of our observations is, that it occurs in all complexions and all temperaments, and may be seen in negroes, at least when they are living in this country.

I cannot agree in opinion with those who consider that the nature of scrofula is sufficiently explained as a state of debility. That word has its own signification in pathology, denoting the impaired state of vital power consequent on great injuries, serious and long-continued diseases. In the majority of cases this is a temporary condition, and gradually disappears under the restorative power of the constitution with suitable management. Speaking generally, scrofulous persons are weaker than those of sound constitution; they cannot perform the same amount of violent or continued exertion as those of sound constitution. External agencies affect them more

powerfully; they are less able to resist cold and other depressing influences.

The marks of scrofula may be observed at an early age; they are original and hereditary. The latter term applies to the constitutional disposition, not to the disease. A person of scrofulous constitution may escape disease altogether under favorable circumstances and with great care; sometimes, however, all precautions are unavailing. The offspring of scrofulous parents is not necessarily scrofulous; we often see differences in this respect between the different children of the same family. When both parents are scrofulous it is highly probable that the children will have the same constitution; when one parent only is affected, the children may or may not escape. The chances are more unfavorable in marriages of consanguinity.

The most powerful among the exciting causes is cold, especially when combined with moisture, exposure to cold winds, with snow and rain, fogs, and great vicissitudes of atmospheric temperature. Scrofula, therefore, is most prevalent in cold, damp, and variable climates, such as that of Great Britain, the north of France, and Germany, and the still more northern parts of Europe. The late Professor Beer has stated that in Vienna nine tenths of the ophthalmiæ of children are scrofulous; Benedict gives a similar proportion for Breslau. The late Dr. Gregory stated in his lectures that there was not a family in Scotland totally exempt from scrofula. An analogous representation is made by M. Guersent, so long the physician of the hospital for sick children in Paris. He says, "We may almost affirm that in our great cities no numerous family will be found in which, on tracing the pedigree upwards and downwards, we shall not meet with phthisical or scrofulous subjects." ('Dict. de Médecine,' vol. xix, p. 191.)

Dr. J. Thomson says: "In this climate, at least, I think it may be fairly doubted whether there be any individuals who, in some period or other of their lives, are not liable to attacks of scrofula in some of the various forms which it assumes." ('Lectures on Inflammation,' p. 163.) If these representations should be admitted as well founded, it would save us the trouble of attempting to point out the external marks of scrofula, or to investigate its real nature.

It is comparatively unfrequent in warm climates, though by no means unknown in them. The natives of warm regions suffer when they come into cold countries, as we see in individuals of the dark races when they have lived some time in England. In the same way the monkey tribes, all of whom belong to warm climates, are subject in England to tubercular disease of the viscera. In this country the character of the disease varies according to season, being worse in winter and spring, better in summer and autumn.

The next in order among the exciting causes is insufficient and unwholesome food, excess or irregularities in diet. These disturb the digestive organs, of which the mucous lining is easily disordered in such cases, and thus vitiate the nutrition of the body at its source. The injurious influence is aggravated by neglect of exercise, by sedentary and studious application for purposes of education, at an age when active exertion and sports in the open air would be more beneficial to mind and body. Thus disturbed digestive organs, pallid and dry skin indicating defective circulation in the capillaries, and flabby muscular flesh are generally found in these patients. Suckling children escape; they enjoy warmth, and have wholesome natural food.

When several exciting causes act together, and in a powerful degree, they produce a state of constitution not distinguishable from the naturally scrofulous. The crowded

dwellings of the poor, and their confined situations, their insufficient and unwholesome food, their deficient clothing, and want of domestic comforts, produce a state of the digestive, muscular, and cutaneous systems, not distinguishable from the scrofulous, and leading to similar morbid affections. This might be called acquired scrofula, as distinguished from that of hereditary origin. General exciting causes produce scrofulous forms of disease in those who have the predisposition. When that is strong, disease will appear without any assignable exciting cause.

Treatment.—As the numerous and various forms of scrofulous disease arise from a common cause, namely, natural imperfection of constitution, and as that original defect may be aggravated by mistaken and injudicious care, the treatment of those affected must be of general character, embracing their management in respect of diet, clothing, residence, exercise, and occupations. In comparison with these measures, medical treatment, though by no means unimportant, is of subordinate consequence. Medicines, however, and surgical aid will have a better chance of success when their effect is favoured by attention to the important points alluded to above.

The weakly appearance of scrofulous children, and the belief in debility as the cause of the mischief, has often led to the practice of ordering tonic medicines, such as bark and steel, and recommending the free use of animal food, with beer and wine. They who give such advice forget that individuals of naturally weak constitutions cannot do or bear what can be done or borne by those of stronger frame. The active circulation of healthy growing children is quickly disordered by stimulating food and drink; how then can we expect the weaker subjects of scrofula to bear such excitement? The strongest and healthiest child would soon be

in a fever if allowed animal food twice a day with beer and wine, to say nothing of the bark and steel.

The diet of the scrofulous should be easily digestible, nutritious, but not stimulating; a mixture of animal and vegetable nourishment has been found by universal experience best for the human species. There is no advantage in making it principally animal for scrofulous subjects, nor in excluding vegetables. The quantity and quality of the food should be such as will sit lightly on the stomach; sense of weight, uneasiness, or excitement of the circulation after eating are warnings that should be attended to. The dinner may consist of some light animal food with well cooked vegetables; occasionally beef tea or broth with vegetable and farinaceous additions may suit a weakened stomach better. Milk and egg with bread and other farinaceous articles, will supply what may be further required. When the circulation is languid and the skin pale, some well made malt liquor or wine and water may be given once or twice daily. The more excitable subjects will not bear liquid stimuli in any shape, and solid animal food sometimes disagrees with them. They do well with light animal broths, milk diet, including farinaceous matters, vegetables and ripe fruits. On the other hand, for the half starved, half clad, neglected and miserable children of the poorer classes, good diet and stimuli are the obviously necessary remedies, and combined with the cleanliness, warmth, and comfort of an hospital, soon call into action the restorative powers of the constitution.

For adult persons, three meals a day are amply sufficient. Some robust individuals in active occupation take only two, and enjoy excellent health. Younger, and especially growing persons, require to take food more frequently, perhaps four times in the day; nothing should then be taken in the intervals. There are some adults, who without being feeble re-

semble children in this respect, becoming weak, with a painful sense of sinking unless they take something to eat about once in four hours.

The condition of the skin is a matter of importance in the management of the scrofulous, in whom a dry, harsh, and pallid state of the surface, shows clearly that the cutaneous circulation is imperfect, and that its important office as an excretory organ must be either partially deficient or altogether wanting. Warm bathing is advantageous; where this cannot be procured, daily ablution of the entire surface with tepid water and soap will answer the purpose, the temperature being gradually reduced, especially as strength improves, and according to the season of the year; the ablutions to be followed by a thorough dry rubbing. When strength is improved so that the shock can be borne,the shower bath, either cold or with the water slightly warmed will be serviceable.

Warm clothing should be worn in such a state of skin, especially in the colder parts of the year. It is a very mischievous notion to suppose that the weakness which exists in scrofulous subjects can be remedied by hardening them, as it is termed; that is, by allowing them to be exposed to cold and vicissitudes of temperature, with insufficient clothing. The animal powers are comparatively defective, and should not be exposed to such trials. It is desirable that scrofulous subjects should have exercise; and that they should be allowed to go into the air, properly protected from cold. It is found, by experiments on animals, that the power of generating and preserving heat is less in young subjects than in adults; and less in proportion as the individual is younger.

According to the age and power of the young person, walking and riding may be resorted to, with the active sports and pursuits natural to childhood, with the benefit of exercising and strengthening the muscles. There will be suffi-

cient time both for amusing occupations and moderate studies. Sedentary employment of all kinds should be limited in amount, the improvement of health and strength being the primary object, while learning and accomplishments are of secondary importance in both sexes.

During the period of suckling, children are warmly clad, and kept much in contact with the mother, enjoying a supply of healthy nourishment produced by the hand of nature. Thus the two great exciting causes of scrofula under other circumstances, exposure to cold and insufficiency or unwholesomeness of nutriment, are prevented in the case of infants at the breast.

Change of air.—The greatest benefit is derived in cases of scrofula from residence in pure air, this alone, in many instances, being capable of doing more towards mending the state of the system than either external applications or internal remedies. It is vain, in many cases, to attempt relieving diseases of this kind while the patients remain in large towns, in crowded dwellings, in confined situations, and sedentary occupations. As soon as they escape and get into pure country air, the diseases which we had been attempting to remedy, but ineffectually, will get well of themselves.

Sea air, however, has no specific influence over scrofula. The disease may arise in those who were born and have always lived near the sea. Nevertheless, to persons living in large towns, the tonic and bracing effects of the sea air produce so great and beneficial an alteration that the worst forms of scrofulous disease often get well rapidly, simply by this influence.

An infirmary is established at Margate for the reception of scrofulous patients during a part of the year, and the general practice is simply to cover the affected parts with cloths dipped in the salt water, trusting in other respects to the effects of the sea breezes.

I have been surprised at finding even medical persons sometimes questioning the advantages derivable from change of air, either in scrofula or in other diseases. It is stated in explanation of this doubt that the air, when analysed chemically, presents the same elements in all the varieties of situation, for instance in the heart of London or on Salisbury Plain. This will be readily admitted, but there may be something besides the mere proportion of gases capable of acting favorably or unfavorably on human health.

Some years ago, I had an opportunity of seeing, in a family I was well acquainted with, the marked effects produced by change of air. The family consisted of a gentleman and his wife, both of whom were persons of middle age, and about nine or ten children, who had lived for many years in the neighbourhood of London, but not in town, both themselves and their offspring enjoying invariably good health. There were appearances about the children which might have led to the suspicion of scrofulous diathesis, yet they had suffered no form of scrofulous disease, and though the family consisted altogether of eleven individuals, they had contributed very little to the support of our profession. The eldest son had slight enlargement of the glands of the neck, and when he got older he contracted the venereal disease, and had bubo, which was very troublesome. Circumstances connected with the professional pursuits of the father induced him to leave his original abode, and to bring his family into a close and confined part of London. Within two years a marked change had taken place in their health. In the first place a child died at the age of about three years; it had been previously healthy, but became ill soon after the father removed. It had scrofulous ophthalmia, and swelling of the lower eyelid, with formation of abscess. There was undefined indisposition, that sometimes affected the head, sometimes the chest, and some-

times the abdomen, and at last it died from a severe attack in the chest. On examining the body I found extensive ulceration of the intestinal mucous membrane, and considerable enlargement of the mesenteric glands, with tubercular disease of the lungs. Another infant died at the age of six months. The eldest daughter of the family, a remarkably fine, beautiful young woman, at the age of seventeen, began soon after the family had removed to town to have uneasy sensations in the chest, then an attack of inflammation took place, and this ended in consumption, of which she died. The father, a person who had enjoyed good health, and who lived regularly, had a severe attack of inflammatory character, in the bowels. All this took place within two years, while, in the whole preceding period of their residence in the neighbourhood of London, during which they had nine children, nothing of the kind had taken place. This impressive warning induced the parents to leave London, and no further mischief occurred.

When the diet, the state of the skin, the clothing, exercise, residence, bodily and mental occupation of the scrofulous, more particularly of those under puberty, have been properly regulated, much will not be required in the way of medical treatment strictly so called. The state of the digestive organs, and that of the general strength, as shown by the condition of the circulation and the amount of muscular power, will be the two points requiring attention.

Under neglect, or injudicious treatment, particularly when full and strong diet with stimuli has been allowed, on the notion of remedying weakness, the stomach may be disturbed and the bowels loaded with undigested food and unhealthy secretions; there is costiveness, with foul tongue and offensive breath, perhaps a tumid state of the abdomen. The alimentary canal must be cleared by an active aperient, such as

calomel with rhubarb, jalap, or scammony, the dose being moderate, and repeated if necessary. The Hydrarg. c. creta, with rhubarb or jalap, may be sufficient, or castor oil, if the stomach will bear it. After the bowels have been cleared and relieved, it may be necessary, not to purge, which would be injurious, but to assist them in their office by occasional mild means, such as a small dose of gray powder with rhubarb, of castor oil, of the concentrated infusion of senna as combined with other matters, so as to remove its unpleasant taste, of Epsom salt with dilute sulphuric acid. The compound decoction of aloes is often serviceable, given in the middle of the day, or a little before dinner. If the bowels should be disposed to act naturally, it will be best not to interfere with them.

The languid circulation, pale skin, cold extremities, and deficient muscular power of the scrofulous, especially in those most unfavorably circumstanced, clearly indicate the necessity of tonics, bark and steel in their various forms being the most appropriate medicines of this class. The liquor cinchonæ of Battley, and quinine are the most eligible forms of the former; steel wine, ammoniated tincture of iron, and the tincture of the sesquichloride of the latter; while the citrate of quinine and iron presents a combination of both remedies. The iodide of iron is another combination easily taken by children in the form of syrup: its action seems to me to be simply that of iron. Some scrofulous subjects, however, will not bear tonics in any shape or dose; these are principally the excitable children, with whom stimuli and full animal diet disagree. If the bowels are unloaded, and the tongue clean, they may be safely tried.

The principles of medical practice in scrofula are not very clearly established, as some think well of the mineral acids, nitric, muriatic, or sulphuric, with light tonics, such as cascarilla, while others repose much confidence in liquor potassæ

given rather freely, or in the sesquicarbonate of ammonia usually combined with vegetable infusions. The former may be taken in infusion of orange peel or sound beer.

The iodide of potassium has been strongly recommended in the treatment of scrofulous complaints, for which a French physician, M. Lugol, has regarded it almost in the light of a specific. He employed it in solution, with the addition of iodine (Potassii iodidi gr. x; Iodinæ gr. v, Aquæ destill. Oj), giving five to ten minims three times daily, and gradually increasing the dose. To so trifling a dose as this we cannot ascribe any efficacy. The iodide may be given in doses of one to three grains, in any suitable vehicle, two or three times daily. I cannot say that I have seen any benefit derived in scrofula from this remedy, powerful as it is in many other diseases. Cod-liver oil has been and still is extensively used in scrofula and other diseases, with a firm belief in its efficacy, whether it be regarded as food or physic. Increased activity of nutrition is often evidenced under its employment in children by increase in bulk and weight. The liver oil of other fishes, of the rays particularly, and purified sperm oil, have been found equally beneficial, and there is a doubt whether olive or almond oil would not do as much good. Cream, while more agreeable, would probably be no less beneficial. The purest kind of the cod-liver oil should be given as being the least repulsive in taste. It is sometimes so offensive to the stomach that it cannot be continued. Children may begin with a teaspoonful three times a day, and gradually increase the quantity.

Sarsaparilla is a mild tonic and restorative, useful in dilapidated and weakened states of constitution. A child might take a teaspoonful of the fluid extract three times a day, with or without quinine.

The administration of mercury is properly discouraged in scrofulous cases, in which, however, its sparing use is not

unfrequently necessary. Thus calomel in small quantity is combined with other aperients to unload the bowels, and the gray powder may be used with rhubarb as a mild aperient, when the secretions are unhealthy. Sometimes a more active and continued use of this mercurial may be advisable to check the progress of disorganization, and it might be sometimes necessary for this purpose to go on with it so as to affect the system, the constitution being well supported at the same time. A safe and convenient mode of exhibiting mercury in small doses in some scrofulous cases is afforded by the bichloride, of which a grain may be dissolved in two ounces of tincture of bark or rhubarb, one drachm to be taken twice daily.

Local Treatment.—Inflamed absorbent glands proceeding to suppuration, or subcutaneous abscesses, are best treated by poulticing. In order to avoid unsightly cicatrices on the face or neck, especially in females, it is desirable to prevent inflammation and thinning of the skin. The matter should be evacuated by a careful lancet puncture before the skin is changed in colour, and poultice should be continued.

In languid and tedious ulceration, whether consequent on suppuration or otherwise, resin ointment, and the solution of sulphate of zinc, or nitrate of silver, will be useful. Lint or rag dipped in sea water, or simple ointment, will be sufficient when things are going on favorably. In simple enlargement without active inflammation, the part may be covered with soap plaster as an external defence. In chronic inflammation of an important part, such as the testicle, the use of mercurial ointment or plaster may be necessary. The tincture of iodine, or the iodide ointment, will be available in chronic scrofulous enlargements generally. The principle of counter-irritation by blistering, or preferably by the emetic tartar ointment, is often useful.

CHAPTER XVI.

GOUT AND RHEUMATISM.

Although gout and rheumatism are rather medical than surgical subjects, the morbid states designated by these terms are chiefly known by producing local disease; thus as surgeons often have to treat cases called gouty or rheumatic, we cannot entirely omit the subject.

We naturally inquire what is the real nature of the disease in the cases called gouty and rheumatic? Whether the inflammation of the joints, particularly of the fibrous and synovial membranes of the joints, in cases called gouty and rheumatic, is essentially different from common inflammation? Whether the treatment be the same in the two cases? Whether persons of gouty or rheumatic constitutions are liable to the consequences of that peculiar inflammation in other parts of the body as well as in the joints? The subject, perhaps, will be best elucidated if we consider the affections of some part which is liable to the different varieties of inflammation.

The knee may be the seat of common inflammation, or of the affections denominated gouty or rheumatic. Under all three of these circumstances the motions of the part are impaired; it is more or less painful; and it is usually in some degree red and heated. There may be a difference in the degree of these symptoms, but such differences are

only in modification, or form, and not in essential nature. Indeed, if we look to the local symptoms only, we shall not always be able to establish the diagnosis. Although, however, the three cases agree in this general view, they differ in their causes, progress, termination and treatment.

Common inflammation is caused by mechanical injury, which produces its effects under all circumstances, and on all individuals whatever may be their age or other conditions.

Rheumatism is produced by the action of cold, or various external influences immediately on the joint itself, or some other part of the body, but they do not produce the affection in all individuals. Several persons may be exposed to cold, or other external influences, but it will produce rheumatic affection of the joints only in some proportion of them. For the production of rheumatism, therefore, you require some external cause; and, at the same time, a particular constitution, having a disposition to the complaint. Gout may be brought on by injury or by external influences, but it most commonly appears spontaneously: indeed it may come on in a joint, and it frequently does so in the middle of the night, when the patient is quiet in bed; so that here we look simply, in explaining the phenomena, to an unhealthy state of constitution in the individual. Here the local affection is the external manifestation of some internal or more general affection.

So far, then, as the cause is concerned, there is an obvious distinction between the three cases. *Common* inflammation is the result of local agency; *rheumatic* inflammation requires some external influence, combined with a predisposition of constitution; and *gouty* inflammation results from a morbid state of constitution, without external cause.

In common inflammation there is a regular progress of the affection, which goes on uninterruptedly. The symptoms,

at first slight, become more considerable, and the disease gradually increases to its full development. It remains for some time in full activity, then gradually declines, goes off, and leaves the patient without liability to future attacks.

In rheumatic inflammation, on the contrary, the affection appears suddenly in a decided form. The joint is swelled, painful, and becomes at once inflamed. Soon after it has appeared in one joint, it may show itself in another. It may suddenly cease in the part first affected, and appear elsewhere. It may return to the first part. The patient will be liable to future attacks. But the sudden development of the disease, its sudden and abrupt cessation, its extension to other joints, its affecting several of them at the same time, and its influence in exciting pericarditis, particularly characterise rheumatic inflammation.

In gouty inflammation, the disease, as in the rheumatic, exhibits its full character at the first onset. The commencement of the attack is characterised by pain in the part, increasing to a severe degree, and then gradually declining. There are paroxysms of acute pain in its severest forms; these, after a time, diminish in intensity, and then disappear. Here, as in rheumatism, the complaint often abruptly ceases in one part, and extends to others, while those first affected may suffer again. Thus gouty inflammation is irregular in its course; it shifts to other joints, and there is great probability, almost amounting to a certainty, of future seizures. After repeated attacks of gouty and rheumatic inflammation, the joints pass into a condition of chronic enlargement, with stiffness, and even complete loss of motion, with depositions of lithic acid compounds in the case of gout. In the case, then, of common inflammation, we have only to consider the development of disease in the part, consequent on a local cause. But in rheumatic or gouty cases there is the local inflam-

mation, and something superadded to it, and the great object of inquiry is to find out the nature of the additional circumstance. We find that a person who has for the first time a gouty attack, is almost invariably in a plethoric state, produced by excessive nutrition, the result of luxurious habits and indolence. Gouty inflammation is most frequent in individuals of sanguine temperament, and in those of robust frame. Generally speaking, it is most common in the higher classes, in those whose situation in life gives them habits and the means of indulgence and indolence.

In the first attack of gout the patient generally has a full, strong pulse, heat of skin, white tongue, and disorder of the digestive organs. The disorder last mentioned is not to be regarded simply as the cause of the mischief. Like the gouty attack itself, it is an effect of those habits which lead to a plethoric state of constitution. The alimentary apparatus has probably been strong and efficient, capable of assimilating the abundant nourishment introduced into the system. If the stomach be feeble and easily disordered, the state of plethora cannot be established. The originally vigorous organs being no longer equal to the tasks imposed on them, fail in their office, causing imperfection and disorder in important functions, which precede the outbreak of the gouty attack. The latter gives general relief, effectually and quickly, in the early stages of the complaint.

Such is the condition of a patient when he first becomes the subject of gouty attacks; but when these have been repeated, when a person has suffered for a series of years from successive attacks of gout, his state is quite different from that now described; there is deficiency in the various excretions, and a degree of languor in the system, in which there is hardly power to form gouty paroxysms.

There is little difficulty in pointing out the proper mode of

treating such an affection. The disease in the part is by no means the most important circumstance, it is rather of secondary consequence. Generally speaking, we may almost neglect the consideration of the local affection, which may be regarded as a sort of safety valve to the constitution, carrying off without danger a diseased condition, which might otherwise lead to more important consequences. Warmth, therefore, and rest, are the principal points in treating the local affection, if it remain within moderate limits; but if it goes further, we may employ leeches to the part, with fomentations, and so forth. But our attention should be principally directed to remedy the state of plethora from which the local symptoms are derived, on which point observations have been already made in reference to the unhealthy states of constitution which give rise to spontaneous diseases. In addition to the course of treatment there described, benefit may often be derived from the use of colchicum, of which the wine of the seeds, and the acetous extract, are the most useful forms. It is so useful in the treatment of gouty inflammation, that some persons regard it almost in the light of a specific for the complaint.

Such are the means by which the condition of the system which gives origin to the gout in the part, may be removed. The more important consideration is, what can be done to prevent the recurrence of such attacks? If the habits of living which, in the first instance, have produced a state of plethora, be continued, there can be no doubt that the individual will be the subject of future attacks; that these will become more and more severe, extending to a greater number of parts, and ultimately reducing the patient to a state of miserable suffering. Now there are two modes which persons may take to accomplish this object, and unless they adopt these courses they will not succeed. The two means are

temperance and *exercise.* Persons must be contented to work hard, and to live moderately; they must, to use a homely phrase, "keep their eyes open, and their mouths shut." Mankind like to indulge their appetite, to lead indolent lives, and yet they wish also to have health. They want to combine two things that are incompatible, but they ought to be reasonable; they may have good eating and drinking with bad health, or good health with temperate fare.

Our notion of gout is not to be confined to its effects on the joints; other organs and textures are liable to disorders, which originating in the same cause as the affections of the joints, are not improperly termed gout both in popular and medical language. The head, chest, or abdomen, may suffer in this way. Are these affections peculiar, that is, gouty, or of common character? There is no peculiarity in treatment, nor in the result of examinations after death, that we should call gouty. When disease in gouty individuals occurs in internal parts, it has the same symptoms which would characterise common inflammation in the same parts. There are no external signs by which we can distinguish a gouty attack in the head, chest, or abdomen, from other diseases in the same situations; and examinations after death do not enable us to distinguish such disorder from inflammation induced by other causes.

The iris affords an example in a part comparatively external, of the peculiar character of inflammation in a gouty person. It is very liable to disease in persons of such constitution, and the inflammation exhibits some characters which enable us to distinguish it from other inflammatory affections of the part. The iris, like the joints, may be the seat of repeated attacks of inflammation in the gouty, which, although serious at the time, as in the joints, pass off without much injury to the organ: their frequent repetition, however,

ultimately inflicts such damage on the delicate texture, as seriously to impair or even to destroy sight. I have, however, seen the iris disorganized, with loss of sight, by a single attack in a gentleman of full habit, under thirty years, being the first manifestation of gout which he had experienced. Such an attack would not only justify, but absolutely require the most energetic employment of bleeding and mercurialization.

I was consulted by a gentleman, forty years of age, a stout person, of sanguine temperament, fair complexion, with rather light eyes. He had lived a luxurious and dissipated life at Oxford, drinking freely of port wine. At the age of twenty-two he had a severe and painful affection of the joints and other parts, which lasted several months. This induced him to leave off port wine; but he had always enjoyed an excellent appetite, and had been in the habit of drinking beer freely. He had experienced ten attacks of inflammation of the right eye, and the left had suffered on two occasions; on one occasion the inflammation occupied three years, and at that time he had some swelling in the right hand: with this exception, he had not suffered in the joints or limbs since his first illness. In the right eye, the iris was so changed that you could hardly recognise the natural texture of the part, and vision was nearly extinct.

I performed an operation for cataract on a gentleman who had lost the sight of one eye entirely, from repeated attacks of arthritic disease, while the other had suffered from the same affection. He was fifty-five years of age, of fair complexion and sanguine temperament, and he had passed several years in the West Indies, living freely, and indulging in spirits. He had suffered greatly from gout in the joints of both hands, which were swelled and knotted in a remarkable manner. These deformities, showing a most unhealthy con-

dition of the digestive organs and nutritive function, are produced by the deposition in and around the joints and tendinous sheaths of urate of soda, a whitish friable substance with a loose resemblance to chalk, and hence popularly called chalk stone. The pupil of the lost eye was nearly closed, and the capsule of the lens was opaque. Being unwilling to operate on account of the disposition to gout, I recommended him to use belladonna, which he did, and I at last operated by his wish rather than my own desire. I feared that the operation would bring on gout again. He lived low for some weeks, taking Plummer's pill and purgatives. At the time of the operation I opened the capsule, and broke down the lens in its situation; fortunately no inflammation followed, yet the state of the pulse made me bleed him more than once after the operation. In about two months the operation was completed, and he had perfect vision. I remember his mentioning to me, when asking him about the state of his fingers, that of late years, though he had suffered from gout, he had got a perfect remedy, and I found that to be colchicum. Whenever he had any warning symptoms, he took a few doses of this medicine, which effectually prevented the attack.

Rheumatism is a disease closely allied to gout, and, like it, principally affects the joints. As in the case of other affections nearly resembling each other, these run together, so that we sometimes hesitate in determining which name should be given in particular cases. The term rheumatic gout, familiarly employed in common language, and not altogether disowned by medical men, serves to solve the difficulty. As we cannot show how persons subject to gout or rheumatism differ when the diseases are absent, from those naturally healthy, so we are unable to distinguish between the two constitutions except from the characters of the affections to

which they give rise. There is one striking difference between the two disorders. In gout, the local affection almost invariably appears spontaneously, as the simple result of the constitutional disposition, while in rheumatism it is more commonly caused by external agencies, such as cold and moisture, or unusual exertion. In spontaneous cases, the swelling of the joints, as in gout, is preceded by disorder of the digestive organs and fever. If blood is taken in the state of general disturbance preceding the rheumatic attack, or at an early period of the disease, it exhibits the inflammatory character. In rheumatism the synovial membrane is the seat of disease, the external coverings being often unchanged, and the pain frequently slight, while in gout the external parts are greatly swollen and red, with excruciating pain, but no evidence of effusion into the articular cavity. There is less tendency to affections of internal organs in rheumatism than in gout, with the important exception of the heart and pericardium, both pericarditis and endocarditis being frequently induced, especially in young subjects. The eyes suffer in both cases. In gout the affection commences in, and is confined to the iris, while rheumatic ophthalmia begins in the sclerotica and extends to the cornea and iris. The latter affection yields to ordinary remedies, especially in the outset. Should these have failed, and the complaint have been tedious, great and sudden benefit is often experienced from powder of bark and carbonate of soda in five or six grain doses three or four times daily.

The treatment of rheumatism in the early period will consist, like that of gout, in removing the unhealthy state of system on which the local affections depend. The moderate loss of blood may be advantageous in some cases, especially if we see grounds for fear that the pericardium or heart may become affected, though local bleeding by leeches is generally

preferred to venesection. Aperient medicines, salines with nitre and colchicum, and mild mercurials, with light diet and perfect rest, will be proper. Swelled and painful joints may be covered with cotton wool. If a joint, such as the knee or wrist, should be actively inflamed, with such pain as to interfere with rest, local depletion will be advisable to prevent increased constitutional excitement, as well as to protect the joint from such changes of structure as might impair its mobility.

CHAPTER XVII.

SYPHILIS.

Syphilis and *venereal disease* are expressions used indifferently to denote a train of morbid appearances originating from infection directly conveyed from a diseased to a healthy individual, seldom in any other manner than by sexual intercourse. Venereal disease is the more general term, embracing, according to its etymology, the affections proceeding from sexual intercourse. Adopting the expression in its more general sense we divide venereal diseases into syphilis and gonorrhœa.

In *syphilis* we distinguish two classes of morbid affection, the *primary* and *secondary*, which may also be called the local and constitutional forms of the disease.

The primary effects are seen in the parts to which the poison is immediately applied, that is, in the organs of generation, or in their near neighbourhood. They consist of inflammation with swelling proceeding quickly to ulceration. With these affections disease of the inguinal or femoral absorbent glands is sometimes combined, not however immediately, nor even quickly. Such glandular affection therefore is not strictly primary. Still the primary sore under the name of *chancre*, and the glandular disease under that of *bubo*, which is the Latinised form of the Greek word for the groin, are called the primary or local symptoms of syphilis. The

former expression is equivalent to primary venereal sore, and there can be no objection to it if employed to include the whole of them. Primary sores, however, differ in character, and the word chancre is often used to denote one of these, and that not the most frequent, the others being considered different in their nature, and therefore not chancres, to the great confusion and discomfort of students and persons of limited experience. I do not use the word chancre in the limited sense alluded to above, but more generally as equivalent to primary sore.

The *secondary* or *constitutional* symptoms are various affections of the skin, eruptive and ulcerative; of the throat, tongue, and mouth; of the osseous system, namely, of the periosteum, bones, and joints; of the eye, nose, ear, testicle, larynx.

These constitutional symptoms are properly *syphilis* or *lues venerea*, or in vulgar English, pox. This, although hardly admissible in polite language, is an innocent word, the plural of the Anglo-Saxon poc, meaning pustule, and employed in that sense in cowpox, smallpox, &c. Syphilis, then, to use the language of grammarians is a noun of multitude. It is not a single affection of one part, but the word is used, like scrofula, to denote various diseases of several organs and textures, which proceed from one common source.

The production of secondary symptoms is not essential to the notion of syphilis. Primary are not constantly followed by secondary symptoms. The latter occur only in a proportion of cases; which proportion has been variously stated from one third to one twentieth, or even one fiftieth. The proportion may perhaps be influenced by treatment.

History.—The venereal disease is supposed to have been unknown to the ancients; if so, they were happy in their ignorance. We find, indeed, in ancient writers, such as Celsus, and in the works of other authors, scattered passages respecting affections of the generative organs, which might be supposed

to have been of venereal origin; but no delineation of the subject even approaching to our present knowledge, and no account of the secondary symptoms.

It is first clearly described towards the end of the fifteenth century by the writers of Italy and France, who speak of it as a new, loathsome, and obstinate disease of very destructive and even often fatal nature, propagated by sexual intercourse and in other ways. Two remarkable events took place about this time: the discovery of the new world, as it was then called, by Columbus, who returned from his first voyage, in which he had discovered the large island called by the natives Hayti, which he christened Hispaniola, and which has since commonly borne the name of St. Domingo, in 1493; and the invasion and conquest of Naples by Charles VIII of France, who having entered the city in February, 1495, was soon obliged to retreat.

The origin of syphilis has very commonly been referred to one or the other of these events. Some have considered it to have been a new disease brought from St. Domingo by the crew of Columbus; others, that it broke out in the army of Charles VIII, which was a great assemblage of troops and military adventurers from all quarters, when it was disbanded on his retreat from Naples, and indulging in the license and violence of the times, extensively propagated the affection over Italy, France, and the south of Europe.

I can find, not only no sufficient evidence, but no evidence at all of the American origin; none that the disease existed originally in the West India islands, or in America; none that the followers of Columbus brought back with them any particular disease old or new.

The names under which the disease was known, when it first attracted attention, afford clear negative evidence respecting its American origin. The Italians call it *mal Fran-*

cese, French disease, while it is termed *morbus Gallicus* in a collection of writers on the subject. The French return the compliment by calling it *mal de Naples* or *morbus Neapolitanus.* It has never been called Spanish, American, West Indian, or Haytian.

On examining the historical evidence upon this subject we find unequivocal traces that the venereal disease existed in Europe before the discovery of Hayti by Columbus. There are passages in the writings of authors who lived eight or ten years before that time, which show that the venereal disease was then not unknown. Peter Martyr, who was then physician to the king of Spain, speaks of the disease under the name of *morbus Gallicus,* thus affording unequivocal proof that it was known at that time.

If we reject the hypothesis of the West Indian origin, we may next inquire whether there is any clear proof that syphilis, now so universal, originating in and kept up by causes which have been and still are in constant action all over the world, was first seen in France or Italy in the wars connected with and following the invasion of Naples by Charles VIII, and that from this source it was disseminated through Europe by the military of various countries connected with those wars. This view could not be adopted except on the clearest and strongest evidence, and such proof is totally wanting. Medical science, cultivated in some points by the ancients, had been long and totally neglected. Priests and monks had some rude and imperfect notions of medicine, while surgery, if it might be so called, was exercised by barbers, attendants on baths, and others equally ignorant. Under such circumstances, the venereal disease, like other complaints, had been neither observed, appreciated or understood, so that its description by well educated and informed persons who began to study the subject properly, seemed like the

account of an entirely new matter. It was merely a description and explanation of what had previously failed to excite observation and reflection; and it attracted the greater attention as the statements were all of the most exaggerated and alarming description.

Assuming that identity of effect implies identity of cause, I cannot doubt that venereal disease is as old as the promiscuous intercourse of the sexes on which it is now invariably attendant. It may be regarded as a punishment falling appropriately on those who disregard what has been called the obvious design and intention that the sexes should cohabit in single pairs, an arrangement so consonant to the entire physical and moral nature of our species as to be equally important to the individual and the community. Liability to venereal disease is a considerable though too often insufficient sanction for the observance of this law. The want of this restraint, imperfect as it is, would be a great encouragement to licentiousness, vice, and immorality.

Not only was the occurrence of sores on the genitals of both sexes, and that of buboes well known before the time of Columbus and Charles VIII, but the liability to infection was well understood, as is proved by measures of precaution resorted to in this country and elsewhere. Public brothels existed in those days in many cities on the continent, and were subjected to regulations intended to protect the health of their visitors. One was established in Rome, near the palace of the Pope, yielding a tribute to the marshal of the court of Rome. There was one in Southwark, under the jurisdiction and care of the Bishop of Winchester, with the regulations of which, although said to be still extant, I am not acquainted. There is however, in Astruc's great work on the venereal disease, a detailed account of a brothel at Avignon, established by Johanna the First, Queen of the two Sicilies, and Countess

of Provence, with the rules for its management in the original Provence dialect, and in a Latin translation. She directs that the establishment shall be placed near the convent of the Augustine friars, a situation that might have been convenient to the inmates of both houses, and that all the girls shall wear a red shoulder-knot. The most important regulation is the fourth, by which it is ordered that on every Saturday a barber, deputed by the consuls, should examine all the girls, and that any one who should be found to have contracted any illness by her fornication (scortatione agritudinem ullam contraxisse) should be separated from the rest and not allowed to follow her calling, ut morbi præcaveantur, qui a juvenibus possent concipi. The date of this ordinance is 1347.

They who believe that the venereal disease did not exist in the world till the very end of the fourteenth or the beginning of the fifteenth century, and that it then broke out all at once in a mysterious and inexplicable manner somewhere or other in the south of Europe, allege the silence of preceding writers as a conclusive argument in favour of their opinion. It is true that the venereal disease is not described by name before that period. Syphilis and lues venerea were words not heard of before the sixteenth century. The great variety of affections embraced under our present notion of syphilis, and the relations they bear to each other, constitute an important subject entirely beyond the comprehension of the barbers and ignorant men to whom the care of external complaints was turned over in the middle ages; the natural history of the complaint is as yet but imperfectly understood. A long period must have elapsed before constitutional symptoms occurring weeks and months after the primary affection could have been understood as consequences of the latter, and before the train of subsequent affections sometimes prolonged for years could have been appreciated. In respect

to this argument drawn from the silence of preceding writers, let us remember that it has been doubted whether the contagious eruptive fevers were known to the Greek and Roman physicians. The Arabians pointed out their existence clearly, but their distinctive characters, though apparently obvious to common observation, were for a long time neither perceived nor acknowledged. Smallpox, measles, and scarlet fever were considered as mere varieties of the same disease, till near the beginning of the eighteenth century; and the diagnosis of measles and scarlet fever was not established till 1793, in the second edition of Dr. Withering's essay on the latter. The smallpox was known for centuries before its contagious nature was recognised, and even Sydenham ascribed it to the state of the atmosphere, with only a vague and doubtful reference to contagion. These considerations show us that the truth may escape the notice even of enlightened observers, and lead to the conclusion that the diseases of mankind, like their moral and physical constitution, are likely to remain unchanged.

Against hastily concluding that diseases not previously described have therefore not existed, we may derive a salutary caution from the cases of gonorrhœal ophthalmia, and syphilitic iritis. We cannot doubt that both of these very striking affections now so commonly met with, must have been frequently seen at all times, though they have entirely escaped the notice of Mr. Hunter, and of the other writers on syphilis, until within a few years.

In our ordinary experience, syphilis appears as the effect of a poison directly communicated from an infected to a healthy person. The infection cannot be conveyed, as was supposed heretofore, by kissing, embracing, use of the same cups, or other utensils. In the great majority of instances a morbific secretion, that of a primary ulcer or chancre, applied to the sound surface of a healthy person, produces the pri-

mary symptom, an inflammation proceeding generally to ulceration.

The *secondary* symptoms come from this source; we do not know how, any more than we know how the constitutional excitement called hydrophobia is caused by the bite of a rabid dog, or that of smallpox by inoculation, or atmospheric contagion. A poison is said to be introduced into or to be expelled from the constitution; the system is said to be contaminated. These somewhat figurative expressions do not denote anything capable of demonstration. There is reason to suppose that the blood is altered, but the alteration is not recognisable by our present means of examination.

The matter secreted by primary sores is obviously infectious; it is even infectious to the same individual by inoculation. The matter of bubo is infectious. Surgeons have contracted primary sores by wounding themselves in opening buboes, or by application of the matter to existing wounds. Destruction of the eye took place in two instances by inflammation excited by the matter of bubo spirting into the eye of surgeons who had opened the suppurations. It is said that the secretion of secondary sores will not infect, and that it produces no effect when inoculated. I should not like to trust it in my own person.

Syphilis may be communicated indirectly, thus when a pregnant woman labours under the disease in its constitutional form, the child *in utero* becomes diseased, generally, though not invariably. Here we must conclude that the poison is conveyed by the blood. Again, diseased infants infect healthy women by suckling, and the disease thus communicated may affect the embryo in case pregnancy should supervene.

It is a question whether a woman can be infected by cohabitation with a man labouring under constitutional symptoms. The appearance of syphilis in married females is a

very unpleasant, indeed a painful occurrence. It is difficult to get clear evidence on the point, the motives for misrepresentation and concealment being strong. I have seen cases, in which I believed that syphilitic disease occurred in married women from cohabitation with husbands labouring under secondary symptoms; and I see no reason why the infection may not be conveyed through the seminal secretion of a diseased male as well as through the blood of a diseased pregnant woman.

We speak and write familiarly about the venereal virus or poison as if it were something well known to us, but we are not acquainted with its real nature, knowing it only by its effects. Thus I could only describe it as that state of secretion from a sore which is capable of producing a sore in another person; that it is the state of the mother's blood which renders it capable of infecting the offspring; but what these particular states are, we are unable to determine, that is, we have no sensible or chemical signs by which the matter of a sore, or the blood of a pregnant woman under such circumstances, differs from ordinary matter or from ordinary blood. When, therefore, we read of the venereal virus "entering" or being "expelled" from the constitution, or of the constitution being "impregnated" with it, or of its "lurking" in the system, these are vague expressions, which have no precise meaning.

The next point of inquiry is, whether there be one kind of poison only, or more than one? Inasmuch as the real nature of the poison, that is, the real source of the symptoms, is unknown, this question resolves itself into another: whether the various symptoms that we recognise as syphilitic are so different from each other, and so regular in those differences, as to induce us to refer them to different sources? We must acknowledge, on a superficial view, that there is considerable variety in those symptoms, to which we give collectively the name of syphilis, or venereal disease, that there is such

diversity, whether we regard the primary or the secondary symptoms. The primary symptom may be a simple abrasion, an excoriation, an ulcer with induration, a phagedænic or a sloughing sore. Syphilis may consist either of an ulcer alone or with a bubo, or of those primary symptoms followed by scaly, papular, tubercular, or pustular eruption, by ulcerations of the skin, by superficial or excavated ulcer of the tonsils, or by affections of the bones, the periosteum, or the joints. In this variety of effects, which may last only a few days or weeks, or extend to months or years, syphilis presents a strong contrast to the results of other animal poisons, such as smallpox, measles, scarlatina, which, without being absolutely uniform, present a general regularity of symptoms, progress, and duration.

Heretofore all the appearances called syphilitic were referred to one source, they were considered as the various effects of one poison. In more modern times, and more particularly by Mr. Hunter, a distinction was attempted to be drawn from the effects of mercury. When the disease got well without the administration of mercury, it was considered not to be syphilitic; and those diseases arising from sexual intercourse, which got well under the use of mercury, were considered to be syphilitic. Mr. Carmichael, of Dublin, who was surgeon to the Richmond Hospital in that city, where a large number of syphilitic patients are admitted, wrote an 'Essay on the Venereal Disease,' containing the result of his observations, and giving useful practical rules for the treatment of such affections. In this work he has advocated the opinion of a plurality of poisons. He has attempted to show that each particular primary ulcer is attended with its peculiar set of secondary symptoms. He has, therefore, connected together the primary ulcers with the secondary symptoms, which he considers particularly to belong to them; and he has thus established, in his own opinion, the existence of four

distinct kinds of affection, which he has named after the character of the eruption, and considers as the result of so many different poisons. I am aware that many of the distinctions which Mr. Carmichael has pointed out are founded in observation, and you will recognise the justice of many of his remarks; but I cannot say that the combinations of symptoms which he has pointed out are so constant as to lead me to adopt the same conclusion that he has arrived at.

Hitherto we possess little or no information respecting the very first point which offers itself for our investigation on the question of the unity or plurality of poisons; that is, whether each particular primary sore propagates its like or not. We have no means of settling the point by direct experiment; we cannot inoculate this complaint, as we do the smallpox. It rarely happens that we have the opportunity of comparing the disease in the person infected with that in the quarter from which the infection proceeded. There has been a want of correspondence in the small number of cases in which I have been able to make the comparison.

I had a married woman under my care in the hospital with a phagedænic sore on the nympha, which nearly destroyed the part. She had contracted this from her husband, who was attending as an out-patient at the same time. He had ulceration of the glans and prepuce, without the slightest approach to the phagedænic character. Mr. Evans, a surgeon in the army, who has published an instructive pamphlet on ulcerations of the genitals, witnessed the examination of the women of the town in some of the French cities. Many of them had discharge from the vagina, with consequent excoriation, hardly any had ulcerations. Yet the English soldiers, who had intercourse with these women, were affected with ulcerations in numerous instances, such as are deemed syphilitic. Both in army practice and in civil life, instances have sometimes

been known of different men having intercourse in succession with one and the same woman. Within a short time one has had gonorrhœa, another ulcerations, and a third has escaped. Here, however, the evidence is incomplete, as we do not know the exact state of the women.

As we are quite in the dark respecting the actual venereal poison generally, as well as on the question whether there is one poison only or more than one, we are naturally led to inquire whether the great variety in the affections comprehended under the general name of syphilis may not depend on differences in those who receive the infection, particularly in constitution and state of health, perhaps also in the management and treatment local and general; the character of the symptoms is less favorable, the disease is more intractable and enduring in the scrofulous than in those of healthy constitution. In a person of full habit, continuing course of intemperance and other irregularities, all the sufferings are aggravated, and dangers are incurred which the prudent entirely escape. The effect of constitution and mode of life is strikingly illustrated by Dr. Ferguson in his "Observations on the Venereal Disease in Portugal," published in the fourth volume of the 'Medical and Chirurgical Transactions.' He says that the venereal disease in Portugal is extremely mild; that the natives of that country are in the habit of treating it by vegetable decoctions and low diet; that they suffer little from it; that it seldom produces serious symptoms; that when it goes into a constitutional form, it wears itself out under this treatment, not interfering materially with the health. Thus he considers that the disease, among the Portuguese, has lost its virulent character; but he says that the British troops and officers had the disease in that country with the utmost severity; that a greater number of instances of loss of the penis occurred among them, in a short time,

than he supposed could be presented by all the hospitals of this country for a number of years. Yet the disease had arisen from the infection of the mild disease that I have just mentioned. The secondary symptoms were of the most severe kind, and extremely intractable.

Dr. Ferguson, who was inspector of hospitals in the British service in Portugal, had occasion to see an officer labouring under chancres, with a highly-inflamed state of the parts, proceeding to sloughing, in consequence of sexual intercourse four days before, and he had been guilty of no excess or irregularity to produce this bad state of the sores. Dr. Ferguson, with great difficulty, by active treatment, prevented mortification of the penis. The woman who communicated the infection was an opera dancer in Lisbon, apparently in perfect health, who continued upon the stage for many months afterwards, occasionally infecting others, without anything extraordinary in the nature of the symptoms.

Nature of syphilis.—The affections included under the general name of syphilis are too various to admit of being described under any one character. The processes are the same as in other diseases, differing only in modifications: they are inflammation, ulceration, mortification, suppuration, enlargement by interstitial deposition. Inflammation is seen in all its degrees, from acute to chronic. The same may be said of ulceration, which is sometimes rapidly destructive and very painful, at others slow and indolent. Constitutional disturbance occurs in various forms, both inflammatory and of hectic character.

Respecting the nature and progress of syphilis, and our power to check it, most erroneous notions prevailed even to a recent period. It was held to be constantly progressive and destructive, whether in the affected part or in the constitution; that it would destroy parts by ulceration; that it would

attack part after part, and that its ravages could be arrested only by the use of mercury, which was regarded as an infallible specific. Such was the general notion when Mr. Abernethy published his 'Observations on Diseases resembling the Venereal.' He asked the opinions of the most eminent surgeons then living in London, among whom were the late Messrs. Cline and J. Pearson, two gentlemen in whose experience and judgment the greatest confidence was placed. These, and other surgeons consulted on the occasion, were unanimous in the opinion above mentioned. Hence it followed that a disease which had got well without the use of mercury could not have been syphilitic: this was the belief of Astruc; it was also the doctrine of J. Hunter, who has founded much of his reasoning on this supposition; and it was adopted from the latter by Mr. Abernethy, whose representations in the publication just mentioned are entirely founded on this view, which, indeed, he assumes as the basis of his arguments. Hence arose the distinction made by Mr. Hunter, in the case of diseases resulting from the common source of sexual intercourse between syphilis and diseases resembling it, but which are not syphilitic.

It has been discovered, of late years, that these notions are entirely unfounded; that syphilis does not necessarily possess this destructive character, either in its separate symptoms or collectively; and finally that in every shape, whether primary or secondary, it may get well without the employment of mercury. Indeed, so complete has been the revolution of opinion on this subject, that some surgeons, including persons of experience and judgment, have entirely discarded the use of mercury in these affections, regarding it as not only unnecessary but prejudicial.

The extensive prevalence of these erroneous notions, and the firm faith with which they were held, are calculated to

teach us a salutary lesson, that of examining for ourselves the evidence of general doctrines, and distrusting the authority even of the highest names, in matters of opinion. The subversion of the long-established criterion has of course overthrown all the speculations built upon it respecting syphilis, and diseases resembling syphilis, but not being venereal. Hence we may altogether discard the expressions of pseudo-syphilis, syphiloid diseases, cachexia syphiloidea, sequelæ of syphilis, terms, which having either no distinct meaning, or an erroneous one, have only tended to perplex and embarrass us in investigating a naturally difficult subject.

The most important feature in the natural history of this disease is the succession of the secondary or constitutional to the primary or local symptoms, and the successive appearance of the various constitutional affections. These are renewed from time to time in some instances, being often severe in their local and general effects, and requiring the employment of remedies that act powerfully on the system. Thus in some cases the constitution is ultimately enfeebled, or the patient sinks under the complaint and the remedies. This happens, however, only in a few instances.

Persons are liable to syphilis repeatedly. One attack does not protect the constitution, as in smallpox, cow-pox, &c.

Treatment.—Surgeons have naturally directed their attention to the specific nature of syphilis, to the peculiar ravages that it causes locally, to its effect in interrupting health for months or years, and finally weakening the constitution. They have looked for a specific remedy, for something possessing, or supposed to possess antisyphilitic virtues, that is, capable of counteracting the effects of the morbid poison, and thus of checking and eradicating the disease. They have believed that mercury possesses such power, and there-

fore have generally trusted to it in the management of syphilis. Even when dissatisfied with this supposed antidote, on account of its injurious effects in some cases, they have still endeavoured to find some other specific. Hence they have attended too little to the circumstances of common nature presented by syphilitic diseases, and to the indications of common treatment.

Let us, for a moment, take a different view, and forgetting the specific origin of the mischief, inquire whether the various affections called syphilitic are entirely peculiar, or whether they do not bear such a resemblance to other diseases in their essential nature as to make it probable that they may be beneficially treated, to a greater or less extent, by what may be called ordinary in opposition to specific remedies. They are inflammations, acute and chronic, with their several results, constitutional disturbance, inflammatory, irritative, or hectic; pain more or less considerable, often very great, with emaciation, loss of rest, appetite, and strength. These affections may be combated in great measure by ordinary means, by local treatment and diet, with rest, saline and antimonial medicines, by means capable of exciting absorption, by narcotics and restoratives.

Reduced diet, at least abstinence from fermented liquors and solid animal food, is generally proper, whatever treatment may be adopted in other respects, unless in those whose powers are lowered by protracted disease and treatment; 1312 cases, including primary and secondary symptoms, were treated at the Val de Grace, from April, 1825, to July, 1827, some with mercury, some without. Some had animal diet, some "régime végétal et adoucissant." The average duration of the cases on meat diet was fifty-five days, of the others thirty-three. 'Archives,' xx, 441.

MERCURY; ITS PREPARATIONS, MODES OF ADMINISTRATION AND EFFECTS.

Mercury is employed in the treatment of syphilis, either simply as a local application or as a remedy capable of producing a powerful influence on the system; and through that influence, of arresting the progress of the disease, and ultimately curing it. In the metallic form it is inert; it produces no effect upon the human body; it may be swallowed in large quantity, and will do neither good nor harm. It exercises no influence except when it is combined with oxygen, or with an acid.

Of the forms in which mercury is used as a local application, perhaps the most common is that ordinarily called the *black wash*, an unchemical combination of calomel with lime-water, the proportion being fifteen grains of calomel to the ounce. This is used as a lotion, by dipping lint into it and applying it to sores. If not the very best, it is one of the best modes of employing mercury locally. Another lotion, called *yellow wash*, is a combination of bichloride of mercury (corrosive sublimate) with lime-water, in the proportion of two grains to an ounce. This is used in the same way as the preceding. We have the mercurial ointment, which, however, is not frequently applied to venereal sores. There is also the red precipitate ointment (Unguentum Hydrargyri Nitrico-oxidi), which is in general use; and the citrine ointment (Unguentum Hydrargyri Nitratis), which is not frequenty employed in venereal cases.

Another mode in which mercury is employed locally, is by fumigation; and for this purpose the red sulphuret of mercury, or cinnabar (Hydrargyri Sulphuretum rubrum), is commonly

used. An apparatus is employed for the purpose, consisting of a small grate, a thick piece of iron and a funnel: the iron, heated red hot, is placed on the grate, and half a dram or a dram of cinnabar is thrown on the iron, over which the funnel, which has a straight or curved tube, is then placed. The cinnabar is volatilized by the heat, and rises in the form of white fumes, which are directed against an ulcerated surface by the tube of the funnel, and form on it a whitish pellicle.

The peculiar effect of mercury upon the constitution can be produced either by applying certain preparations to the surface of the body, or by administering others internally. The most common mode of external use is by friction, that is, rubbing on the inside of the thighs, before the fire, for the space of twenty or thirty minutes every night, a dram of the strong mercurial ointment; sometimes half a dram only is employed. It may be necessary to rub twice a day. When the rubbing is ended, most of the ointment will be found to have disappeared; it may be said to have been rubbed in. The patient should not wipe off what remains, but put on a pair of flannel drawers, and wear them during the process. If pimples should break out by rubbing the ointment on the inside of the thighs, the patient must vary the part on which he rubs. And inasmuch as some of the ointment sticks on the skin, it is necessary to wash the surface clean every third night, before beginning to rub in. When mercurial ointment is employed in this way, it is capable of producing the same general effect on the system as when other forms are taken internally. It should seem that the ointment is forced through the cuticle by the rubbing, so that it may be taken up and pass into the system. Simple external application is not sufficient for the purpose. It must, however, be observed, that if the ointment be spread rather thickly on flannel, applied on a part, the testicle, for example, every night, and

kept on through the night, the system will gradually be affected. The same effect may be produced by smearing the ointment on the armpit, and leaving it there during the night.

A principal advantage attending this mode of employing mercury is, that it does not produce those unfavorable effects on the alimentary canal, and other parts of the system, which the internal use of mercury frequently does, or it produces them in a much less degree. Hence it used to be the general mode of administering the remedy for the purpose of affecting the system. The troublesome nature of the process has probably led to its general discontinuance, though it is still resorted to occasionally with advantage.

Mercury may be introduced into the system by general fumigation of the surface. If the naked body be placed in a box, at the top of which there is an opening made for the head to pass out; and if some preparation of mercury be volatilized by means of a hot iron placed on a grate in an opening at the bottom of the box, the whole surface being exposed to such fumigation, a very speedy affection of the system may be produced. For this purpose the gray oxide, or cinnabar, may be employed. The cinnabar, however, is too active to be used in this way. Indeed, the mere local use of it in the way of fumigation, sometimes affects the system. Cinnabar fumigation has been used in some ulcerations of the throat, and I have sometimes seen salivation produced on such occasions.

The mildest and safest form of mercury for internal use is the Hydrargyrum cum cretâ, in which the metal is brought into the state of oxide by trituration with chalk: this is familiarly known as a domestic remedy under the name of gray powder. It possesses, at the same time, sufficient power as an antisyphilitic for the great majority of cases. In the dose of three or four grains three times daily it will soon affect the

system. The blue pill, although mild, is more active: four or five grains may be given two or three times a day, and it may be substituted for the gray powder when that seems inefficient: sometimes to each blue pill there may be added a grain of calomel. This last substance, so well known under its own name, now called Hydrargyri Chloridum, is more active than the two preceding, and therefore available when the object is to mercurialize the patient quickly: it may be given in doses of two grains combined with the fourth or third of a grain of opium, three or four times in the twenty-four hours. A similar addition of opium may be necessary to the blue pill or gray powder. Calomel may be given in grain or half-grain doses two or three times daily, without or with a little opium. Sometimes calomel has been administered in a single nightly dose of three, four, or five grains, with one grain of opium.

For producing the desired influence of mercury on the constitution as an antisyphilitic remedy, I prefer the gray powder or the blue pill, seldom resorting to calomel. The external plan by friction is equally advantageous and perhaps safer, but patients are seldom willing to adopt it, especially as the judicious employment of the internal remedies answers all purposes.

The 'London Pharmacopœia' has an iodide and a biniodide of mercury: the former may be given in the dose of a grain three times daily, and the quantity may be gradually increased to three grains. Its effect on the constitution is not distinguishable from that of mercury. The latter is used as an external remedy in the form of ointment.

The bichloride of mercury, or corrosive sublimate, is another form employed in certain cases, though it is an irritant poison, even in quantities not to be called large. It must be given in small doses, and its effects must be cautiously observed. In this country it is not used in the general treatment of

syphilis, being resorted to where small doses, such as the eighth or sixteenth of a grain, are to be administered, more especially where there may be some doubt respecting the propriety of using mercury at all, when the small quantity last mentioned may be given two or three times a day. It was introduced into practice in consequence of the encomiums bestowed on it by Van Swieten, who practised at Vienna; hence it came to be used generally on the continent, particularly in France, where it was exhibited in solution under the name of 'Liqueur de Van Swieten.' Forty years ago all the cases, whether of primary or secondary symptoms, at the Venereal Hospital in Paris, were treated with this remedy. The formula thus employed contained one grain of bichloride in an ounce of distilled water, and the quantity usually given was half an ounce, that is, half a grain twice a day, rather a large allowance. The remedy was carried round with the physicians when they made their visits, and the requisite portion was poured out and drank by each patient in the presence of the medical attendant; so that at all events the administration of the remedy was ascertained. The dose was generally taken in milk or thin mucilage. The Liquor Hydrargyri Bichloridi of the 'London Pharmacopœia,' has half a grain of bichloride in an ounce, so that one dram contains the sixteenth part of a grain. A grain may be dissolved in an ounce of tincture of bark; a teaspoonful, which contains the eighth of a grain, may be taken three times a day.

The red oxide of mercury, which was formerly called Hydrargyrum Calcinatum, was at one time occasionally given for the purpose of affecting the system; a grain, or a grain and a half, being administered twice a-day, generally in combination with opium. This is a powerful agent, and irritates the alimentary canal; hence, having no particular advantages, it is now discarded from practice, at least in this country.

On the use of mercury.—This remedy was universally employed in England for the cure of syphilis, from the remote time of its first introduction into practice to the early years of the present century, under the belief of the disease being constantly progressive, and only to be cured by this treatment. That this was general is clear from the opinions which Mr. Abernethy collected from the great surgical authorities of London before he published his 'Observations on Diseases resembling the Venereal,' in 1804.

All the persons received into the syphilitic wards of the London hospitals were subjected to mercurial treatment, generally by friction, and carried, in most cases, to the extent of salivation. The contaminated and offensive atmosphere inseparable from such a course of proceeding fully justified the name of foul wards, which may possibly have been applied to these apartments in the first instance to denote the moral stain implied by the contraction of the complaint. Although this opinion respecting the nature and cure of syphilis was held with undoubting faith in England, and I believe in France also, evidence was slowly arising elsewhere calculated not merely to raise doubts on the subject, but to show that it was altogether unfounded. We learn from Dr. Ferguson that the use of mercury had been almost completely abandoned in Portugal, without any unfavorable result, and British surgeons saw the entire disuse of mercury by their colleagues in charge of foreign troops in the British service in many instances during the great war.

Mercury, when employed freely and indiscriminately, as it was formerly, and especially in repeated courses, disturbs health so seriously, not without suspicion of aggravating the disease, that surgeons at various times have turned their attention to the discovery of some other treatment by which the symptoms might be more safely controlled. Thus,

various other articles have been proposed as remedies for the venereal disease; and cases have been published in which these, various as they are in their nature, are said to have produced the desired effect of curing the complaint.

According to the prevalent notion of mercury being the only remedy for the venereal disease, when a cure was stated to have been effected by other means, such as sarsaparilla, guaiacum, mezereon, nitric acid, or various other things, it was said the patients got well, because they had not the true venereal disease. We can have no doubt in admitting that the cases which were supposed to be incorrectly reported, or not to have been truly venereal, were really syphilitic. The clearest evidence however, respecting this point, that mercury is not necessary to the cure of syphilis, has been afforded by the investigations of the late Mr. Rose, surgeon of St. George's Hospital. He has the great merit of having been the first to submit the matter to direct experiment. He had charge of a battalion of the Coldstream Guards, then stationed in London, and having intercourse with the lowest prostitutes of the town, thus affording abundance of cases. He determined to treat all the primary symptoms that might occur in the battalion simply by common antiphlogistic means, whether they had the characters supposed to be those of true syphilis or any other. He resolved, in short, that all should be treated without mercury. The result of his experience is contained in a paper published in the eighth volume of the 'Medico-Chirurgical Transactions,' entitled 'Observations on the Treatment of Syphilis, with an Account of several Cases of that Disease, in which a Cure was effected without the use of Mercury.' After following this plan for two years, he found that all primary syphilitic symptoms could be cured without the employment of mercury; whether they were indurated chancres, superficial sores, or whatever

character they might have presented. Ordinary antiphlogistic means simply, with rest and reduced diet, were sufficient, no mercury having been employed during that time in any primary or secondary syphilitic affections. He says that in most instances the cure was slower than if mercury had been used, though in some the sores healed rapidly. It appears, too, that there was a greater number of secondary affections, but that those were always mild, and that they gave way to simple treatment without mercury. Thus he overturned the hitherto prevalent notion of mercury being absolutely necessary for arresting the progress of the disease, and showed that syphilis does not possess that destructive character which had been previously ascribed to it. In my opinion this is the most important step that has been taken towards understanding the nature and treatment of the venereal disease; and I should place the truth, thus established by Mr. Rose, far beyond any of the speculations that are contained even in the work of Mr. Hunter.

In consequence of the researches of Mr. Rose, the non-mercurial treatment of the venereal disease has been extensively tried in the British army; and registers have been kept at the Army Medical Board showing the result of the treatment, both with and without mercury, from which comparative estimates of the two plans may be made. In other parts of Europe similar investigations have been carried on, with similar results; and the consequence of these inquiries has been a general revolution of opinion on the subject, and a corresponding change in practice. Persons who have the venereal disease are now no longer doomed to go through those long and severe courses of mercury which they underwent heretofore.

Mr. Rose, like Dr. Ferguson, had enjoyed opportunities during the Peninsular campaigns of observing how little

attention was paid by the Portuguese and Spaniards to the earlier stages of syphilis, and he was surprised not only at seeing primary sores cured without mercury, but also on finding that no subsequent ill consequences ensued. He saw some similar instances among the British soldiers, and was puzzled by the contrast which the continued good health of those persons presented with Mr. Hunter's alarming account of the terrible effects which must have ensued when the means of cure were not understood, and the description of the ravages said to have been caused by syphilis at the period of its imaginary origin. There can be little doubt that the two latter were, to say the least, greatly exaggerated. In the same way an apparently circumstantial account was given of great destruction caused by the introduction of the disease into Otaheite, which was discovered by subsequent observations to have been entirely unfounded.

Although the researches of Mr. Rose, supported as they have been by other concurrent evidence, entirely overthrew the long-established doctrine that the cure of syphilis without the use of mercury is impossible, and thus proved that repeated and injurious courses of the remedy are quite unnecessary, they do not and were not intended by that gentleman to show that the remedy ought to be altogether discarded, that it has no special power over the disease, or that it ought not to be still retained, under proper management, as the principal means of treating a large portion of venereal affections. I must, therefore, express my entire dissent from the opinions of a distinguished teacher, the late Dr. John Thompson, Professor of Pathology in the University of Edinburgh, who entirely abandoned the use of mercury both in primary and secondary syphilis, considering not only that patients recover much better without it, but that many of the affections regarded as the secondary symptoms of syphilis,

especially in their more aggravated forms, are owing to the use of mercury. For many years before his death he trusted entirely to the simple decoction of sarsaparilla in all forms and stages of the disease. It is likely enough that too free use of a remedy under an exaggerated notion of its powers, should be followed by the opposite mistake of disbelieving its real efficacy. These errors are gradually corrected by time, and thus it has been found necessary, in numerous instances, to resume the use of mercury after it had been entirely abandoned.

Mercury, like most other remedies, affects different individuals differently, so that we cannot mention any definite dose that could be employed by all persons under all circumstances. There are some persons in whom a quantity, such as a grain or two of blue pill, a grain or even half a grain of calomel, will produce salivation, while in others you may rub in mercury, and give calomel or blue pill in large doses, internally, without affecting the system. Hence it is necessary to proceed cautiously, and to watch the effects of mercury. You cannot safely let the patient go on for several days without seeing him; salivation may have come on in the mean time. You should inquire whether the person has taken mercury before; whether it affects him quickly and in small doses, and ascertain these points before you direct the form and quantity of the remedy.

The external use by frictions, and the internal administration of blue pill, or the gray powder may be conjoined, when we wish to produce the full effect of the remedy quickly in order to arrest dangerous disease, or when the constitution resists its influence. When the desired effect is produced, the external or internal method may be continued alone.

When mercury is employed either externally or internally, with a view to its beneficial influence in the treatment of

syphilis, it must be used continuously and daily, so as to produce its peculiar effect upon the constitution, and this effect must be maintained for some length of time, that is, for several days or weeks, until, in short, the cure is effected. This is called a course of mercury. We cannot say that the same doses, either in amount or number, are to be continued throughout. As this powerful remedy is capable of acting injuriously or at least unpleasantly, care must be taken not to carry it further than is necessary to produce the required effect on the symptoms, and to keep up that until they are removed. The case must, therefore, be watched, the quantity of mercury being diminished or increased, left off for a time, and renewed according to circumstances. This process causes little inconvenience when carefully conducted, under proper precautions in diet and general management. The action of mercury on the constitution is increased by warmth and diminished by cold; it goes on more favorably when the patient remains in a uniform temperature. It was formerly the general practice to confine the patient strictly to his chamber, and, if we should wish to produce the effect of the remedy quickly and safely, especially in weakened and delicate states of health, the patient should keep to the house, occupying an apartment of regulated temperature; under other circumstances this confinement is not necessary. Still, as the constitution is more easily disturbed by external influences under the use of mercury, exposure to cold and damp, or to the night air, which might bring on rheumatism or other disorders, should be avoided. With these precautions, persons may follow their usual occupations under the careful use of the remedy in ordinary cases. As the use of mercury generally causes some degree of feverish excitement, strong animal food with stimulating liquors would be improper. The diet should be light, broths, milk, bread, rice, and other

farinaceous articles are suitable. As the bowels may be disturbed by the remedy, acids should be avoided, such as salads, pickles, vinegar, unripe fruits, and uncooked vegetables generally. As it may be necessary to administer mercury to those in reduced health, a more generous and nutritious diet, with stimuli, may be required to sustain the powers of the constitution.

It produces a peculiar effect on the mouth. In the first place it causes an unpleasant metallic or coppery taste, which patients are most sensible of in the morning, communicating at the same time a fœtor to the breath, so that persons who have taken mercury, and do not wish that the fact should be known, must be careful not to approach too near to those from whom they wish to conceal it. It then produces a swollen, spongy, inflamed state of the gums, with looseness, and a tender condition of the teeth, so that the person is neither able to bite or masticate a hard substance, nor anything that approaches to a state of solidity. The surface of the tongue, and the mucous membrane of the lips and cheeks, undergo the same kind of inflammatory affection as the gums. The parts swell, and become very painful, and if the effect of the remedy goes on, it causes ulceration, the surface thus exposed assuming a kind of grayish or ash colour, as if it were covered with a superficial slough. In the further progress of the mercurial influence, sloughs to some depth may take place. In conjunction with these effects on the mouth, there is an increased secretion of the salivary glands, and this constitutes salivation, or ptyalism, during which a person will spit a pint, or more, in twenty-four hours. This fluid is turbid, ropy, and sometimes tinged or mixed with blood. The effect thus produced on the mouth, of which the degree now described is excessive and injurious, is considered as a criterion of that general influence of the remedy

on which we place reliance for arresting and curing syphilis; and I believe it may properly be regarded in that light. It is not, however, an essential evidence on the point. Action on the mouth is not seen in some persons, though the other effects of the remedy, including its influence on the disease may go on satisfactorily. When, therefore, the symptoms are giving way, the mercury need not be pushed because the mouth remains unaffected. Mercury cures syphilis in infants, though the mouth does not become sore.

Action of the remedy.—I have already spoken of mercury as a purgative and an alterative. It does not cure syphilis when thus used. Its purgative action, indeed, interferes with or prevents that constitutional influence on which we depend for the cure of the disease, and must therefore be arrested by the combination of opium with the mercurial.

At the same time that the effects just described are produced, a salutary influence is exerted over the syphilitic symptoms in most, but not in all cases. Ulcers, losing the ulcerative character, cease to spread. The reproductive process commences, and healing is soon completed. Lymph is absorbed from the iris. Matter is sometimes removed from a suppurated bubo. Eruptions fade and disappear. Swellings of the periosteum are dispersed. Pains of joints and limbs cease.

These various effects seem hardly reducible to any one principle, for, *prima facie*, they are in some respects contradictory. There is increased activity of absorption, by which lymph is removed from the iris, a periosteal or a glandular swelling is dispersed, or matter is taken up from a bubo. On the other hand, the process of destruction is stopped, and deposition of new matter takes place in ulcers. The contradiction, however, is only apparent, not real. The general effect of mercury is to arrest the venereal inflammation; this is the same in all the cases, while the absorption in the first

set of instances and the deposition in the others are merely the local restorative effects consequent on the cessation of the inflammation which had produced them.

The most unequivocal example of antisyphilitic influence is afforded in the action of mercury on ulcers of the throat and mouth. This remedy produces inflammation and ulceration, even sloughing of these membranes, yet it arrests syphilitic ulceration and leads to its repair. I have seen venereal ulcers of the lips and tongue healing rapidly while the mercury was causing ulceration, with ash-coloured slough, of the immediately adjoining membrane. Thus mercury showed itself at once both bane and antidote.

Mercury has been said to cure syphilis by its *specific* power, and the *specific* action of mercury is said to be that of curing syphilis.

This raises the question, what is a specific? The common and rather loose notion considers it as a remedy having a peculiar and direct action on a certain disease. The beneficial influence of remedies is often clearly explained by some general action on the system, as that of purgatives and diaphoretic medicines in fever. Mercury does not cure syphilis by its action on the bowels, the mouth, liver, kidneys, or skin, nor by excitement of the vascular system, for none of those are essential to its beneficial influence on the disease, which appears to our ignorance as a direct agency, like that of sulphur on the itch and of bark on ague. It is in this sense that mercury may be called a specific for syphilis.

Mr. Hunter says that it produces an irritation in the system which counteracts the irritation of the poison. This pretended explanation does not seem to me to carry our knowledge a single step beyond the general and popular statement that "mercury cures a pox."

Injurious effects of mercury.—When injudiciously and in-

cautiously administered, its effects, with the amount and number of doses, not being duly watched, this remedy may act prejudiciously on the system, producing effects which are in themselves a kind of disease, sometimes a serious one, requiring appropriate treatment. It may affect the mouth, producing excessive salivation; and I do not know a more painful condition than that of an individual in whom this takes place. The tongue becomes swelled, excessively sore, excoriated on the surface and edges, and presses against the teeth on each side, so that indentations are observed on the margin of the organ. Sometimes the tongue is so swollen that it protrudes out of the mouth, preventing the closure of the jaws, and becoming deeply indented by the teeth on its inferior surface, with great and constant pain. The lips are swelled, and the whole head and face participate in the tumefaction. The mucous membrane of the lips, cheeks, and throat, is highly inflamed, excoriated, ulcerated, sloughy, and excessively tender. There is at the same time an incessant and profuse discharge of fetid saliva from the mouth, continuing night and day, and almost preventing the patient from taking rest. The quantity of the discharge, under such circumstances, is beyond what I have already mentioned; frequently a quart of saliva, or more, flows from the mouth in the course of a night. Occasionally the effects are yet more serious; the gums slough, the alveolar processes perish, and the teeth themselves fall out. I had under my care an officer from the East Indies, who had been in service at Rangoon, in the Burmese war, and contracted a fever, for which mercury had been given very freely. While taking this medicine his head swelled to an enormous size, and a dreadful salivation took place: such was the deplorable state in which he embarked for England, with little expectation of reaching it alive. He recovered a little on the voyage. When he arrived

the lips and gums were enormously swelled, he could not open the mouth, and there was a constant discharge of the most horribly fetid matter I ever smelt; it was so bad that he quite scented that part of the ship in which he was stationed, so that none would go near him. I found that the whole of the teeth were so loose as to render it necessary for all to come out, and they were removed accordingly, sixteen from each jaw. Then the alveoli of both jaws came away in large pieces. In consequence of the opposed surfaces being ulcerated, the gums became united to the cheeks, so as to limit the power of moving the lower jaw to a very small extent.

Salivation is not a state endangering life, though it may prevent a person for some time from taking solid food. In the swelled, excoriated, and tender state of the tongue and throat, the patient can neither articulate nor swallow without great pain. Unfortunately, there is no direct or speedy remedy for this painful and distressing state; it will require three, four, or more weeks for the affection gradually to subside, and we cannot very materially accelerate the cessation of the symptoms. As a warm and uniform temperature promotes the action of mercury, free exposure diminishes it; so that under profuse salivation the head and jaws should be uncovered, instead of being closely tied up, as they usually are, under the notion that the mischief arises from taking cold, and exercise may be freely taken in the open air. Saline purgatives should be administered in small doses; an open state of the bowels lessens the action of mercury on the mouth.

The measure of most immediate efficacy in lessening the violent inflammation of the mouth and surrounding parts which causes the suffering in these distressing cases is the application of leeches below the edge of the lower jaw on one or both sides. Lotions and gargles are not of much avail. Frequent cleansing of the mouth by port wine and water in

equal parts, cold, is probably beneficial by its astringent action, and is agreeable. Tincture of myrrh or brandy diluted with three or four times the quantity of water may be used after a time. A solution of alum in infusion of roses, with or without the tincture, may be tried, also the chlorate of soda in solution, one ounce of Liquor Sodæ Chlorinatæ to eight or ten ounces of water. The chlorate of potash may also be tried in the dose of ten to twenty grains every six or eight hours.

When the swelling has in some degree subsided we observe ulcerations of the tongue, and superficial, ash-coloured sloughs of the mucous membrane, for which the best application is the Linimentum Æruginis of the Pharmacopœia. This is a remedy of undoubted efficacy, known formerly under the names of Mel or Unguentum Ægyptiacum, and believed to have been used by the ancients in diphtheria. It may be applied to the diseased surfaces by means of a camel-hair pencil or by lint rolled round the end of a probe, care being taken that none of it shall be swallowed. A strong solution of nitrate of silver, or the solid stick, may be used for the same purpose.

Mercury taken internally may disagree with the bowels, causing pain, griping, and purging, or tenesmus and mucous evacuations. Laudanum in chalk mixture will relieve, with discontinuance of the merurial course, which may be resumed with the addition of a little opium to the mercury. A moderate dose of rhubarb, with Pulv. Cretæ comp. c. Opio and a dram of Spiritus Myristicæ in mint water will settle the alimentary canal effectually. If the mischief recurs, the use of the remedy by friction must be substituted for its internal administration.

Sometimes mercury produces a peculiar inflammation of the skin, called eczema mercuriale. The skin becomes inflamed in patches; minute vesicles form on the inflamed

surface, as thickly set together as they can stand. These at first are hardly visible, since their contents are transparent; but they soon become opaque and purulent; they break and discharge matter, which encrusts on the surface, causing a copious, fetid discharge, which stiffens the linen and produces painful excoriation. Fresh patches of skin become inflamed and go through the same process. Thus this eczema may extend indefinitely over the body. The affection is a painful one, being attended with considerable inflammation of the skin, and irritation from the dry crusts and the exudation of matter. This complaint goes through a certain course, gradually subsiding in the parts first affected, and then coming on in others. It is the source of great pain and distress, and even high constitutional irritation when it has been allowed to become extensive. It arises from peculiarity of constitution in the individual, for it will take place without much mercury having been employed. It may occur either from the external or internal employment of the remedy; it may begin on the thighs, under the use of the ointment; and I have seen it excited by the irritation of a mercurial plaster. In the case of a person known to be subject to this affection mercury should either be not employed at all or administered with great caution, and it should be immediately discontinued if eczema is seen even in the slightest form. The affection admits of little more than palliative treatment; soothing and mild local applications should be employed. The surface may be washed and gently cleansed by means of emollient or mucilaginous fluids, milk and water, decoction of linseed, or thin gruel. Parts which are particularly sore and inflamed may be covered with a bread and water poultice. Mild unctuous applications may be employed after the inflammatory stage is gone by, in order to detach and remove the crusts that are formed on the

surface of the body, the part may then be lightly dusted with flour or the oxide of zinc in powder. Aperient medicines must be given, and saline draughts with antimony may be used.

Mercury sometimes acts as a kind of poison upon the system, accelerating the pulse, which is feeble, causing loss of flesh, appetite, and rest; a state not unlike hectic fever. Sometimes it goes further, and has a peculiar influence in disturbing the action of the heart and of the respiratory organs. It causes a sense of oppression about the præcordia, an irregular action of the heart, a small, quick, intermittent pulse, coldness of the surface, and a pale, contracted countenance. These symptoms have been clearly described by the late Mr. Pearson, in a small work entitled 'Observations on some Articles of the Materia Medica in the Treatment of Syphilis,' and he calls this affection erethismus, a Greek word, about equivalent to irritation. He says that at the Lock Hospital, of which he was surgeon, he had observed that occasionally persons died suddenly, without his being able to ascribe the death to any particular cause. He was hence led to pay attention to persons who were under a mercurial course, and he found that symptoms such as I have described were occasionally produced; and that, in this depressed condition of circulation and general strength, a slight degree of exertion, such as walking across the ward, had sometimes suddenly been fatal. I once saw a marked instance of this affection in the person of a physician, who is well known by his writings, the late Dr. Bateman, who took mercury in consequence of an amaurotic affection. He was delicate, and rather of an irritable habit; and this peculiar effect of mercury on the heart and respiratory organs was produced in him to an alarming degree, so as to bring him into a state of the greatest danger, though the remedy

did not act powerfully upon the mouth. The circulation was depressed, the action of the heart was irregular, and the functions of the respiratory organs so much interrupted, that for five or six weeks his life was in the greatest danger. He has given an interesting narrative of his own case in the ninth volume of the 'Medico-Chirurgical Transactions,' under the title of "Notes of a case of Mercurial Erethismus."

Mr. Pearson observes, that the best remedies for this peculiar affection are, first, free exposure to the air; secondly, medicines of a cordial or stimulating kind, a good and generous diet, animal food, wine, and other fermented liquors. These means seem obviously calculated to raise the sinking powers of the circulating system and to give general strength. I recollect that Dr. Bateman, although a temperate person, found it necessary to take wine, and even brandy, freely, during the period that he was suffering in this way; also to take jellies and animal food in a concentrated state. When such symptoms are coming on, volatile alkali in camphor mixture is the best remedy. Mercury is to be discontinued on the very first alarm, and if the patient be in an hospital, he must be immediately removed from the mercurial atmosphere.

In the state of system produced by the action of mercury persons sometimes experience rheumatic affections. They complain of pains in the joints and limbs, and occasionally actual swelling of joints comes on. It would appear that in individuals of rheumatic constitution the employment of mercury is likely to bring the disorder into action. Hence mercury is to be used with great caution in individuals of such constitution.

To this catalogue of evils that are ascribed to the employment of mercury some persons are inclined to add considerably. They enumerate, among the prejudicial effects of the remedy, eruptions, iritis, affections of the nose, of the

bones, and of the joints, being a considerable portion of the symptoms with which we are well acquainted as the secondary symptoms of syphilis. I must observe, in the first place, that we know all the symptoms that I have just mentioned may be produced by syphilis treated without the aid of mercury; we frequently see them all in individuals that have taken no mercury; we have, therefore, clear evidence that all these effects may be produced by the disease. We have not the same kind of proof that they can be produced by mercury; on the contrary, mercury is given in many diseases besides syphilis, and to a considerable extent; but in no instance do we find it then produce eruptions like syphilis, iritis, disease of the bones, of the periosteum, or of the nose. The effects in question may then be produced by syphilis without mercury; but we have no proof that they can be caused by mercury without syphilis. It is true that mercury and syphilis, taken together, may bring forth that which neither will produce singly. I readily admit that the injudicious use of mercury and the repeated employment of it in some cases may act prejudicially on the system, and that a perseverance in its use where it exerts some of its noxious influences may aggravate the symptoms of syphilis, may cause them to return more easily, and may make them more difficult to cure. Thus, the employment of mercury, under such circumstances, may increase the difficulties which belong to the disease itself. I cannot, however, at present see any evidence that mercury is capable of producing these symptoms, which we are in the habit of witnessing as the effects of syphilitic poison, where no mercury has been used; and certainly there are mischiefs enough arising from the injudicious and imprudent use of mercury without adding those that do not belong to it. All we want is to know the truth, to learn what the remedy can effect, and what it can

not; to understand what advantages and disadvantages may attend its use, and thus to ascertain its real value.

It has been much the habit in modern times to be contented with producing a merely sensible impression on the mouth, and then to discontinue the mercury, under the notion that when the mouth is affected at all the influence on the system is sufficient for the cure of the disease. I cannot coincide with this view of the subject. There are many instances in which this slight effect on the mouth is sufficient, while in others the symptoms do not yield till the remedy is carried further. We never see the symptoms give way so quickly and favorably as when the mercury, without our having wished it, has produced salivation. I cannot, therefore, adopt the opinion of those who regard ptyalism as an occurrence interfering with the curative influence of the remedy. It is, indeed, a painful state, and not necessary to the accomplishment of our object. We should therefore proceed cautiously in the few instances in which we find it expedient to push the use of mercury further than usual, as salivation sometimes comes on quite unexpectedly. In most instances a mild effect suffices, and we manage our doses of the remedy so as to keep this up without increasing the amount of action.

Since mercury, imprudently and carelessly used, is capable of producing injurious temporary effects, and since its long-continued and repeated employment may injure health seriously and permanently, it is desirable to attain its corrective or specific influence on venereal disorders with as small a quantity of the remedy as is consistent with the object. We must therefore consider two questions, what degree of mercurial influence is necessary to arrest and cure syphilis, and how long the remedy ought to be continued. In reference to the first point, is a slight action on the

mouth sufficient? Will all the benefit that the remedy can confer be derived from it when it just perceptibly acts on the system, or may not a more considerable influence be necessary, either generally or in particular cases? Then, further, is it sufficient to continue the remedy until, ulceration having been arrested, the healing process has begun, and a healthy condition of the part is established? If we leave it off at this point, relapse of ulceration will often occur, and it is necessary to resume the treatment. We must therefore go on till cicatrization is completed. Is it of any use to go further, in order to diminish the chance of relapse or of secondary symptoms? We are still in the dark on these points, respecting which we consult the best authorities in vain. It would require a great and peculiar field of practice, a long course of time, with patient observation and mature reflexion, to collect such a body of evidence as would enable us to lay down positive rules on the subject. Mr. Hunter contends, in respect to the venereal disease, that mercury will cure the action or the existing disease, but not the disposition or the state of constitution which may lead to future appearances. The latter point is sufficiently established by the ordinary course of experience. Yet, in detailing the histories of cases, we find him going on with mercury after the symptoms had disappeared, in order to protect the constitution. Patients are often disposed to take this view of the subject, and thus the mercurial course is often continued in a mild degree for one or two weeks after the symptoms have disappeared.

The substance next in efficacy to mercury in the treatment of syphilis is the iodide of potassium, which, however, has no claim to be regarded, like mercury, as a specific against the disease generally. It exerts no power over the primary symptoms, but is very useful in the secondary affections,

more particularly in their protracted and painful states, when attended with that depression of general health under which it is desirable to avoid the use of mercury. It has little influence on the earlier and milder forms of constitutional syphilis, though very efficacious in the advanced stages of the complaint, to which the name of tertiary is sometimes applied. It is rapidly beneficial in all affections of the bony system, whether osseous, periosteal, or simply painful; also in affections of the joints. It has the advantage over mercury of not interfering with health; it produces none of the serious inconveniences so often caused by the injudicious use of that powerful remedy, though, in rare instances, it disagrees by affecting the head, the mucous membranes of the nose, eye, and throat, so considerably, that its use cannot be continued. Its employment is not inconsistent with that of mercury; indeed, the two remedies are sometimes used together with advantage. There is some ground for the remark that its influence is less permanent than that of mercury; its use, however, may be resumed when necessary, and continued for any length of time without injury to health. Its beneficial action generally takes place soon; if no good is done in a month, the remedy may be left off. The *modus operandi*, as in so many other cases, is obscure; all that we can observe is the beneficial influence of the remedy on the symptoms, which is often sudden and unmistakeable. Moderate doses, such as two to five grains three times a day, will do all the good that can be conferred by the iodide, and it very rarely disagrees in such quantity; there can be no reason for the very large doses sometimes administered. Camphor mixture is a convenient vehicle, any distilled water or simple vegetable infusion may be used, or it may be given with sarsaparilla.

Other remedies are occasionally employed in the treatment

of syphilis, without having any pretence to specific influence like mercury, or to such power over particular symptoms as that of the iodide of potassium. The principal of these is the root of sarsaparilla, which has been taken in various forms, as powder, simple and compound decoction. In the latter it is mixed with guaiacum, sassafras, and mezereon, forming a combination nearly resembling a remedy formerly of great repute under the name of Decoctum Lusitanicum, Lisbon Diet Drink. There is also an extract of the root and a fluid extract of the compound decoction. The latter form is now generally used in the dose of a dessert-spoonful in water three times a day, in preference to swallowing large quantities of the decoction. No confidence can be placed in this remedy unless it be carefully prepared from genuine articles. Great difference of opinion has prevailed among medical men on the subject of sarsaparilla, some regarding it worthless, while others ascribe to it considerable virtues, a discrepancy ascribable in some degree to difference of quantity in the article. I regard it as an excellent restorative, doing good in those instances in which, either from the long continuance of disease, from the painful nature of the symptoms, or the injurious effects of treatment, especially where mercury has been employed long or repeatedly, the constitution has been enfeebled, loss of appetite, want of rest, emaciation, and debility having been produced. It may also be employed with advantage in the cases where mercury has been found by previous experience to disagree, or where its use is inadmissible from peculiar susceptibility or delicacy of constitution.

How does sarsaparilla act? They who deny its utility allege that a person in health might drink a quart of the decoction without any effect; certainly he might do so, with no other result than that of distending his stomach. We do not understand the mode of action of many powerful

medicines. I do not pretend to explain how sarsaparilla operates, but I know by experience that it is a useful remedy. It seldom fails to render essential service in those cases of secondary syphilis where the continuance of painful disease has impaired the appetite, destroyed rest, and caused loss of flesh and strength. It is employed with equal advantage in similar states of constitution produced by other causes. It is less applicable to the treatment of primary syphilis, but may be used with advantage when the disease has been painful and obstinate, and has impaired health, particularly if it has resisted the action of mercury. Opiates are often advantageously combined with sarsaparilla. The good effects observed when sarsaparilla has been administered after a long mercurial course may arise, in some measure, from discontinuance of the latter. It is often given in conjunction with mercury, particularly the bichloride, in small doses, or blue pill; it renders the action of the mercurial milder. It is of no use when patients are in good condition; it is injurious in feverish states of the system. Under both circumstances it excites and causes headache.

Primary syphilitic or venereal sores are seldom seen except in the external organs of generation, or in their immediate neighbourhood. I say seldom, because they may occur in other quarters; I have seen them on the lip and tongue, and more frequently on the fingers. They occur in the latter situation occasionally to medical men from delivering women labouring under the disease, especially if there should be a denuded surface on the part at the time. How they are produced in the two former cases I am unable to explain. They appear most commonly on the glans and lining of the prepuce in the male; on the thin covering lining the interval between the labia in the female. They occur less frequently on the common integument, but may be seen on

the skin of the prepuce or penis and on that of the labia. They are still less common on mucous surfaces, yet the urethra and vagina are not exempt; we see them occasionally at the entrance of both canals.

Primary sores are produced by the application of infectious matter to a natural unbroken surface, or to a wound or sore. The poison acts more rapidly in the two instances last mentioned. In this way the fingers and nipples are sometimes affected. I have seen several cases in which syphilis has been contracted by the application of venereal matter to a wounded or abraded surface of a finger, but no instance in which this has occurred to the entire skin of these parts. Most of these patients have been surgeons.

A gentleman once consulted me for a violent inflammation affecting the wrist, forearm, and lower part of the arm. On the thumb there was an inflamed sore, about the size of a shilling, with considerable swelling and redness around. I asked him how this had happened? He said that it was a gnat-bite, which he had neglected, that it had festered, got worse and worse, and then his arm had inflamed. It appeared to me to be a more serious affair than a gnat-bite would produce, and that there must have been some other cause. On closer inquiry I found that three days previously he had been dining with a friend in the city, and had drank rather freely; that on returning home along the Strand he had got into conversation with a damsel, and had been silly enough to put his hands up her petticoats, but had taken no other liberty with her. When he got home he said that he found that his hand stunk very badly, and he immediately took means for cleaning it, but found difficulty in getting rid of the smell. From that time his thumb, which he felt had something the matter with it, got worse and worse. It was now apparent that syphilitic poison had been applied to the part,

and that the state of the sore was the result of such application. The first object was to reduce the inflammation, which was very severe. For this purpose leeches and other suitable measures were employed. In two or three days the inflammation of the arm and forearm had subsided, but the thumb was not at all better. I now directed the black wash, with poultice, to the part, and that he should take five grains of blue pill three times a day. He went on with this a few days, but it had produced no effect on the system, and the sore of the thumb had become worse. It was then necessary to employ mercury more actively, and I gave him calomel and opium largely, under which he became salivated; the local symptoms were soon arrested, the sore put on a healthy character, and proceeded rapidly towards healing. Not being regularly under my care, he left off the mercury before the cicatrization was complete; the consequence was that the sore spread again, and he was obliged to go through a second mercurial course before the complaint could be put a stop to, after which it was finally and permanently cured.

A surgeon once wrote to me from Lincolnshire, mentioning that he had got a painful sore on the finger or thumb, I forget which; that he had delivered a poor woman who had gone accidentally through the town in which he lived, and finding that a sore place which he had had on the thumb or finger previously, produced by a scratch, was now excessively painful, he was induced to examine the patient, and found that she had got venereal sores. The sore and the inflammation of the parts had increased rapidly, and spread into an inflamed, foul ulcer. He wrote to consult me about it, stating these circumstances, and begging to know what I thought of the case. I answered that he had got a venereal sore, and that he ought to use mercury actively. In a few days he came to town, pale, sallow, and looking ill. He showed me

the part, which was bright red; there was a large foul sore on it, which was excessively painful. He said that he had suffered much in coming to town: that he had begun to take mercury as soon as I wrote, but it had not acted on the system; he thought, however, that the progress of the sore had been checked, but he had been annoyed on the journey by another cause, namely, an attack of piles, which came on just before he left the country, and had been very painful in the coach. As he had never had piles before, I thought it strange that they should appear just at that time; but he said he was sure of the fact, because he had showed them to a surgeon, who had put caustic upon them, which had made them much more painful. On examination I found he was suffering from the excoriated and ulcerated chaps round the anus, rhagades ani, a secondary consequence of the primary sore. I enjoined confinement to the house, and an active mercurial course. The remedy took effect rapidly, and as soon as the system was affected, the sores in both situations were checked. By perseverance in this treatment, in two or three weeks he got well, and went back to the country.

I saw another gentleman who had attended a low woman in her confinement. He had a broken surface of some kind upon the finger, which became infected; it put on a thick margin, and had an unhealthy secretion: in a short time he had a swelling of the glands in the axilla, and a scaly eruption about the body. These got well when the system was thoroughly affected with mercury.

Thus we see that syphilis may be contracted in other ways as well as through the sexual organs, and it is of consequence for those who have to practise on patients who may labour under syphilitic disease, and have to handle the organs of generation, to take great care that they do not allow any discharge to come in contact with recent wounds or ulcers.

These have been inoculations by the secretion of primary sores. Can a similar effect be produced through the medium of secondary symptoms? Women may be infected through the nipples from suckling syphilitic children. Delpech relates the case of a surgeon who had injured his fore-finger. He examined some excoriated chaps around the anus, which are secondary affections, and the moisture produced from them (*suintement*) came in contact with the sore part. Itching and pain in the finger came on almost immediately; ulceration of the wound and swelling of its circumference next day; then humeral and axillary buboes. These primary effects were followed by pustules over the body, ulcerations of the palate and nose, and six years of disease and treatment. ('Chirurgie clinique,' i, 336.)

The local effect in the case of a sound surface follows the application of the poisonous matter, not immediately, but after an interval of time more or less considerable, as in smallpox, cow-pox, hydrophobia. This interval, which is generally about a week or ten days, is sometimes less, and sometimes protracted to five or six weeks.

Mr. Hunter says that chancres may appear in twenty-four hours after connexion, or not till the end of seven weeks. He saw one instance in which there was an interval of two months. When venereal matter is applied to the surface of a wound or sore, as in the cases already mentioned of the fingers, an effect takes place at once, that is, pain or itching is felt immediately, and recognisable changes are found in twenty-four hours.

Primary venereal sores are at first inflammations of the skin, often pimples, minute vesicles or pustules. The cuticle is broken, and ulceration takes place: there is loss of substance, with sharp edge, grayish or yellowish surface, commonly but not invariably circular figure.

There are many varieties of primary sores, which may be reduced to the following heads:

I. *Simple venereal sore* (venerola vulgaris, Evans).—One or more; often a series behind the corona glandis, or at the orifice of the prepuce; sometimes painful, and bleeding on slight occasions. They go through certain successive stages:

1. Ulceration. Slight excavation, with grayish or tawny surface, and sharp edge.

2. Filling up to a level with the sound skin, and rising above it—*ulcus elevatum.*

3. Cicatrization.

This progress occupies four, five or six weeks.

a. Sore at the base of the frænum, generally ulcerating through and destroying it.

b. Fissures of prepuce.

c. Ulcers on glans, superficial, and not becoming elevated, or indurated.

II. Ulcer with slightly raised edge, on the integument of the penis, of circular figure, with smooth surface and little discharge, forming a thin incrustation, and not painful. There may be one or more, of the size of a sixpence to that of a half-crown; under neglect, sometimes attaining a more considerable magnitude. These sores, common enough among the lower orders, are not met with in private practice.

III. Indurated sore; Hunterian chancre.

Mr. Hunter entertained the notion that the venereal poison, as a specific irritant, would produce on the parts to which it is applied a certain regular effect of definite character and progress, as is the case in smallpox, cow-pox, or the itch. Thus he says that "a chancre has commonly a thickened base, and although in some the common inflammation spreads much further, yet the specific is confined to this base." Again, in describing the development of the

sore, he says, "a thickening of the part commences, which at first, and while of the true venereal kind, is very circumscribed, not diffusing itself gradually and imperceptibly into the surrounding parts, but terminating rather abruptly. Its base is hard, and the edges a little prominent." Had he discarded preconceived notions and current doctrines, and applied to primary syphilis his great powers of original observation and reflection, he certainly would not have been satisfied with this meagre account of the subject, which is altogether imperfect, even in reference to one, and that by no means the most frequent form of the disease. The character of induration is seen in primary sores under different aspects; it may be in moderate degree, and might be called thickening with firmness rather than induration. There may be a considerable lump under the skin, generally without redness, often not existing at first, but gradually developed. If you take the part between the finger and thumb, you might suppose that there is a piece of cartilage below the surface to which the skin closely adheres. The ulceration, which is superficial or a little excavated, is seldom large; it is slow in progress and unattended with pain. The induration often remains after the sore has healed, and that for a long time; and I have seen it occur in conjunction with secondary symptoms twelve months after the cure of the primary disease. It has not yet been shown that this kind of primary symptom owes its origin to any peculiarity in the poison which has caused it. There is, however, no doubt that a certain structure is necessary to its production, namely, some amount of loose cellular tissue. Hence it is most frequent in the fold of prepuce behind the glans, and in the lining of the prepuce. It is hardly met with in the glans, where the quantity of this structure is extremely small, and it is but rarely seen in the common integument of the prepuce. When the corona glandis and contiguous portion

of the prepuce are involved in a common sore, the latter will be indurated, but not the former.

The great respect, amounting almost to veneration, in which the authority of Mr. Hunter has always been held, especially in reference to a subject on which he had bestowed much thought, has led to the general adoption of his views respecting the primary venereal sore or chancre, as he always calls it, and succeeding writers and teachers have generally adopted his description, instead of examining for themselves.

The greater number of primary syphilitic sores have no indurated base or edge; yet, because Mr. Hunter has so described it, this form has been adopted as the criterion of a venereal sore, and has been called the true venereal chancre, all others being deemed not syphilitic. Primary sores, as well as other symptoms, differ; yet the various forms equally result from infection: one kind is just as true syphilis as another. Because, however, primary venereal sores do not generally correspond to what Mr. Hunter has described under the name of chancre, and because syphilis deviates in other respects from the description he has given, it has not only been fancied, but asserted even by writers of high authority, that the disease has changed its character since Mr. Hunter wrote. I think it more probable that he should have been mistaken or inaccurate, than that nature should have changed; and I cannot help calling to mind the short but pithy remark of a great writer of antiquity:

"Opinionum commenta delet dies; naturæ judicia confirmat."

When we refer to the descriptions given by ancient writers of the diseases which we now observe we find them in perfect accordance with our present experience; and I see no reason for believing that nature has changed in this more than in other cases. Considering Mr. Hunter's entire confidence in the

mercurial test, as applied to his conclusions respecting syphilis, and the fanciful speculations and the contradictory statements which abound in his celebrated work, I cannot help classing some of his views among the "opinionum commenta" rather than with the "naturæ judicia."

IV. Simple excoriation; mere removal of cuticle. When seated on the prepuce, sometimes attended with induration in a slight degree.

Some persons, fancying that the venereal poison must produce a peculiar effect, that this must be an ulcerative excavation, more especially with indurated base, seem to consider that a simple abrasion of cuticle cannot be the effect of an animal poison, they say "that's an excoriation! it is not venereal." I have no doubt that the primary effect of the venereal poison may be either a mere excoriation or a sore of the most superficial kind; and that secondary symptoms may follow such primary affections.

V. Inflammation of the glans and prepuce, with excoriation, and fetid puriform discharge—*gonorrhœa præputii.*

a. Simple inflammation, with increased and altered secretion.

b. Inflammation, with exoriation, in red and white patches, and superficial ulceration.

c. Inflammation, with ulcer, at the base of the prepuce.

VI. *Phagedænic sore.* All ulceration is phagedænic in its origin and progress; that is, there is destruction of parts. In the venereal sores already considered this loss is inconsiderable in extent, and proceeds slowly. In phagedænic primary sores, the destruction of parts by ulceration is more considerable: they seem eaten away, and a conspicuous loss of substance is soon produced. The margin of the sore is sharp, generally irregular; portions of it turn livid and then perish. The surface is irregular, tawny, or livid, without any attempt at repair. There is no surrounding hardness.

a. Rapid destruction, with a corroded livid surface, red edge, and severe pain.

b. Slower progress, creeping on for some weeks, and destroying the glans or prepuce without much pain.

VII. *Sloughing sore*. We see two kinds of this affection on the genitals.

The sloughing sore and the phagedænic form of the disease are nearly allied in nature, differing chiefly in the degree of mischief, and in the course of the affection. Whether the more or less formidable character of these sores depends on anything specific in the irritating or poisonous matter to which they owe their origin, or either to peculiarity of constitution, or state of health in the patient, is at present unknown. Within my own experience, they have occurred to persons in whom there was neither observable imperfection of constitution nor impaired state of health, the disease having been received from persons in whom there could have been no malady of great virulence, or any material deviation from the state of health, inasmuch as the peculiar characters and circumstances of the disease, especially the painful state of the sexual organs, and the concomitant constitutional disturbance, could not fail to preclude the possibility of sexual intercourse. In one form of the complaint the sloughing is obviously brought on by irregularities in the conduct of the individual. The circumstance already mentioned (at p. 352) of the destructive character of the disease contracted by the British troops in Portugal, from intercourse with native females, in whom venereal affections were of the slightest character, involves the question in considerable uncertainty and doubt.

The most frequent form of sloughing sore is that brought on by high inflammation, the effect of neglect and intemperance, that is, by various causes of excitement, external and

internal, acting on an affection in its nature inflammatory. An ordinary sore is situated on the glans, particularly on the corona, or at the base of the prepuce. Under want of care and probably irregularities of all kinds, it becomes inflamed; the prepuce inflames, swells, becomes bright red, and cannot be drawn back, while an offensive ichor or bloody and dark-coloured matter flows from its contracted orifice. There is probably a full and strong pulse, with headache, white tongue, and restlessness. When the parts are exposed by slitting the prepuce, a larger or smaller slough of the glans is seen at its back part, of dull gray or brownish colour, the glans itself being swelled, sometimes with pustules on the surface, and the lining of the prepuce is either ulcerated, thickened by inflammation, or in incipient disorganization. The slough extends deeply between the glans and corpora cavernosa, but not so as to open the urethra; when it is detached, and granulation has commenced, there is a deep chasm, at the bottom of which the front ends of the corpora cavernosa are seen. As the slough passes through the blood-vessels of the glans, bleeding often takes place at the time of separation, which, although usually profuse, generally stops of itself by causing fainting; it may, however, require ligature or some styptic. The separation of the slough is followed by healthy granulation, with subsidence of all the local disturbance and speedy recovery. There is no fear of secondary symptoms.

In other instances the affection is of sloughing character from the beginning, commencing with a vesicle or pustule, which opens into an angry and painful sore. Sooner or later the part becomes dark, blackish or brownish, with an offensive ichorous discharge. There is generally, but not always, surrounding inflammation, with pain, and constitutional disturbance. Under appropriate treatment, of which division of

the prepuce is generally a necessary part, the dead portion is separated, leaving a loss of substance, which is filled by granulation, and healing ensues without any liability to secondary symptoms. Such cases are rare. I had an instance under my care in St. Bartholomew's, in a healthy girl about twenty. There was a softish, dark slough on the inner side and lower part of the labium, about an inch in length, and at least half as broad, with little surrounding disturbance or pain. Her story, which there was no reason to disbelieve, was to the effect that she was servant in a family not far from the hospital, that she had been induced to go to a fair in the neighbourhood of London, where she had a single connexion with a companion. She was kept in bed with poultice to the part, under which the slough separated, and healing followed without any other inconvenience.

A gentleman, about sixty, of good fortune and regular habits, who could not have contracted the disease from any low source, came to consult me from a few miles in the country, being in good general health. When he opened his dress, I immediately recognised the fœtor of sloughing phagedæna. There was a soft, dark-brown slough on the side of the glans, about the size and form of a horse-bean, and, as it appeared when separated, about the depth of such a body. The glans was not much swelled, nor was there much pain; the prepuce could be withdrawn so as to denude the glans. Rest in bed, with soothing local treatment, checked the progress of the complaint, but there was more or less aching pain from the pressure of the prepuce, although that part was not inflamed: I therefore divided it on the third day, when all uneasiness ceased. The separation of the slough, and the repair of the chasm by granulation and cicatrization were soon complete, and nothing further ensued.

A gentleman, twenty-two years of age, having had a suspi-

cious connexion, perceived on the eleventh day a small whitish place on the glans, for which caustic was used, giving a little pain. On the following day the place was larger, with foul discharge and very painful. He was worse on the fourteenth day, when three grains of calomel with half a grain of opium were ordered every six hours. He came to me on the following day, when he had taken four of the pills, and found himself worse. The peculiar fœtor of sloughing phagedæna was immediately recognisable. The prepuce was inflamed, and slightly œdematous, the glans, equally red, protruded about half-way at the orifice. The prepuce could be withdrawn with a little difficulty, so as to expose a sore about the size of a shilling, of which about two thirds were on the glans, the remainder on the root of the prepuce. It had the pulpy, brownish, and bloody surface of sloughing phagedæna, with one black portion, and it projected above the margin of the ulcer. It discharged a thin, red, and extremely offensive ichor. The neighbouring internal surface of the prepuce was highly inflamed; the whole penis very painful. Twelve leeches to the penis, and poppy fomentation. In the evening, although the pain was lessened and the discharge thicker, the pulse was full and hard, twelve ounces of blood were taken from the arm. On the fifteenth day the fœtor of the discharge had gone, the parts very tender to the touch and occasionally painful. Twelve leeches. On the 16th the discharge was a thin matter, neither sanious nor fetid; the prepuce, being still inflamed and tender, was slit up, the sore being larger, and presenting an excavation that would hold a nut. The progress after this time was completely favorable, and cicatrization was accomplished in little more than a month from the beginning of the symptoms. There were no secondary symptoms.

If elderly persons of debilitated frames, such especially as

have led an irregular life, should be attacked by primary syphilis in the sloughing form, the disorganizing process may extend rapidly without previous local disturbance of violent character or great constitutional excitement. Here the only chance of safety lies in immediate recourse to the most powerful means, dietetic and remedial, of rousing and maintaining the failing powers of the constitution.

Primary sores are sometimes attended with a peculiar disorganization of the affected tissues, by which they are converted into a kind of white slough, that is, a whitish or yellowish substance, generally of a tough or firm texture, adhering closely to the surface, spreading slowly without much inflammation, and gradually separated in the natural progress of the affection or under the influence of mercury. This kind of slough may cover the surface, either generally or partially, and seems analogous to the grayish or whitish substance so frequently seen in secondary ulcerations. I have seen a small mass of induration form at some depth near the side of the glans, and slowly come to the surface, then exposed and loosened in a firm fibrous lump, bigger than a horse-bean, having an excavation which was soon filled up by granulations. This white kind of disorganization, which may be accompanied by active inflammation, is more controllable and less alarming than the blackish or brownish sloughs.

I saw a gentleman with a sore on the corona glandis and neighbouring part of the prepuce, which had existed three weeks, during which he had lived freely as usual, without any treatment. The ulcer, as large as a sixpence, was excavated, with a dirty-white surface, as if from a covering of tough, white substance; it was very sensitive. I ordered black wash, five grains of blue pill night and morning, and a dram of mercurial ointment to be rubbed in each night. There was a strong mercurial action in three days, so that it

was necessary to leave off; the part was much better. At the end of ten days, the mouth being still very sore, the ulcer was becoming clean by the separation of a tough, white kind of slough, which was found to have extended deeply; the exposed surface was healthy as far as the separation had extended, and in another week the cicatrix was complete.

Diagnosis. The doctrines promulgated of late years respecting the peculiar characters of true venereal sores, respecting syphilis, and the diseases said to resemble it without being venereal, that is, between syphilis and pseudo-syphilis, have occasioned much needless perplexity to practitioners, who were unable to recognise, in the majority of cases, the characters ascribed to the genuine disease. They were pursuing a chimera, and were inevitably disappointed and perplexed. The affair, in truth, is very simple. When ulcerations occur, in healthy individuals, at an interval varying from a few days to a much longer time, after connexion with females who receive a plurality of visitors, they are syphilitic in ninety-nine cases out of a hundred, or a still greater proportion, whatever the characters of the sores may be. The criteria of primary syphilis, therefore, would be sexual intercourse with women leading a life of prostitution or at least unchaste, and the manifestation of the disease after a longer or shorter interval during which the part has been perfectly healthy. A further evidence, which the lapse of time only can afford, is the occurrence of secondary or constitutional symptoms. When this has been added to the two former circumstances, the disease is syphilis, whatever may have been the character of the original sore.

The anxious inquirers on the vexed question of true syphilis might have spared themselves trouble by observing the direct statements of Mr. Abernethy, that "the fictitious disease in appearance so exactly resembles syphilis, that no observation,

however acute, seems to be capable of deciding on its nature;" and that all his reasoning is founded "upon the presumption that diseases which get well spontaneously are not syphilitic." ('Observations on Diseases resembling Syphilis,' pp. 44, 54.)

The generative organs, like other parts, are liable to common disease, and thus may present appearances liable to be confounded, from their situation, with those resulting from syphilis, but easily distinguishable.

Laceration or excoriation of the male or female organs may occur in intercourse, with slight bleeding; the effect being immediate, and probably without suspicion of infection. This may be more probable if the secretions of the female organs should be unhealthy, though without suspicion of infection. Accumulation of the sebaceous secretion may irritate the corona glandis or the lining of the prepuce.

In herpes præputii, there are one or two small red patches on the integument of the prepuce, on each of which a small cluster of vesicles, four or six in number, is developed. Transparent at first, they soon become opaque, and then dry up: such vesicles may form on the glans. In psoriasis præputii there is thickening, with fissures of the orifice of the prepuce. This and the preceding affection are altogether unlike any primary syphilitic sore, and occur most frequently when there has been no exposure to infection. Small vesicles or pustules are sometimes seen on the glans in conjunction with stricture or irritation of the urethra.

The foregoing account is a simple enumeration of the sores caused by infection in sexual intercourse, according to their obvious characters, and not involving any doctrinal points. Such sores have been arranged in two divisions, the hard and soft primary sores. The terms are ill chosen as applied to ulcerated surfaces, of which the differences in consistence are so slight as to be hardly recognisable. By hard chancre is

probably meant the sore with indurated base; the others are distinguished from this, not by being soft, but by wanting the firm basis. In many cases this induration, not existing in the early stage, is developed gradually, so that the same sore would be soft and hard in different stages of its progress.

Sores have again been divided into infecting and non-infecting, thus reviving the old and happily forgotten pseudo-syphilitic doctrine, without the name. This would be an important pathological and practical distinction, if true. Before these terms are adopted, the difference which they express in the essential nature of the affections should be clearly established, which is far from being the case at present.

Treatment of primary sores. As the mischief proceeds from the direct application of a local irritant or poison, the notion has been entertained that its progress might be prevented by excision in an early stage, or effective destruction of the surface by an escharotic. I have not seen or known of any instance in which the former proceeding has been resorted to. It would be so obviously inapplicable to the greater number of primary affections, that we may doubt whether it has ever been actually put in practice. The nitrate of silver may be safely tried while the sore is small, and a second application, after the effect of the first has gone off, may be made. It has been strongly asserted that if this is done within four days from the first appearance of the sore, there will be no danger of secondary symptoms. Without guaranteeing this statement, I see no objection to the proceeding. We seldom see cases early enough to try the principle fairly.

It is clearly established, by general experience, that mercury is prejudicial in sloughing sores, that it aggravates all the symptoms, local and general, and that it may lead to large or entire loss of the glans, prepuce, or penis. Where the

mischief has been brought on by high inflammation, as the effect of neglect or intemperance, and complicated with phymosis, the penis, and especially the prepuce, being swelled, red, and shining, with offensive ichorous or sanious discharge from its contracted orifice, the indication to abate the local mischief by dividing the prepuce is most urgent. Both glans and prepuce are highly inflamed; the swollen glans stretches the foreskin, while the latter, thickened and indurated by inflammation, acts like a bandage on the inflamed glans. If effectual relief is not afforded by incision, the distended prepuce suppurates and sloughs on its convexity, forming a ragged hole, through which the glans protrudes, with relief of the distress. The prepuce is to be divided with a curved bistoury, carried along a director, introduced from the orifice to the angle of reflexion. Copious bleeding usually follows, with great relief both of the part and the constitution. If, however, it should be excessive, which it seldom is, it must be stopped by the usual means. A soft bread poultice, with rest in bed, and an opiate if there is much pain, soon make the patient easy. The slough is soon detached, the inflammation of the glans and prepuce ceases, and a healthy granulation with good pus succeeds, forming a striking contrast to the previous condition. If the prepuce does not give way, the glans may mortify to a greater or less extent.

To determine whether the prepuce should be divided or not is sometimes a difficult point of diagnosis. The degree of redness, swelling, and pain will not enable us to decide. The propriety of the measure depends on the condition of the sore, which we cannot see. The discharge from the orifice of the prepuce must assist our judgment in doubtful cases. An ichorous or sanious state of discharge, with fœtor, indicates sloughing; and in such circumstances the division

ought to be performed. If the discharge should be purulent, even though somewhat bloody, and the glans not tender on pressure, we may be contented with leeches, tepid syringing, and mild aperients.

In cases of primary sloughing sore on the glans, its most frequent seat, I have found incision of the prepuce necessary, even where it has not been much swelled and enlarged, nor in the state of phymosis. It has always been most beneficial, not only as a measure of temporary relief, but in respect to the progress of the sore.

In some milder cases of primary sloughing affection which differ from those just described both in their origin and symptoms local and general, it may not be always necessary to divide the prepuce. Rest in the horizontal posture, soothing local means, such as fomentations and soft bread poultice, mild diet, with opiates if necessary, will be the sufficient and best means.

The objection to slitting up the prepuce, that the cut edges may become phagedenic or sloughing, is completely unfounded according to my experience, which has been somewhat extensive in this matter.

Phagedænic sore. If mercury really has the power of arresting syphilitic disease, it should be shown in the treatment of phagedæna, where destruction of parts is going on more or less rapidly. I have seen many cases in which the prepuce has been slowly eaten away, nearly to its attachment, by a process so little painful that the patient has hardly sought for a remedy. In all of them the regular and mild use of mercury, in the hospital, has soon stopped the progress of the disease and effected a sound cure. I have seen a case in which the entire prepuce has been destroyed in this way, the use of mercury having been absolutely forbidden. I have known of a similar result where the glans was the seat of the

disease. When the phagedænic sore is proceeding actively, destroying the affected parts by an ulcerative, not sloughing, process, without surrounding inflammation, or material constitutional disturbance, the active use of mercury, both locally and internally, is indicated. At an early period of my practice, when doubts and difficulties had been raised and uncertainty prevailed respecting mercury, I saw a seafaring man from Wapping with a large quickly spreading ulcer of the glans, eating deep, with foul phagedænic surface. It spread for three or four days under my fruitless efforts to do good by soothing treatment. At this time the patient was fortunately seen in consultation with me by the late Mr. Thomas Blizard, an adherent to the ancient faith of mercury, which he immediately pronounced to be the only remedy for saving the remainder of the glans; it was immediately resorted to internally, and by friction, with black wash to the part. The mouth was quickly and profusely affected, and rapid cicatrization ensued.

If there should be much pain, and if the constitution is depressed, opiates and sarsaparilla would be advantageous.

The lining of the prepuce is sometimes penetrated by phagedæna at the fold where it is reflected over the glans, and the ulceration then burrows between the penis and the sheath of integument reaching possibly to the pubes, and nearly insulating the body of the organ. This mischief can only be remedied by incision, so as to expose the morbid surface completely.

As the phagedænic and sloughing sores are allied forms of disease, the one passing by insensible gradations into the other, we may be at a loss to determine whether to administer mercury or to adopt a mild and soothing local treatment. When the sore presents a blackish, or dark-brown slough, it is a case for soothing local measures, perhaps with some direct antiphlo-

gistic treatment; if the surface be gray, white, or phagedænic, mercury may be advisable. In a doubtful case, if there is local inflammation, with febrile constitutional disturbance, try antiphlogistic means; if these fail, employ mercury decidedly; should that aggravate the symptoms, opium should be used internally and locally, with iodide of potassium and sarsaparilla.

In gonorrhœa præputii, if there is mere inflammation, with increased and altered secretion, and patchy excoriation, mercury is not necessary. The local affection is speedily removed by astringent lotions, such as a solution of Zinci Sulphas. Should there be actual ulceration, a mild use of mercury until the surface has healed will be the safest course.

In the remaining primary affections, namely, in the simple venereal sore without induration, in that on the body of the penis with slightly raised margin, and some thickening of the base, in superficial ulceration, and perhaps in mere excoriation, with subjacent thickening, and in indurated sore, not to mention modifications approaching more or less to these or combinations of different forms; that is in the great majority of primary sores, the sloughing and phagedænic being few in comparison, the most important question is as to the use of mercury.

The points we have to consider may be comprised under three questions. First, whether the use of mercury is essential to the cure of such sores; Secondly, whether its employment will abridge the duration of the complaint; in other words, whether it will expedite the cure; Thirdly, whether it will prevent the occurrence of secondary symptoms, or have any influence in protecting the patient from those subsequent diseases which constitute constitutional syphilis.

Now, that the employment of mercury is not essential to

the cure of these sores, I have already had occasion to explain, having shown that it has been proved by the clearest evidence that all forms of the venereal disease may get well without its use. An exception must be made to this statement in respect to phagedæna, both acute and chronic. The prepuce or the glans might be lost by withholding the use of mercury in these affections.

The next question is, whether it abridges the duration of the complaint; and on this point the evidence is contradictory. I know that it was the opinion of Mr. Rose, whose name I have mentioned as having commenced in this country those important investigations that have thrown so much light on the nature and treatment of the venereal disease, that, although primary sores can be cured without mercury, the cure occupies a longer time. Mr. Guthrie acknowledged that the primary venereal sores treated without mercury at the York Hospital, were tedious, frequently running on to six, eight, ten, and twenty, and even in one case to twenty-six weeks, healing and relapsing. He thought that the protracted cases would have got well in one half or one third of the time under mercury. Others have stated that the sores treated without mercury got well the soonest. I allude particularly to some comparative trials made in the English army. A report was made by Sir James M'Grigor, then Director-General of the Army Medical Board, and by Sir William Franklin, that, in 1940 cases of primary venereal sores, treated without mercury, in the course of two years, the average time required for the cure was twenty-one days when there were sores without bubo, and forty-five days when bubo co-existed with sores. During the same period 2827 cases of primary sores were treated with mercury, and they occupied, on an average, thirty-three days when without bubo, and fifty days when complicated with bubo. In a

number of cases that were treated at the Val de Grace, in Paris, a similar result was obtained; that is, out of 1084 cases of primary sores, 336 were treated with mercury; and the average duration of these cases was forty-seven days, without a distinction as to whether they had bubo or not; 698 cases were treated without mercury, and the average duration of these was twenty-eight days. According to these statements, then, the result is much in favour of the treatment without mercury. We do not, however, know whether the cases were taken indiscriminately, or selected for the two modes of treatment on account of difference in their nature and indications.

The third question is, whether the employment of mercury for the primary affection has any effect in preventing secondary disease? Mr. Hunter's statements on this point are contradictory. He probably had not instituted comparative trials himself, so that the opinion he has given on this point is rather theoretical than practical. The returns of numerous cases treated in the British army partly in one way, partly in the other, where the patients continued under observation for a considerable time, so as to afford an opportunity of knowing the result of the treatment of such cases, lead to the conclusion that the employment of mercury for the primary symptoms has a decided effect in preventing the occurrence of secondary affections. This is entirely a question of experience, only to be solved by observing the results of the two modes of treatment in a great number of cases. Mr. Rose states that, of the cases that he treated without mercury, about one in three had secondary symptoms. Similar observations were made at the same time in the York Hospital at Chelsea, in which the proportion of secondary symptoms was one in ten; but in subsequent and more enlarged army experience, the proportion of secondary

symptoms was not greater than one in twenty. In 1940 cases treated on the non-mercurial plan in the army, there were 96 instances of secondary symptoms, that is, about one in twenty, taking cases of all descriptions. In 2827 cases treated with mercury, there were only 51 instances of secondary symptoms; that is, one in 55; the clear inference being that the employment of mercury for primary sores has a marked influence in preventing the occurrence of secondary symptoms.

I cannot adduce any experience of my own that approaches in extent and accuracy to that just detailed. The result of my own observation is, that very few instances of secondary symptoms occur when these primary sores have been treated with mercury. I therefore adopt in the primary sores now under consideration a mild mercurial treatment, such as three or four grains of the gray powder three times a day, or four or five grains of blue pill twice or three times daily, with black wash to the part; a quiet mode of living, and light diet, without stimuli. Under this treatment the mouth is slightly touched. The local means may be varied if necessary by employing nitrate of silver or sulphate of copper in solution.

In the treatment of indurated chancres the use of mercury is considered more particularly necessary, and it is carried further than in other cases. It is equally required whether the induration existed originally, or has come on subsequently, also if it remains after the sore is healed. The patient cannot be considered safe so long as the hardness remains, and the remedy should therefore be continued until it is dispersed. This effect may be hastened by the application of mercurial ointment to the part. Cicatrization of the sore, and then absorption of the hardness, take place favorably under the use of mercury generally and locally.

A patient in St. Bartholomew's had a small and not deep

sore on the lining of the prepuce, equal in size to the last joint of the fore-finger, so that the prepuce could not be retracted without difficulty. The sore and induration, which had existed for two months, were cured in three weeks.

A gentleman had a reddish thickening and induration of the prepuce, forming a considerable elongated enlargement, which had existed nearly two years; it went away under the use of mercury employed for other symptoms.

A gentleman had two or three small sores, which healed in about three weeks under the moderate use of mercury. In three weeks more an induration came on at the base of the prepuce, without any fresh infection, and a sore formed upon it. The induration was as large as a horse-bean. The sore healed in a fortnight under mercurial treatment; the induration had nearly gone in six weeks more. This patient, with whom I was acquainted for many years, had no secondary symptoms.

A young medical friend had a large induration of the prepuce, with superficial ulceration. Slight use of mercury did no good, but the disease yielded quickly to a more free employment of the remedy. There were no secondary symptoms.

A gentleman had venereal sores, which were very obstinate. After they had been cured he married. In about a twelvemonth a large red thickening came in the prepuce, and a few scaly eruptions on the head. These symptoms disappeared under the use of mercury.

Bubo.—This word, which is the Latinised form of the Greek βουβων groin, means a swelling in that part of the body. It was originally applied to syphilitic enlargement of the absorbent glands in that region, but it is now sometimes, though not very correctly, used to denote such glandular affections consequent on primary venereal sores, wherever

they may be situated. The situation of bubo, therefore, will depend on that of the primary symptom; thus, in the great majority of cases, they occur in the glands situated nearest to the external organs of generation; in those of the groin, at the lower part of the abdomen, at the upper and inner part of the thigh, or at the pubes. They may occur in the axilla from primary sores on the fingers or hand, or on the nipple or areola of the female breast. Primary sores on the lips might give rise to glandular swellings below the lower jaw. The glands below and behind the angle of this bone are frequently enlarged in connection with syphilitic disease of the fauces. I have never seen them in this situation attaining considerable size, proceeding to suppuration, or causing trouble after the throat had got well. The disease may affect a single gland, or more than one, sometimes even including the whole range. An absorbent vessel is occasionally but rarely affected, and is felt as a small, rather painful cord on the back of the penis. It gives no trouble. The affection may be in the inguinal or in the femoral glands, or in both; in the latter case there is a double swelling, one above, the other below the bend of the thigh. It may be confined to one side, or exist on both; it may occupy both ranges of glands on both sides. It usually occurs on the same side of the body as the primary affection, but instances are not unfrequent in which it is seen on the opposite side. The disease may be simple enlargement, enlargement with induration, or inflammation more or less active in the two former cases. The swelling is moveable under the skin, and may continue so throughout, the disease not being active, and confined to the gland itself. The inflammation may increase and spread to the surrounding cellular tissue, with interstitial effusion, and consequent thickening, by which the separate glands are massed together

into an uniform, oblong enlargement, which becomes fixed to the subjacent parts, and to the skin in front. The progress of the inflammation brings on increase of swelling with redness, heat, pain, and constitutional disturbance. Suppuration frequently ensues, the matter being usually formed in the cellular texture round the gland, not in the substance of the latter. It may, however, occur in the gland, or in both situations at once. When a suppurated bubo has been opened by a free incision, the retraction of the edges sometimes exposes the glands as if they had been dissected. When the case is proceeding favorably, they soon granulate like the rest of the surface. The discharge of the matter, whether by natural opening or puncture, is sometimes followed by ulceration, which may be extensive, intractable and tedious, especially in individuals of naturally weak constitution. In some unfortunate instances extensive sloughing has supervened, either from the noxious influence of a bad atmosphere in a crowded and close apartment, or from injudicious treatment, with neglect and irregularities on the part of the patient.

Buboes sometimes occur quickly after primary sores, especially such as are attended with much irritation. Sometimes they do not arise till days or weeks have elapsed, the sore being nearly, or even completely healed. In the latter case they have been regarded as constitutional symptoms, though further information would be necessary to establish that view. They accompany gonorrhœa as well as syphilis. They occur occasionally, but rarely, without any previous primary affection, and have received from the French the name of "bubons d'emblée," which might be translated into English as arising originally or at once. They might be called primary.

The bubo, being in the great majority of instances attended

with a primary sore, participates in the treatment adopted for the latter, whether simply antiphlogistic or mercurial; and the swelling is dispersed without any means being especially directed to it, in ordinary cases, when properly treated from an early period of the affection. When a sore requiring the use of mercury is accompanied by buboes, mercurial frictions are recommended, on the supposition that the local influence of the remedy on the glands through which it passes, will promote their cure. Mr. Hunter seems to have relied on this as an invariable effect; and it certainly happens often, but by no means uniformly. When the sore has healed, it is not necessary to persevere with mercury; especially when the bubo, after having suppurated and discharged externally, is healing kindly.

When buboes occur without primary sores, are they to be regarded as a venereal symptom? Ought mercury to be used?

I have seen so many instances of glandular swellings, without primary ulceration, occupying both groins in individuals otherwise healthy, after exposure to infection, that I am satisfied venereal poison may affect the glands without causing any other primary symptom, either as ulceration or discharge. Such swellings, when left to themselves, may remain a long time without any change. I do not know whether they can give rise to secondary symptoms. They should be treated with mercury; and they are decidedly benefited by mercurial frictions and plasters. Mr. Carmichael, however, says, "If the tumour in the groin has not been preceded by an ulcer on the genitals, mercury is unnecessary, and may be highly injurious." ('Venereal Diseases,' p. 310.) I cannot understand on what ground this positive statement rests, assuming, as it does, the denial of venereal character to the glandular affections in question. Do we know how primary sores are produced? A poisonous matter is applied

to a healthy surface, on which, without any change appreciable by our senses having occurred in the intermediate time, a sore comes after several days, or possibly some weeks. Some impression must have been made on the part at the time, and why may not that impression, whatever it may be, lead to a syphilitic bubo, as well as to a primary syphilitic ulcer? It is a question of experience to be settled by facts, not by bare assertion, however positive.

Common principles of treatment are applicable to syphilitic inflammation of the absorbent glands, viz., local bleeding, which is not often required, cold lotions, poultices, light diet, and rest in the recumbent position; the latter is of importance by allaying the local inflammation, and thus preventing the occurrence of suppuration or lessening its amount.

If suppuration has already occurred, the matter will sometimes, but not frequently, be removed by absorption, the swelling disappearing without any external discharge. If the suppuration, when of moderate extent, is coming favorably to the surface, it may be allowed to discharge naturally. Should the quantity of matter be more considerable, with the skin reddened and raised, it must be discharged by a surgical opening. This should be made, not in the long axis of the swelling, but in the vertical direction, through the whole breadth, from above downwards, in order to give the most favorable drainage for the matter, and to prevent its detention by the thinned skin. If the integument has been much thinned and detached, it may be rubbed with the potassa fusa on its most prominent part to the extent of half or three quarters of an inch, the eschar being cut through on the following day; it is advantageous to destroy some of the thinned skin in this way. If the granulating process should still be languid and tardy, the red precipitate ointment, the nitrate of silver, or sulphate of copper, with compression and

bandage, may be resorted to. In order to abridge as much as possible the amount of inconvenience and confinement occasionally incidental to a suppurated bubo, it has been recommended to make an early opening with a very narrow knife, and to press out the matter gently, to close the opening with a small bit of plaster, and cover the part with water dressing, the patient remaining at rest for a day or more. A small suppuration occurring in an indolent bubo, which does not interfere with the occupations of the patient, may be left to break of itself, and will require nothing more than a bit of plaster over the opening until it closes. In a large, glandular swelling, there may be repeated suppurations, resulting in fistulous openings, which may require to be injected with astringent solutions, or to be laid open with subsequent pressure by bandage.

Large, indolent buboes, with or without sinuses and fistulous openings, may be treated with blisters, which sometimes lead to their dispersion, sometimes to more active inflammation and suppuration; they may also be painted over with a solution of nitrate of silver, in the proportion of a scruple to a dram of water. This solution may be used with advantage in other states of buboes, and is often successful in preventing the occurrence of suppuration.

Unhealthy and extensive ulceration, which not uncommonly supervenes in scrofulous subjects, with foul surface, livid, raised, and irregular margin, is best remedied by pure air, especially that of the sea side, with good diet, including stimuli, sarsaparilla, and tonics. Sloughing bubo imperatively requires removal from a noxious to a pure atmosphere, the general treatment just mentioned, and such local means as charcoal or yeast poultices, and balsam of Peru; if the strong nitric acid should be thought advisable, it must be used most cautiously in the neighbourhood of the great vessels.

SECONDARY OR CONSTITUTIONAL SYMPTOMS (LUES VENEREA).

A portion of time more or less considerable generally elapses between the cessation of the primary and the appearance of secondary symptoms. The usual interval is from six to twelve weeks. Sometimes the secondary symptoms come on earlier, even before the primary have disappeared. It is not uncommon to see patients who have neglected all treatment and led an irregular life with primary sores and incipient syphilitic eruption. I once saw a young woman of sanguine temperament with primary sores, buboes, eruptions, sore throat, iritis, and swellings of the periosteum. In other instances, the appearance of secondary disease is delayed much beyond the time mentioned; to many months, or even longer. In the same way there may be long intervals between the successive secondary symptoms, resulting from one infection. In one instance fourteen months had elapsed between the primary sore and a scaly syphilitic eruption; the patient had forgotten the sore, and did not remember it till questioned on the point. In another case there were nearly two years between a primary sore and a scaly eruption resulting from it. A gentleman was under my care for primary sores, followed by sore throat and eruption. He got well, and married at the end of a year from his recovery. In three years after his marriage he consulted me with symptoms of decided syphilitic character, a few scaly patches, two or three small circular sores on the legs, and one similar sore on the scapula. These gave way readily to mercury.

In two instances of ulcerated sore throat, which I could not hesitate to regard as syphilitic, there had been intervals of eight and ten years without any symptoms.

These, and many other analogous instances, must convince

us that in respect of the time which may elapse between primary and secondary syphilis, and between the successive manifestations of the latter, there is great latitude. I feel unable to point out a limit, that is to say, what is the greatest extent of possible interval; or what length of time may be considered as affording perfect security against the recurrence of disease. Some surgeons would, I believe, question the nature of the disease in many of these cases. They would deny that an affection could be syphilitic when the patient had been free from all symptoms for many months or several years. I think there are no good grounds for such denials. If several months may elapse between primary and secondary symptoms, or between successive attacks of the latter, we can have no difficulty in admitting that the time may be extended to one or two years; and we really see cases where the point is clear. If one or two years, why not four or five, or more? It is a mere question of experience. Observe, however, that the statement now made applies to cases which are altogether exceptional. In the ordinary course, if a patient remains well for twelve months after the healing of a primary sore, the chances of secondary mischief are so small that they may be put out of consideration in practice. The chances are rather less favorable to the patient when secondary symptoms have already occurred.

The appearance of constitutional symptoms is frequently preceded and accompanied by feverish disturbance more or less considerable, by heat, thirst, loss of appetite, headache. There may be pain in the limbs and chest, cough, accelerated pulse, shivering. The fever is analogous to that which precedes the eruption in the exanthemata.

Syphilitic affections of the skin.—1. Simple erythema; mere redness, without any other change, not in general

very vivid, in nearly circular patches about the size of a shilling, generally on the trunk, sometimes so numerous as to give the surface a mottled or marbled appearance. They go off without leaving any trace behind.

2. Scaly syphilitic eruption ; *psoriasis syphilitica* consists of red spots of various size, from that of a split pea to a shilling. These are of a brownish or coppery red, without elevation, and heretofore called copper-coloured blotches. The red colour becomes more vivid, and the cuticle assumes a rough and more or less scaly state. The spots sometimes run together into larger patches ; they are commonly bright and large on the forehead and face. They come on the scalp, and make the hair fall off. They spare no part, not even the palms or soles ; here they are very characteristic, the thick cuticle dries, cracks, forms white or horny scales. I have sometimes seen the affection confined to the palms and soles.

3. *Tubercular eruption*, in reddish or brownish-red elevations of various sizes, generally scattered, sometimes in groups, with the surface smooth at first, and then becoming slightly scaly. They are largest on the face, as big as peas, sometimes larger, and do not occur on the palms and soles. They leave a brown or livid stain in the skin after they are gone. Reddish or brownish marks often remain long after recovery.

4. *Papular* (*Lichen syphiliticus*) is an active inflammation in the form of pimples, scattered or in clusters, on the face, trunk, and limbs ; sometimes so numerous on the trunk that a portion of skin free from the affection can hardly be seen. Very small vesicles or pustules form on some of the pimples, and soon dry up. The eruption abates in two or three weeks, and disappears by resolution, leaving stains, which do not last long. There are often successive crops. This eruption, which is an active inflammation, extending over the

greater part of the body, is preceded by feverish disturbance, often very considerable, which declines in proportion as the affection of the skin is developed.

5. *Pustular* (*Ecthyma syphiliticum*), consists of pustules, varying in size, formed on inflamed and indurated bases. They are generally separate, scattered irregularly on the trunk and limbs, and not numerous. Sometimes there are groups of small pustules on inflamed patches of skin, as in the case of impetigo. Sometimes they approach in size to the papulæ, and thus form a transition from the papular to the pustular form; some of these, indeed, are often intermixed in the papular eruption. Occasionally the pustules are of considerable size. The cuticle soon gives way, and thin, yellowish, or brownish scabs form, which soon fall off, leaving a reddish mark.

6. *Vesicular; Rupia.* On an inflamed elevation of the skin the cuticle is raised, not by pus, but by a thin, slightly opaque fluid, which escapes and forms a thin, dark, adherent crust. Under this ulceration takes place, and extending equally in all points of the circumference, forms a circular sore. When it has attained some size, about that of a shilling, the ulcer begins to heal at some one part, while it spreads in other directions. The healing may begin in the centre, while ulceration goes on in the whole circumference, so that the sore retains the circular form, and is annular; or it may heal at one part of the edge, and from that towards the centre, and spread at the rest, so as to have a crescent shape. The spreading edges of these sores are phagedænic, and retain that character so long as they increase in extent. The surrounding skin is bright red, the edge ragged and sharp, while the surface immediately within this edge is a grayish or yellowish disorganized substance, in short, a kind of slough, which, though of softish appearance, is not deficient in

firmness. The ulcer, which is very painful, extends by a succession of these sloughs, while granulation and cicatrization are going on in the opposite direction of the same sore. In neglected cases these sores are seen under various modifications of size, form, and degree of sloughing, sometimes with elevation of the spreading margin. When these syphilitic ulcerations are left uncovered, the discharge concretes into dark, brownish, or blackish flat scabs. If the ulcer is spreading rapidly, these crusts will assume a prominent, conical shape, not much unlike that of the limpet shell. The scab increases by successive additions at its base, which push up the portions previously deposited; it thus resembles a number of concentric rings, placed one over the other, the largest at bottom, the smallest at top. These sores sometimes exist in great number, occurring in various parts of the body, creating much suffering and constitutional disturbance from their painful character. The affection, including the vesicle or pustule with which it begins, which has usually broken before we have the opportunity of seeing, and the scabbed sores which follow, constitute *Rupia simplex*, or *L. prominens*, according as the scab is flat or conical. It is well figured by Bateman in his 'Delineations of Cutaneous Diseases,' plates 53 and 54.

These eruptions are most commonly distinct, but not always so; they are sometimes of mixed character. The tubercular and the scaly are frequently combined. Pustules may coexist with scaly eruption, and thus we see ulcerations conjoined with the coppery patches. In papular eruption some of the pimples, as might be expected, often become pustular.

Other syphilitic affections of the skin.—Besides the eruptions now described, there are ulcerations of the skin, more or less important, of not infrequent occurrence in secondary

syphilis. A portion, sometimes circular, sometimes of irregular figure, slowly inflames, becomes red, thickened, indurated and irregular on the surface. Ulceration ensues, usually going deeply, with foul surface. There may be a large slough, or some smaller ones, leaving foul sores. Occasionally a circular piece of skin is destroyed in its whole thickness, leaving a deep ulcer, as if a piece had been taken out by a punch. When the ulcers have healed, the skin remains rough, red, and sometimes tuberculated; occasionally ulcerating, if neglected, and possibly lasting a considerable time. The larger excavated sores remaining after a deep slough are extremely painful in the whole course of the complaint, and demand careful treatment both local and general.

The term *rhagades*, a Greek word, meaning chaps or fissures, is applied to a superficial inflammation of the thin integument around the anus, with excoriation or ulceration of its slight, radiated folds, and thin discharge from the surface. The orifice of the bowel may be free in the *rhagades ani*, or it may present an ulcerated fissure. It may be attended with considerable uneasiness, especially in sitting, and patients often refer their suffering to piles.

The old name of *rhagades digitorum* is applied to a peculiar and painful ulceration of the toes, affecting their intervals and opposed surfaces, of which the cuticle becomes thickened and opaque, while the cutis is partially livid, yielding a thin, brownish, and very offensive discharge. It may affect one or two intervals or the whole series. In the worst cases the ulceration occupies the entire palmar aspect of all the toes, and extends to the prominent margin of the sole immediately behind them, the surface, which is that of denuded cutis, being smooth, of irritable appearance, and yielding, not pus, but a light, yellowish and clear exudation.

With this affection, or independently of it, we may meet

with an inflammation and foul ulceration at the root of the nail, of the great toe more particularly, sometimes called onychia maligna, probably from the high inflammation, the pain, offensive discharge, and intractable nature of the disease. It may also be seen in a less troublesome form in one or two of the smaller toes. The rhagades may occur alone or in conjunction with other symptoms, more particularly scaly eruption.

I have seen the nail of the forefinger completely loosened by an ulcerative process, so that I was able to separate it without pain from its cuticular connections. The exposed vascular surface was in a discharging state, and soon healed under simple applications. The patient, a female, had other symptoms of syphilis.

A gentleman consulted me on account of disease in the nails of both hands, all of which were affected more or less. The nails were separated from the subjacent parts at their loose edge, the attached base being in its natural state. The affected portions had a light-brownish appearance, the ends of the fingers being somewhat reddened, warm and tender, particularly on exertion. The separated portions of the nails were dry and fissured. Although this was such a case as I had not seen before, the suspicion of syphilis crossed my mind, and I inquired whether there were or had been any other symptoms, to which he immediately gave a negative reply. Not feeling quite satisfied, I asked if he had anything of eruption; he said not, but on further urging the question, he said there might be something very slight on the arms. When they were uncovered several spots were found on them, sufficiently characteristic of syphilitic origin, which he referred to a complaint contracted many years before, previously to his marriage. I prescribed mercury and warm bath, under which the heat and tenderness ceased, and the

progress of the mischief was arrested. He was going on most favorably, when he grew tired of the treatment, and left it off. All the symptoms returned in a short time, and he was obliged to go through a regular mercurial course, so as to affect the mouth, with the result of a complete and permanent cure.

Mucous tubercles, condylomata, warts. — The discharges incidental to venereal affections irritate the skin covering the sexual organs and the immediately surrounding parts, and produce various superficial and chiefly temporary affections, not in their nature venereal, though that disease is their occasional cause. Mucous tubercles are almost, but not entirely, confined to females, in whom the configuration of the genital organs almost necessarily exposes them to the irritation of discharges, especially under neglect of cleanliness, and indulgence in irregularities of all kinds. Mucous tubercles are vascular elevations of the cutaneous texture, generally circular and of regular convexity, varying from the size of a split pea to that of a shilling or half-crown; the surface is irregular, somewhat fissured and ulcerated, and pours out a thin mucopurulent discharge. When properly treated, the discharge stops, the surface becomes dry and cuticular, and the elevation soon disappears. In fattish women, of flabby fibre and thin skin, these tubercles spring up rapidly, and soon cover the external organs and adjacent parts, from which they extend sometimes wherever there are cutaneous folds or two surfaces in contact; thus, they may be seen in the axillæ, under the breasts when pendant, at the bend of the thigh, and the navel. Large growths of this kind, of irregular figure, are called condylomata. The external organs of women, the glans and preputial lining of men, often become covered with vascular warts, either of pedunculated character or with broad bases; under neglect they may increase, so as

to form large masses. A vascular elevation of warty kind is sometimes seen on the raphe of the perinæum, and has been called, not inaptly, crista galli.

The immense magnitude which these masses are capable of acquiring could hardly be believed without the direct evidence of sight. The most extraordinary case I have seen was that of a female under twenty-five years of age, who had led an irregular life, but had suffered only from gonorrhœa; she had been married about a year, and was pregnant when admitted into St. Bartholomew's under my care, in a good state of general health. Each labium, hypertrophied and beset with large, warty excrescences, was at least as large as my fist. The interval between them was occupied by a third mass of nearly equal size, consisting of the clitoris and nymphæ, in a state of morbid change, similar to that of the labia. Behind these swellings were smaller, but by no means inconsiderable, masses of vascular excrescence, extending along the perinæum and verge of the anus, completely hiding the entrance both of the vagina and rectum. The extensive surfaces of these growths was moistened by a copious discharge of offensive character. The écraseur was employed almost entirely in removing these strange growths, and accomplished the purpose satisfactorily and safely, especially in preventing loss of blood, and with less suffering altogether than might have been expected, considering the bulk of what was removed, and that five or six repetitions of the operative proceedings were required. On the first occasion an instrument was employed to each labium at the same time. Both chains, although of the strongest construction, broke, and it became necessary to finish the separation with the knife, which was accomplished almost without bleeding. The middle tumour was removed in the same manner on another day, and the largest of the posterior masses were taken away on subse-

quent occasions. These operations and the use of chloroform were not attended either with dangerous or even unpleasant symptoms. I doubt whether this disease could have been removed without the aid of the écraseur; the use of the knife would have been attended with dangerous bleeding, and must have been repeated at least three or four times, if not more. The structure of the parts removed, differed only in size from the ordinary vascular excrescences of this region.

Iritis.—An inflammation of the eye, beginning in and confined to the iris under favorable circumstances of treatment and duration, otherwise extending to the important structures behind, occurs not unfrequently in conjunction with syphilitic eruptions, particularly the scaly, papular, and tubercular. It may occur at a later period than that of the eruption, and is sometimes, but rarely, seen as a sole secondary symptom. It may affect both eyes simultaneously, or in succession. The characteristic appearances of the affection are caused by effusion of fibrine into the texture of the membrane, on its surface, and on the pupillary margin. The iris loses its brilliancy, and the delicate fibrous character of its surface, becoming at first sluggish, and then motionless, the pupil contracts, and soon adheres to the crystalline capsule. Its colour is altered; if blue or gray, it presents a dull, yellowish, or greenish discoloration, the general tint being darker than before; if brown, it turns to a dull red. Fibrine is often effused, in small, reddish, or brownish tubercles, on the pupillary margin or the surface of the iris. The sclerotic vessels are congested, and as they approach the front break up into an infinite number of minute ramifications, closely crowded together, and forming a red zone round the cornea. This zone is at first pink, the distended vessels being seen through the conjunctiva, which is unaltered; as the affection proceeds, the mucous membrane partakes of the inflammatory

disturbance, and the zone is then bright red. The cornea, at first clear, gradually becomes dull and hazy, especially if the inflammation is violent and continued. In an acute attack there may be severe pain in the globe and head; but in a milder degree, which is the most common, there is little or no pain during the day, while it comes on at night, interfering with and often preventing rest. Vision is dull at the beginning, becoming more and more imperfect, until in severe cases it is lost for the time. Some intolerance of light with lacrymation is experienced at first, but soon goes off. The disease begins on the pupillary margin, occupies the inner circle of the iris, on which a stratum of reddish-brown fibrine is sometimes poured out; it extends more or less rapidly to the circumference, and then through the ciliary body to the posterior tissues. To this extension, which renders the disease of the organ more general than the term iritis indicates, the impaired vision must be referred. When in a mild form, the complaint may go through its course and recover, with slight change in the pupil, not injurious to vision. It may cause contraction of the pupil and its closure by an adventitious membrane, and more or less disorganization of the iris, with complete loss of sight. In rare instances lymph is effused behind the iris, and in such quantity as to cause a bulging of the sclerotic and conjunctiva. The fibrine thus effused may pass through the pupil into the anterior chamber. In the few instances which I have seen of this affection vision has been completely lost, although the inflammation has yielded to treatment.

Syphilitic affections of the throat, mouth, and tongue.— There is an excavated ulcer of the tonsil, generally on both sides, as if a portion had been scooped out; the surface is grayish or dirty white, sometimes termed lardaceous. The inflammatory symptoms are slight, merely a little redness, with-

out swelling or pain. I have found it in patients who had said, when asked on the subject, that they had no sore throat.

There may be inflammation of the mucous membrane of the fauces, with redness, thickening, and pain, especially in swallowing. There may be ulceration in various forms, superficial or a little deeper, with slight loss of substance, yellowish or whitish surface, frequently with painful enlargement of the cervical glands. These appearances are seen on the tonsils, velum, and uvula. There may be a superficial ulceration, with white surface, as if the part were covered with milk; this has been called the snail track ulceration.

Phagedænic ulceration of the throat is a most painful and formidable affection, beginning at the back of the pharynx, and extending forward to the tonsils, velum, and uvula. It has an irregular, foul, tawny, grayish, or yellowish surface, with a ragged edge, red and swelled margin. It often spreads to a great size, passing upwards, behind the velum, and downwards further than we can follow it. Sometimes it passes to the upper surface of the velum. There is severe pain, shooting to the ears, and thus showing that the expanded orifices of the Eustachian tubes are involved in the mischief. Deglutition is only accomplished with the greatest difficulty and suffering, and even articulation is painful. When the upper surface of the velum and the pharynx suffer together, the surfaces become firmly and permanently united by inosculation of the granulations. A small opening at the centre keeps up the communication between the posterior, nares and the pharynx.

Syphilitic affection of the tongue is of frequent occurrence, either in conjunction with disease in the throat or independently. The mucous membrane, with its epithelial covering, is the part affected in the great majority of instances. In conjunction with scaly eruption, the membrane may be

denuded in small patches towards the middle of the dorsum, with little inconvenience. It might be considered as an appearance of the eruption under a modification dependent on the difference of structure in the surface. We sometimes see a thickening of the mucous membrane, which is slightly raised in a nearly circular form on the middle and back part of the dorsum, with slight fissures, giving it something of a warty character; it is attended with some pain. There may be reddish swelling of the edges of the tongue, of fissured and warty appearance, and very painful; or spongy swelling of the edges, with superficial ulceration, similar to that caused by mercury. Superficial or excavated ulcers occur on the edges or tip, less frequently on the dorsum; there may be a single ulcer, with indurated base.

Ulcerated fissures of the tongue.—I was consulted by a patient with a painful swelling at the middle of the dorsum, on its left side. It was red, painful, and occupied by two ulcerated fissures, from half to three quarters of an inch deep, parallel to the long axis of the organ. The swelled part was firm, but not of scirrhous hardness. There was a small, glandular swelling near the ramus of the lower jaw. In three or four days a sore on the head was accidentally discovered; it was a large, irregular cicatrix of the scalp, towards the circumference of which three or four small, circular, and tolerably healthy ulcerations existed; a superficial ulceration was also discovered in the throat. The patient now stated that he had contracted the venereal disease seven years previously, and had nothing of the kind since, and that the sore on the head had been of eighteen months' duration. The use of calomel and opium, twice a day, soon affected the mouth; the tongue and the scalp got well rapidly, the cicatrix of the tongue presenting a superficial, longitudinal fissure.

A gentleman, twenty-four years of age, consulted me for a

deep, ulcerated fissure on the right side of the back of the tongue, parallel and near to the mesial line, and so far back that it could not be seen till the organ was drawn forwards. It was an inch long, of uncertain depth, but not less than three quarters of an inch. There was no induration of margin or basis, and it had existed a fortnight. There were small superficial ulcerations of the tonsils. The patient, then in perfect health, had had gonorrhœa a year before, and syphilis five years previously. He had experienced excoriations since, but never eruptions or sore throat. The mouth was soon affected by calomel and opium, twice a day, which he left off in ten days, considering the tongue quite well. He was recommended to persevere gently for a few days, as the fissure was not quite closed.

I have seen partial swelling and induration of the tongue from syphilis, and one case came under my care in which the entire organ was similarly affected, without much pain, but with the greatest inconvenience in mastication, swallowing, and articulation. I ordered the gray powder internally, which disagreed with the bowels, as it had done several years previously, when taken in a serious attack of primary syphilis. Frictions, which were substituted, agreed perfectly, with the effect of removing the disease slowly, but completely and permanently.

Ulcerated fissures at the angles of the mouth afford characteristic and unmistakeable evidence of syphilis, and did not escape the notice of Hogarth. The mucous membrane of the lips or cheeks may be thickened, raised, and simply excoriated, or superficially ulcerated, sometimes with aphthous whiteness. There may be superficial sores of circular figure, yellowish or whitish, without thickening. Superficial ulceration may occur on the hard or soft palate. Partial but active inflammation of the gums, with ulceration round the

necks of the teeth, of grayish phagedænic character, with great pain, is occasionally seen.

Syphilitic disease of bones and joints.—We give the name of node (Latin, *nodus,* a knot or knob) to a partial enlargement of a bone, which may be a disease of the bony substance or of the periosteum, the cases being, therefore, distinguished as osseous and periosteal. In the former case the swelling is of incompressible hardness, while the latter, although firm to the feel, yields a little to pressure. On a long bone, such as the tibia, it will be about two or three inches in length, but it may be longer; there may be more than one, and nearly the whole shaft is sometimes occupied by an irregular enlargement. The progress of the disease is slow, attended with aching pain during its development, after which there may not be much suffering while the patient is at rest in the day, but it becomes extremely painful in bed, so as to prevent rest, the pain going off in the morning. It is most frequent in the bones which, being thinly covered, are the most exposed to external influences. This is particularly observable in the tibia and cranium, also in the clavicle. The lower end of the radius and the upper portion of the ulna suffer not infrequently, and other bones may be affected in rare instances. Cranial nodes are generally, but not invariably, attended with suppuration, and thus are soft to the feel; active inflammation and suppuration may occur in those on the tibia, and partial necrosis of the bone or caries may ensue. This result is sometimes seen in the cranium. The swelling of the periosteum subsides under proper treatment; the bony node becomes quiet, but the enlargement generally remains in a greater or less degree. The shaft of the bone is sometimes the seat of pain, even in a severe degree, without any enlargement.

I have heard the opinion expressed, and seen it stated in

print, that the diseases of the osseous system now under consideration arise, not from syphilis, but from the use of mercury. These affections appear to me to result as unequivocally from the syphilitic poison as sore throat, eruptions, iritis, or any other among the universally recognised symptoms of the disease. They are to be met with frequently where no mercury has been taken previously, and they are seen as frequently yielding, with other concomitant symptoms, to an employment of the remedy which has had no prejudicial influence on the constitution. I have never seen them arise from the most free use of mercury, when employed in other cases, while, on the other hand, it may be used with advantage in periosteal affections not connected with syphilis.

Joints.—These may be placed in the following order, so far as relates to the frequency of affection, namely, knee, ankle, foot, hand, elbow, hip, shoulder. In the knee there may be inflammation of the synovial membrane, with effusion or general swelling, without recognisable effusion. In the foot and hand there is swelling, apparently affecting the periosteum of the metatarsal and metacarpal bones. These affections of joints are most frequent as secondary affections of phagedænic syphilis. They are likely to occur with severity in constitutions injured by the long prevalence of disease and repeated use of mercury. Like the bones, the joints may be the seat of pain, without the presence of actual disease.

Nose.—Its mucous lining may be affected with ulceration of active and painful, but more frequently of chronic character. The discharge of such ulcers dries into scabs, which may obstruct the passage of air in breathing, and are sometimes not forced out without pain and difficulty; they may be streaked with blood, and are apt to be offensive. The ulceration often attacks the septum of the nostrils, which it

perforates and may destroy to a considerable extent, making a free communication between the two sides, not visible externally, as the columna nasi remains entire. A more formidable affection of this part is necrosis of the bony structures, with active and painful inflammation of the membranous coverings. Portions of bone are lost successively in the progress of the disease. If the septum and ossa nasi go, flattening of the bridge is inevitable, with irremediable deformity, especially if it should be accompanied with phagedænic ulceration of the external nose. If a piece of the bony palate should be lost, an opening of communication between the nose and mouth is likely to be established, through which liquids pass into the nose in drinking.

The *testicle* does not suffer frequently in syphilis. The most frequent form of the affection is chronic inflammation, with moderate enlargement, firmness, but not induration, and not much pain. It is generally a remote effect, but it may occur earlier, with more active inflammation and pain. Both testicles may suffer together, but more commonly the complaint is confined to one.

A youth of twenty had a primary sore and bubo, which suppurated. The right testicle inflamed, swelled, and became painful, the scrotum reddening and beginning to adhere to the swelling, which was not large. Mercurial frictions were employed, nothing being done to the testicle except keeping it suspended. As the mouth became affected the swelling of the testicle lessened, and soon went away entirely; the scrotum loosened, and the parts completely regained their normal state.

A gentleman was under my care with numerous rupial sores, disease of the nose and of the testicle, sixteen months after small primary sores on the prepuce, which had been followed by ulcerated throat. It was represented that the

testicle had been swelled and then got better a few months previously. When I saw him the tumour was large, slightly red, and painful on pressure; there was fluid in the tunica vaginalis, which it was subsequently necessary to evacuate by puncture; it did not reaccumulate. Blue pill was administered carefully, being sometimes discontinued. The swelling of the testicle gave way very slowly, and had not entirely disappeared till after several months.

In another gentleman primary sores, regarded as pseudo-syphilis, had been treated without mercury, and speedily followed by an eruption for which a regular mercurial course had been instituted. This was soon followed by a second eruption and severe iritis. Another attack of iritis and five of sore throat occurred subsequently, and, lastly, soft periosteal swellings of the frontal bone and over the ossa nasi. I saw this gentleman for the latter affection four years after the primary sore. There was now, in addition to the other symptoms, induration, with slight pain, of one testicle, which was about half as large again as the other; this was what remained of a considerable enlargement and induration which had occurred during the foregoing disease, and had been treated by leeches, followed by mercurial ointment on flannel to the testicles.

The ear.—The meatus auditorius externus is sometimes inflamed with puriform discharge, considerable pain, and imperfection of hearing. The affection, which is of rare occurrence, and usually accompanied by other symptoms, has always yielded completely to the employment of mercury.

The larynx may be affected with inflammation and ulceration, extending into the glottis from the throat; it is a case of urgent danger, only to be averted by rapid mercurialization. Mr. Carmichael says that he never witnessed a recovery when the larynx was decidedly attacked by ulceration. Chronic

laryngitis may originate from syphilis, and require the operation of laryngotomy.

The several symptoms now detailed, which make up the constitutional form of lues venerea, neither occur indiscriminately nor in any regular and invariable sequence. Some are usually met with earlier and others later, but there is considerable variety in this respect, and in protracted cases the early symptoms, such as eruptions and sore throat, often reappear in an advanced period of the disease. Mr. Hunter distinguishes a first and second order of parts in constitutional syphilis, acknowledging that the order is inverted in some cases. Under the first he includes the skin, tonsils, nose, throat, inside of the mouth, and sometimes the tongue; under the second the periosteum, fasciæ, and bones.

Some modern writers call these respectively secondary and tertiary; there is, however, no regularity in this point, the order, as Mr. Hunter has observed, being sometimes inverted, while secondary and tertiary symptoms occur together not infrequently. Nodes and affection of the testicle, though usually late, may occur early, the former particularly. Affections of the throat and skin, which are commonly the first constitutional symptoms, occur frequently in the advanced stage of the complaint.

The nose, which Mr. Hunter has placed in the first order of parts, seldom suffers until a comparatively late period. The diseases of this organ, of the ear, the testicle, the larynx, and the joints, are certainly of late occurrence with few exceptions, and deep ulcers of the skin may be added to the list. Two, three, or more secondary symptoms are generally seen together, but I have met with sore throat, nodes, and iritis, as single and sole evidences of constitutional affection.

Mr. Carmichael has attempted to show that certain secondary symptoms can be traced to particular sores as

their source, and that these symptoms are developed in a regular succession, so as to admit of establishing four kinds of syphilis, so different from each other as to lead to the inference that they owe their origin to distinct poisons. Although he is far from having succeeded in this attempt, he has pointed out certain combinations and successions of morbid appearances which are not unfrequently met with in practice, and has distinguished them by appropriate names. He has acted judiciously in taking his names from the eruptions which are the most constant and characteristic symptoms. Looking to the indurated sore or chancre described by Mr. Hunter, he assumes that as the type of syphilis, and finds it commonly followed by the copper-coloured, scaly eruption, by the excavated and tawny ulcer of the tonsils, by pains in the shafts of the long bones, and nodes formed on their surface. He calls this the *scaly venereal disease,* which especially requires the use of mercury, both in its primary and secondary form. The second form is named, from its eruption, *papular venereal disease;* the eruption, which is papular, is accompanied by inflammation of the mucous membrane of the throat, with superficial ulceration, by severe pain in the joints and limbs, without swelling of the periosteum or bones, and by pains in the chest and back. The primary affections are gonorrhœa, excoriation of the glans and prepuce, and superficial ulceration, unattended with indurated base or elevated edge. There is active inflammation of the skin, with constitutional disturbance of corresponding character. Ordinary antiphlogistic means are proper in the outset, mercury being reserved for the decline of the complaint.

A third, well-marked form of the disease is the *phagedænic,* the primary affection being a phagedænic sore, which is followed by phagedænic sore throat, rupial eruptions, troublesome

and obstinate affections of bones and joints. Great pain attends in all stages of the complaint. There is tendency to relapse, and thus the strength and health of the patient are seriously impaired. Mr. Carmichael absolutely prohibits the use of mercury in all stages and forms of phagedænic disease, in which I cannot agree with him, although much harm may have been done by long and repeated courses of the remedy, which must have increased the prejudice against it. A fourth form has been mentioned, under the name of *pustular*, of which Mr. Carmichael does not speak with confidence.

Although surgeons who have seen much of syphilitic disease cannot fail to have observed occasionally the groups of secondary symptoms pointed out by Mr. Carmichael, and their succession to primary affections, there is by no means such regularity and constancy in either point as would justify us in adopting his conclusions. We sometimes see different primary symptoms, such as an indurated and a simple sore, coexisting in the same individual, also sores of different character derived from the same source of infection; and again formidable secondary symptoms derived from slight primary sores, and *vice versâ*, and irregular combinations of secondary symptoms. Many of these occurrences probably depend more on differences of constitution or temperament, on state of health, habits of living, and treatment in those who receive the disease, than in the nature of the poison, as I have observed on a former occasion in speaking of the latter subject.

Treatment of secondary syphilis.—A mild course of mercury, steadily pursued under proper precautions, is the best and safest mode of proceeding. It should not be begun until the constitutional disturbance which sometimes ushers in the attack and is often severe in the papular eruption, has been allayed. When ulcers of the throat or mouth are in an in-

dolent state, they may be touched with the nitrate of silver from time to time. After a regular outbreak in the throat and skin, a relapse may occur, sooner or later, and require renewal of the treatment. Sometimes very slight return of eruption or ulceration may take place after a longer or shorter interval, not requiring resort to mercury; warm baths and general care are sufficient, with caustic to ulcers.

The use of mercury is not applicable to the serious phagedænic affections of the pharynx and fauces, with the phagedænic rupial sores which often accompany them. Here iodide of potassium, sarsaparilla and opium, with such fluid nourishment and stimuli as can be swallowed most easily, are the best remedies. Local remedies are of little avail in a state of throat in which the very attempt at gargling would be injurious. Heretofore I have frequently employed cinnabar fumigation in these throats, with beneficial influence on the morbid surface; but the process is irritating and painful, and not free from danger; I have seen acute and fatal bronchitis excited by it.

The local symptoms improve under the general treatment, with merely such washing of the mouth by wine and water, for example, as may conduce to comfort. I am well aware that the influence of mercury on the system is capable of checking phagedænic ulceration, and that it may be used advantageously for rupial sores, when they appear early, and the patient's strength is unimpaired. Cinnabar fumigation of the throat has sometimes brought on salivation, under which phagedænic ulceration, both in the throat and skin, has been arrested and soon cured. This form of disease recurs frequently, and gives way to the iodide of potassium, which has the advantage over mercury of not injuring the constitution, however long or frequently it may be used.

The local use of mercury in phagedæna is not liable to the

same objection as its general employment; thus, the black or yellow wash may be used to sores, with or without poultice. The crusts should be removed from rupial sores by poulticing, followed by dressing with red precipitate ointment.

Cinnabar fumigation is one of the most powerful correctives in bad and obstinate phagedæna.

Iritis.—Cases of this affection differ widely from each other in the degree of inflammatory disturbance, which may be most acute, with great local suffering and proportionate constitutional affection, or perfectly mild, with little or no pain in the organ, and no other inconvenience. The majority of cases lying between these extremes are, perhaps, rather more allied to the chronic than to the acute form. Acute iritis demands active treatment, by general or local bleeding and the subsequent use of mercury. An acute case, with pain in the globe and head, and fever, in a young and strong person, or a milder attack in both eyes, would require general bleeding or a copious abstraction by cupping on both temples, performed by a skilful operator. Cupping on the temple, or at the back of the neck, or free leeching on the temple and the frontal region, may be resorted to in other cases. It is seldom advisable to omit local bleeding altogether in the early stage of the complaint. After the loss of blood and evacuation of the bowels, if that should be necessary, two grains of calomel, with one fourth or one third of a grain of opium, should be administered three or four times in the twenty-four hours. Poppy fomentation or tepid water of a temperature agreeable to the patient's feelings may be used to the eye. As soon as the mercury affects the mouth all the symptoms are decidedly relieved. The mercurial influence should be maintained, either by the same means or the milder agency of the gray powder or blue pill, until the discoloration of the iris and the red zone round the cornea have disappeared and vision is restored.

The iodide of potassium may be advantageously substituted for mercury under certain circumstances; for instance, if the latter, fairly tried, has not done all the good that might be expected, if the inflammation, although abated, still lingers on, or if it should relapse, or mercury should disagree.

The use of belladonna is advisable in conjunction with the mercury, in order to counteract the tendency to contraction of the pupil. This remedy does not act on the iris so long as it is actively inflamed; it may be employed as soon as the inflammation begins to decline. As the solution of the extract or of atropine dropped into the eye would irritate, the extract, moistened with water to the consistence of honey, should be smeared on the brow and supraorbital region once in twenty-four hours, and washed off at the end of an hour. The combined effect of the mercury and belladonna in a recent state of the affection may detach adhesions of the pupil or cause their elongation, so that they may not interfere with the motions of the iris. When the nocturnal pain is severe, and not relieved by the means already specified, it may be lessened or entirely prevented by rubbing at bedtime, on the frontal and temporal regions, six grains of mercurial ointment mixed with two grains of opium.

Where iritis has come to an end, vision being completely restored, the eye not unfrequently remains irritable, or, as patients call it, weak, for a longer or shorter time, more particularly if the attack has been acute or the treatment either imprudently delayed or not followed up with sufficient care. The eye will not bear strong light, exposure to cold, or employment in reading or writing, without temporary vascular congestion, lacrymation, and pain. Relapse of inflammation is easily produced by such causes. Patience and prudent care are the best preventives and remedies. Continued pain in the organ may require a blister at the back of the neck.

Sometimes advantage is derived from dropping the Vinum Opii into the eye once or twice daily; protection from light by a green shade or coloured glasses may be useful.

If, under neglect, the inflammation has continued with complete loss of vision for the time, the proper treatment should still be tried. Vision may be improved and is sometimes recovered under circumstances which seem desperate at first sight. Again, supposing the inflammation to have passed off without the use of mercury, leaving the organ apparently in its normal state, but without improvement of sight, a course of that medicine ought to be tried. I have seen vision greatly improved under such circumstances, although from five to eight weeks might have elapsed from the commencement of the attack before the mercurial treatment was adopted.

Treatment of syphilitic disease in bones and joints.—When these symptoms occur in combination with other secondary effects of syphilis for which mercury is employed, they yield favorably to the influence of the remedy, which exerts the same power over them when they occur alone. But in the latter case we prefer the iodide of potassium, which has a singular power over all these affections, controlling them as effectually as mercury, and acting more rapidly. It is equally efficacious in simple pain of bones and joints and in nodes, whether osseous or periosteal. The latter should be covered with mercurial or opiate plaster sufficiently large to include not only all the diseased part but to extend beyond it. If a node should be actively inflamed, other local means may be required, such as leeches, poultice, blistering, and rest. If suppuration should take place, with great pain, a free opening may be necessary; this is only to be resorted to under urgent circumstances, as such swellings often subside without surgical interference. Periosteal swellings of the cranial bones and

face are soft, obviously containing matter, but it is not necessary to puncture them.

I saw a gentleman in the spring of the year with a large periosteal swelling on the forehead; it was soft, without redness or pain, and the health was good. Four years previously there had been slight sores on the glans, which got well in three weeks, without the use of mercury. A long course of secondary symptoms, eruptions, sore throat, iritis, and circular sores, in various repetitions and under different modes of treatment, ensued. An incision down to the bone had been strongly recommended, but declined. The health being quite good under sarsaparilla, which had been taken for some time, I advised that it should be continued, with an evaporating lotion to the swelling if it should become heated. He continued well through the summer, following his profession, that of a barrister, actively. In the beginning of September there was a soft swelling, nearly two inches in circumference, at the upper part of the frontal bone, and a smaller near the brow. There was a general swelling over the ossa nasi, containing matter, with redness and thinness of the skin. By the middle of October the matter had entirely disappeared from the nose, the skin remaining red, with doubt whether it adhered soundly to the bone. In November, the skin over the nose still remaining red, there was slight discharge from a minute opening, which soon closed. At the end of the month the periosteal affections had entirely disappeared, the patient was in excellent health, and there was no return of disease. The course of the disease has been equally favorable in the great majority of similar cases which have come under my observation.

When a periosteal node continues very painful, in spite of all means, local and general, the only remedy that remains is a free division of the part in its whole length down to the bone.

More or less severe pain in the joints and limbs is often experienced in the outset of constitutional syphilis, accompanied with general febrile disturbance, and it goes off in proportion as that subsides. The more serious affections of the former are generally seen in an advanced period of the complaint, and especially in phagedænic cases. There may be inflammation of the synovial membranes, with effusion into the joint, or general and painful inflammatory enlargement, without any evidence of increased secretion. If the local suffering is not relieved by the iodide of potassium and opium a few leeches may be advisable, although the patient is probably in a weakened state. Blistering may also be advantageous.

The *nose* is sometimes, but rarely, affected in the early period of secondary symptoms. I have seen it yield at that time, like other concomitant affections, to the use of mercury. Should this fail, iodide of potassium and sarsaparilla must be substituted, which are the best remedies for the complaint in its tertiary form. The accumulation of dry crusts in the nostrils is a source not only of inconvenience but pain; it may be obviated in some degree by the steady use of tepid water, either snuffed up from the palm of the hand or more forcibly introduced by syringing. The fetid discharge will continue so long as irritation is kept up by the presence of dead bone, which should be removed surgically as soon as it becomes loosened. This unpleasant symptom may be lessened for a time by injecting a solution of chlorate of soda, as strong as the lining membrane will bear. The regular employment of tepid water to clear away the crust and discharge, followed by syringing with the yellow wash or with a solution of bichloride of mercury, in the strength of half a grain to two grains to the ounce of water, taking care that none of it shall be swallowed, will be useful in all respects.

Treatment of mucous tubercles, warts, condylomata.—The first indication is to restore the irritated and inflamed surface, from which these growths proceed, to a healthy state. When the external organs, perinæum, and neighbouring skin, in females, are in a state of erythematous redness, with excoriations and superficial ulceration, aggravated by neglect and irregularities, careful ablution with soap and water is the first step; it may be advantageously extended to the entire person. The part, when carefully dried, should be thoroughly soaked with solution of caustic, of two to five grains to the ounce. Lint wetted with solution of sulphate of zinc, three grains to the ounce, and kept on the part for two or three days, may be used instead. Means must be employed in the meantime to check the discharges which have kept up the irritation. The mucous tubercles may now be dusted with the oxide of zinc in powder, under which they shrink and dry up speedily, or they may require to be touched once or twice with nitrate of silver. The same means are applicable to small warty growths of the vascular and moist kind. Larger excrescences, whether in males or females, sometimes shrink and disappear under the powder consisting of sulphate of copper and powdered savine in equal proportions. Strong acetic and nitric acids are available for larger warty and condylomatous masses. If these strong applications should act too slowly and imperfectly, the knife may be used, with the subsequent use of nitrate of silver, if a disposition to reproduction should appear. Very copious bleeding, which comes from the entire surface, may follow excision, and require the use of the tincture of the sesquichloride of iron or of the perchloride of the same metal.

These affections possess no specific character; they are seen most commonly in connexion with venereal disease, but may arise equally from other causes of irritation.

In considering the treatment of constitutional syphilis it is necessary to speak of inoculation and syphilization, on the former of which I have little and on the latter no personal experience. Mr. Hunter and Mr. Benjamin Bell, of Edinburgh, many years ago, occupied themselves much with inoculating both gonorrhœal matter and the discharge from venereal sores, principally in reference to the question of identity or diversity of the poison in the two cases. For some years inoculation of patients, with the discharge of their own primary sores more particularly, has been extensively practised in France, and perhaps elsewhere on the Continent, partly for pathological illustration, partly as an assistance in diagnosis and a guide in treatment. As this proceeding throws little light on the nature of the disease and affords still less aid in its management, I cannot help considering it unnecessary as well as dangerous, and I am at a loss to understand what justification can be pleaded for its continuance.

Two large, most painful, and intractable ulcers, the result of two inoculations, were under my care for several weeks, resisting every variety of treatment. The patient resorted elsewhere for the relief which I had failed to give him, so that I do not know how the matter ended. The inoculation in this case was performed by a foreign physician, then resident in London.

Syphilization consists in producing a syphilitic sore by the inoculation of infectious matter, then inoculating the patient with discharge from his own sore, and so on repeatedly. The result of experience is alleged to be that the effect becomes gradually milder and milder, till it is reduced at last to a mere puncture, which does not discharge, the patient being then said to be syphilized. The secondary symptoms, for which the treatment is recommended, are said to come to an end during the process. This proceeding has been largely prac-

tised in the north of Europe, particularly in Norway, where Professor Boeck, of Christiania, has long been occupied in a laborious investigation of the whole subject, on which Professor Sperimo, of Turin, has also bestowed much attention.*

Syphilis in infants.—Mr. Hunter concludes his work on the venereal disease with a chapter "On Diseases resembling the Lues Venerea, which have been mistaken for it," in which, as well as in a former part (section ii, part vi) he details some strongly marked cases of this affection, of which he absolutely denies the syphilitic character, having satisfied himself by reasoning that the contamination of children by the constitutional disease in their parents is impossible. It appears accidentally that some of his contemporaries at least took a more just view of the subject, which seems, however, to have been less clearly understood than might have been expected, considering the frequency of the affection, its unequivocal origin, the unmistakeable character of the symptoms, its easy and frequent communication from infants to their nurses, and the mode of cure.

To this original infantile disease, and to its various consequences, which may be developed at a more or less remote period after infancy, the name of hereditary syphilis has lately been given. The name is objectionable; it will not be misunderstood by medical persons, but it is likely to be

* If I am not mistaken, the notion has also been entertained that healthy persons might be rendered insusceptible of syphilis by this process of syphilization. We cannot be surprised that the French Academy of Medicine, after a long debate, should have recorded its entire disapprobation of the whole scheme. I have heard of one instance in which the plan has been attempted in London, with results too well calculated to discourage any repetition of the experiment. I trust that this example will not be imitated, and that the inoculation of syphilis will be entirely discontinued. An account of the entire subject will be found in the 'British and Foreign Medical Review' for 1857 and 1859.

misinterpreted by others, and to excite in parents the alarming apprehension that syphilis may descend to their offspring, like scrofula. It is incorrect in pathology, by applying the same epithet to two things so essentially distinct as natural peculiarity of constitution and the influence of a morbid poison. This objection is strengthened by the circumstance that considerable additions have lately been made, on grounds which are at least very questionable, to the list of unpleasant consequences ascribed to the so-called hereditary syphilis.

Syphilitic infants are sometimes born dead, with evidences of previous general disease of the integuments. They may come into the world alive, with extensive inflammation of the skin, the cuticle peeling off, thin, emaciated, and soon dying. More commonly they are born well, and begin to show the disease on the skin in four or five weeks after birth, possibly sooner or later. The first symptoms, excoriation, superficial ulceration, or reddish patches, are seen about the organs of generation, anus, and nates. Blisters are spoken of by the women who see the disease in its earliest stage. The affection of the skin extends gradually over the body, in smaller or larger patches of light-brownish red, with slight roughness of surface and peeling of the cuticle, even on the palms and soles, without much redness of the skin. There is redness and excoriation, with scaly state of the cuticle, at the back of the neck and on the occiput. The face is disfigured by the eruption, with fissures at the angles of the mouth, aphthæ of the mucous membrane, and rawness of the palpebral margins. The child snuffles, and the nostrils are soon filled with a thick, yellow matter, rendering them impervious to air, so as to make sucking difficult or impracticable; hence loss of flesh, miserable emaciation, fretfulness, and irritability, on which, if unrelieved, death speedily supervenes. Iritis is an occasional, but not frequent, concomitant of the disease.

I have seen cases of infants in the first and second year, with pupils contracted and closed by adventitious membrane and total loss of sight, in whom the affection had been probably syphilitic.

The child of a gentleman who had had primary sores before marriage became affected a few weeks after birth with eruption all over the body; it wasted, and seemed on the point of dying, but recovered by the use of mercury in small doses. In a few weeks more severe inflammation of the eyes came on, which was arrested by mercury in small doses, but the child became blind. When I saw it, several weeks afterwards, one pupil was fixed, with an opaque membrane behind it. The other pupil was clear, but without motion, and the child was blind.

I have seen one instance in which the vascular surface on which the nail rests was inflamed in all the toes of both feet, more particularly in the great toes. There was discharge of yellow matter, drying and hardening under the loose edges of the nails, and raising them, the nails themselves exhibiting a lightish-brown discoloration. Separation of the entire nail occurred only on one of the great toes, leaving a raw surface, which soon healed. It was the case of a healthy infant, about eight months old. The disease yielded slowly to the use of the Hydrarg. c. Cretâ. The remedy was discontinued rather prematurely, when a relapse of the disease took place, and a very slight discoloration of the finger-nails of both hands was observed. Permanent cure was effected by repetition of the treatment, which did not disturb the health. An attack of syphilis in the usual form, but not severe, had occurred in this case before I saw the infant.

The treatment of these cases is simple and successful. The disease yields readily and quickly to mercury, which these young subjects bear very well. Three grains of the Hydrarg. c. Cretâ, a grain, or half a grain of calomel, may be given

twice daily. The eruption goes off, the discharge from the nose ceases, and the child recovers flesh, regaining health and strength not unfrequently when there seemed hardly a hope of recovery.

It has been recommended, and probably practised in France, to treat syphilitic infants through the mother, by administering mercury to her. As infants bear the remedy better than adults, there seems to be no advantage in a roundabout way of proceeding, which subjects the mother, if she is free from disease, to the inconvenience and possible injury of mercurial influence unnecessarily. I have never tried this practice nor heard of its employment in this country.

Syphilis as seen in the infant is in the constitutional form, or that of lues venerea, the infection having been conveyed by the blood of the mother, who has had the same disease. I have not known of any mischief to the child from primary disease in the mother at the time of parturition. A young woman of sixteen or seventeen, in the sixth month of pregnancy, was under my care in St. Bartholomew's, with bad and obstinate primary sores, for which it was necessary to use mercury so freely as to cause salivation, under which they healed favorably, without injury to her health, and she left the hospital for her confinement, with instructions to bring the child at the end of a month, which she did, both herself and the baby being then perfectly well. She was desired to bring it again in another month, but she came in a fortnight, with the disease clearly developed in the child and an ulcer of each tonsil in her own throat. By the use of mercury both mother and child soon recovered, but in the course of a month a phlegmonous suppuration occurred below and behind the jaw of the child; it was opened, and soon got well. Although in this case no constitutional symptom had occurred in the mother before delivery, we cannot doubt

that the constitution had become affected previously to that time.

The effect of the venereal disease, when it has been introduced into the system of the mother, and has thus influenced the health of her offspring, does not end here. The contaminated infant may communicate the malady by suckling to a healthy woman, in whom, although the source of infection has been constitutional, it appears in the primary form, that is, in ulcers of the breast, with glandular swellings in the axilla, these being followed by the usual train of secondary symptoms. The offspring of a woman thus diseased will be syphilitic, and capable of communicating the disease. This serious misfortune is not confined to a single birth, but may extend to several, whether the original affection was caused by sexual intercourse or in other manners. These points, as well as the general history of the complaint, its effects and treatment, are sufficiently illustrated by the following cases.

Mrs. B—, twenty-nine years of age, who had been married ten years and had ten children, had given birth to a healthy child four years before I saw her. When it was a month old she went as wet-nurse to a place where she stayed three months; the infant was perfectly healthy. She then went to suckle a child three weeks old, whose mother had died suddenly. This child had a sore mouth when she took to it. In a week afterwards she says that it came out in sores on the seat, that the nostrils ran with corruption, the eyes were sore, and the skin of the head peeled off. She suckled this child for ten weeks, when it died. Both her nipples began to be sore as soon as she took to this child, and a lump as large as a walnut formed in the left armpit. Her throat became ulcerated, and was so bad that what she drank ran out of her nose. Her throat was bad for five months, and got well under salivation, and nothing has ailed her since. Within

two years she gave birth to three dead children. Three former children had been born alive and healthy. The fourth infant, for which she consulted me, was born healthy, and showed symptoms at the end of four weeks similar to those of the diseased child which she had suckled formerly. When I saw it, at the age of five weeks, there were copper-coloured eruptions on the body and limbs; the edges of the eyelids excoriated; the nostrils filled with thick, yellow matter; the child was thin and fretful. It recovered speedily under a nightly dose of the Hydrarg. c. Cretâ.

I was consulted in February, 1827, by Mrs. H—, a respectable woman, for a disease of the breast and other symptoms, bringing with her a child that she was suckling, which had been and was then ill. A lady in the family way, for whom she washed, observing that she had a healthy child at the breast, asked her to take her infant when born, and suckle it. She consented, and took the child which had been born early in the previous October, keeping her own infant to the right and the nurse-child to the left breast. She stated that the latter, a healthy child at birth, became ill in a week; small blisters came about the organs of generation, and then spread over the body, with redness of the skin, which peeled off. The nostrils became stuffed and the mouth very sore. At this time her own nipple began to suffer. The child took white powders, which must have been mercurial, and got better, but her own nipple and breast were still bad. The infant had the marks of former eruption on various parts of the body. There was some thick, yellow matter in the nostrils, and the mouth was aphthous. I ordered for it a daily dose of Hydrarg. c. Cretâ.

Mrs. H— had a smooth red ulcer not excavated with indurated base, about the size of a shilling, on the areola of

the left breast. The substance of the gland above the nipple was indurated, forming a lump as large as a hen's egg. To a question whether she had eruptions or sores elsewhere, she answered "no;" but I found, on careful examination, a few small, reddish and slightly scaly spots on the forehead, scalp, arms, and thighs, and two or three slightly elevated superficial ulcers on the labia. She was weak, from suckling the two children. Her own child, which had been always kept to the right breast, was quite well. I ordered that it should be weaned, and prescribed for the mother a blue pill, with a little opium, night and morning. These means were continued to March 19th, when the ulcer on the areola had healed, the swelling of the breast had gone, and the eruptions had disappeared. The nurse-child had recovered, but was emaciated. It was sent to another nurse about the middle of April, having then a slight return of symptoms. The new nurse observed that the child's mouth was sore, as she supposed, from thrush; her own nipples, which had been previously quite well, immediately became sore. Mrs. H— had a fresh appearance of scaly syphilitic eruption and ulcers on the labia. The former treatment was resumed for both. The new nurse had common inflammation of the left breast in May, ending in abscess, which was opened; she had no syphilitic symptom. The child was well, except that the nose was a little stuffed. The second nurse, whom I saw on July 17th, had a superficial sore, with moderately firm base, the size of a shilling, about an inch from the nipple; it had existed three weeks, and had not changed under any applications she had tried. The child, whom she had suckled for seven weeks, had died three weeks previously. Blue pill, night and morning, with black wash. July 24th.—Small, reddish-brown eruptions, slightly raised, were thickly scattered over the hands, including the palms and arms, the feet and

legs; there were none on the head or trunk, and there was no sore throat. August 25th.—The mouth had been affected by the mercury. The ulcer of the breast had healed, without leaving hardness. The eruptions had disappeared, and a few small spots had come out on the face and head, for which the mercury was continued in diminished quantity. On April, 1828, this second nurse was delivered of a fine, healthy infant, which was brought to me on May 20th, covered with syphilitic eruption from head to foot. It had commenced a week after birth, and gradually extended, consisting partly of small, red patches, but principally of larger portions discoloured in the same way, red or reddish-brown, with the cuticle peeling off or scaly; the cuticle was peeling thus from the soles, toes, hands, and fingers, in their whole extent. The organs of generation, anus, buttocks, and thighs, were deep-red and partially excoriated, the lips chapped and scaly; no part of the surface was free from disease. The child was fed by hand, the mother having no milk. She was dying of phthisis in a month afterwards, the child having nearly recovered under the use of mercury. Mrs. H—, whom I saw in the beginning of May, 1828, was then in perfect health and strength. She had experienced slight eruptions from time to time, but in no great number; they went away, and were succeeded by fresh ones; she had taken no medicine lately.

It will be observed that the infant of Mrs. H—, who had never been put to the same breast as the nurse-child, remained free from disease. The same circumstance was noticed in one of the interesting cases recorded by Mr. Hunter.

In the seventh volume of the 'Medico-Chirurgical Transactions' there is an interesting paper by Mr. Hey, entitled "Facts illustrating the Effects of the Venereal Disease on the Child in Utero," in which he discusses the question whether the disease can be communicated to the wife by cohabitation

with a husband labouring under secondary symptoms. Without being able to establish the point by direct evidence, he is of opinion that it may be so communicated; I agree with Mr. Hey on this subject, although unable like him to adduce clear proof, which indeed is hardly to be expected. He mentions having seen several instances, in which the mothers' having been once affected has communicated the disease to two, three, or even four children in succession, each of them having the disease in a milder form than the preceding one, and this without any ground for suspecting a fresh infection. He subjoins the following interesting case:

In the latter end of the year 1770 and the beginning of 1771, a blind woman, who gained her living by drawing the breasts of women during their confinement, became affected with ulcers at the angles of the lips, which were judged to be venereal. He found that she had drawn the breasts of a woman who was supposed to be labouring under the venereal disease. He treated these ulcers as syphilis, and they healed under that treatment. He observes, that several women whose breasts had been drawn by this woman became affected with syphilitic disease. He mentions one case in particular. Mrs. B— had her breasts drawn twice by this woman, upon the death of her second child, which died of the smallpox, and within three or four weeks afterwards perceived a swelling of the axillary glands, and complained of soreness in her throat. The swelling in the axilla was, no doubt, the effect produced by this blind woman drawing her breasts. The gentleman who saw the sore throat, deeming it to be venereal, exhibited mercury, and it got well. During the treatment she became pregnant, but continued the use of the mercury during her pregnancy; and at the end of seven months she miscarried of a dead child. She became pregnant again in 1772, continued to enjoy good health, and was delivered of

a child apparently healthy in February, 1773, which she herself suckled. When the child was about six weeks old, an eruption which Mr. Hey judged to be syphilitic appeared upon its legs and arms. He put both the mother and child upon a mercurial course, giving the former small doses of calomel, and the latter Hydrarg. c. Cretâ. By that treatment, the child was in a short time freed from the eruption, but continued to take the medicine till the beginning of August. In October following, two or three small ulcers appeared on the outside of the labia pudendi of the child, and on that account the mercurial course was resumed, with the addition of an occasional dose of calomel. The ulcers were soon healed, but in May, 1774, the nostrils became sore, and the integuments of the nose were also tender; at the same time the child grew hoarse. The mercurial course was repeated, and continued for two months. The child also took the medicines during part of the months of September and October; after which time there was no recurrence of disease. In June, 1775, this same woman bore another child, which was apparently healthy at its birth, and continued to be so for a few weeks. Blotches of a copper colour then came out upon the skin, but soon disappeared, upon having recourse to mercurial medicines. After some time the blotches appeared again, and were accompanied with a small ulcer in the labium pudendi, as in the former case. The child was, however, completely cured by a repetition of the treatment, and remained well.

The mischiefs attendant on venereal infection in utero do not always terminate with the disappearance of the symptoms first developed in a few weeks after birth. There may be relapses, as seen in some of the cases now related; and we sometimes see warty, or rather condylomatous growths around the anus in young children which are of suspicious character.

Mr. Jonathan Hutchinson has pointed out and figured malformations of the incisor teeth, which he regards as clear indications of syphilitic infection. I have seen a girl about eight or ten years old, in whom the four adult incisors, very well-formed teeth, had become so loose that they were ready to drop out. They came away almost without force, the corresponding alveolar portion of the superior maxillary bones being necrosed. Although the mother who brought this patient to the hospital said there was nothing else amiss in the mouth, I looked into the throat, where I found that the uvula had disappeared, and the velum had undergone ulceration, which had not completely cicatrized. According to the account of mother and daughter, who were decent and respectable persons, this disease had not been noticed. There was also a large node of the tibia, which became very painful, and proved extremely obstinate. The dead portion of bone came away in time, leaving a round opening of communication with the nose, which in a few weeks was in a state to admit of closure by a plate of vulcanite bearing the teeth, and adapted to the palate by Mr. Alfred Coleman so skilfully that all the functions of the part are performed perfectly. The mother had been affected with syphilis, including nodes of the cranium.

CHAPTER XVIII.

CLINICAL LECTURES ON THE VENEREAL DISEASE, REPRINTED FROM THE 'LONDON MEDICAL GAZETTE,' VOL. XXI.

LECTURE I.

MODE OF STUDY; CHRONIC PHAGEDÆNA; OTHER FORMS OF PRIMARY SYPHILIS.

THEY who wish to learn the nature of the venereal disease may choose between two modes of proceeding. One is, to read books on the subject; the other, to enter the wards of an hospital, and study the facts there presented to observation, with a mind as free as possible from doctrines and preconceived notions. The two methods ought to coincide; but they differ widely in their results. There cannot be the slightest hesitation in determining that the latter is preferable for the purpose of gaining correct knowledge. If you expect to find what you read confirmed by what you will observe for yourselves in this hospital, you will be disappointed; the two modes of study do not differ more essentially than the conclusions to which they respectively lead. The statements in books are to the effect that there is a certain virus or poison, which, when applied to the human body, produces effects so well marked in character, and so regular in progress, that we may by them easily distinguish syphilis from

all other forms of disease. Thus, we should expect to find the great pox as definite in appearance and course as the smallpox or cowpox. Again, it is represented that other morbid phenomena, apparently produced in the same manner as this supposed regular syphilitic disease, are not venereal, do not result from the application of a poison, and require a different mode of treatment from true syphilis.

When, on the contrary, we look over the several cases presented to our observation in a large hospital, we see affections very different from each other in appearance, and in other essential characters, yet coming under the common denomination of venereal disorders. Different as these are, they seem all to arise from a common source; they owe their origin to promiscuous sexual intercourse, and are, therefore, justly denominated *venereal.* I know no reason why any one of these varieties should be called *true syphilis* rather than any other. We may, therefore, abandon the attempt to distinguish between syphilis and the diseases resembling it, and discard from our vocabulary the terms *true syphilis* and *pseudo-syphilis,* and the others founded on the hypothesis just noticed; terms which have either no clear meaning or an erroneous one, and are only calculated to introduce confusion and obscurity into a subject sufficiently difficult in itself. If, then, you wish to learn the nature of syphilis, dismiss from your minds the speculations of authors, and observe the phenomena, progress, and treatment of the venereal cases in this hospital.

I now direct your attention to the case of William Smith, a tailor, in Lazarus Ward, who has already been in the hospital more than once. This is a well-marked example of phagedænic venereal disease, and it shows a correspondence in character between the primary affection and its secondary or constitutional consequences.

He was first admitted into the hospital on the 19th of May, 1836, with a phagedænic ulcer of the prepuce, by which the upper half, or two thirds of the part, had been destroyed to the basis of the glans. The ulcer had an irregular, ragged surface and edge, small portions of the latter being livid; there was no appearance of reproduction. The discharge was thin and ichorous; not abundant nor offensive. There was not much pain. The ulcer had existed eight weeks, during which time he had taken twelve pills, and employed a lotion, which caused considerable pain. A few large, brownish-red, cutaneous tubercles had appeared recently on the forehead and face. He was directed to take two grains of calomel, with one third of a grain of opium, three times daily, and to apply the black wash to the sore. He continued this treatment till the 6th of June, when the mouth had become considerably affected; he then left off the calomel and opium, and took five grains of the blue pill every night. During this time he was kept in bed, and confined to milk diet. Under this plan the ulceration was quickly arrested, and the sore, which had been spreading for eight weeks, healed rapidly; the tubercular eruption disappeared from the face.

The original sore, however, did not heal completely at the middle of the dorsum penis, where the ulceration had extended a little under the integument; it continued to burrow in this direction after it had cicatrized soundly elsewhere, and at last extended so far that it was necessary to lay open the undermined skin by a free incision, on the 13th of June. The unhealthy surface thus exposed was dressed succcessively with black wash and with the balsam of Peru. The sulphate of quinine, and the compound decoction of sarsaparilla, were administered internally. The patient left the hospital in the middle of July, freed from the local complaints, and in excellent health.

The case, thus far, shows the natural progress and the destructive effects of phagedænic ulceration, when unchecked; for, if we suppose the twelve pills taken before admission to have been mercurial, they had produced no sensible operation on the system. It shows that phagedæna, although essentially destructive, eating away the affected part by ulceration, as its name implies, is not necessarily active in its progress. It had here gone on uncontrolled for eight weeks, and merely destroyed a portion of integument. The effect, indeed, would have been more serious if the disease had been seated in the glans. The present case is an example of what might be called chronic phagedæna. It demonstrates further the powerful influence of mercury over the disease, and its unequivocal instrumentality in effecting a cure. Some have believed that the use of mercury is capable of giving the phagedænic character to an ulcer. Here, however, the primary form of the complaint was phagedænic; this character rapidly disappeared under the use of mercury, being succeeded by a healthy restorative process.

W. Smith returned to the hospital, on September 10th, 1836, with a relapse of ulceration on the penis. I was absent from London at the time, and he consequently came under the care of my colleague, Mr. Lloyd. I understand that the whole dorsum of the penis was occupied by a foul, phagedænic sore, of circular figure, which extended a little in the direction of the pubes. The surface was so foul, and it extended so rapidly, that Mr. Lloyd had thought it proper to apply the strong nitric acid. The sore, when I saw it, was covered by the brown crust which follows the effective application of that escharotic. The separation of the eschar was followed by a clean and granulating surface, and cicatrization was soon completed. On this occasion no mercury was used, either

externally or internally, and the patient was discharged perfectly well in October.

On January 6th, 1837, he was again admitted with phagedænic ulceration of the fauces and face, and inflammation of the periosteum. The velum palati, uvula, and tonsils, the upper and back part of the pharynx, were occupied by an irregular ulceration, with a lardaceous surface, ragged edge, and bright red margin; deglutition was performed with difficulty, and with great pain. There were three or four circular phagedænic sores on the face. There was a soft, fluctuating swelling over the left superciliary ridge, and another on the os malæ of the same side. The carpal extremity of the left ulna presented a large, painful swelling of the periosteum. All these affections were of painful character; they had interrupted rest, and impaired appetite, causing emaciation, and great weakness. These evils were aggravated by great alarm respecting the nature and progress of the disease, and depression of spirits. I found, on inquiry, that he had never been affected with syphilis before; that he had been of regular habits; and that he had been particularly careful of himself since his first admission into the hospital. The painful nature of the symptoms, and the enfeebled condition of the patient, required narcotics, and strengthening means, both medical and dietetic, and presented a strong contra-indication to the general use of mercury, although the influence of that remedy was required to check the progress of disease, particularly in the throat. He was ordered to fumigate the throat with cinnabar every night and morning; to take the concentrated compound decoction of sarsaparilla three times a day, and five grains of the Pil. Saponis c Opio at night; and to feed on milk and broth, or on meat, according to his power of swallowing. On the 9th eight ounces of port wine were ordered for him daily, and the dose of the

Pil. Saponis c. Opio was increased to seven and a half grains. On the 24th the fumigation was continued once daily, the mouth having become sore, and linctus was ordered for a cough. Under this treatment, the local symptoms and the health improved rapidly; the ulceration of the throat lost its phagedænic character, and soon healed; the ulcers of the face cicatrized, the swelling of the ulna disappeared, and those of the frontal bone and os mala broke and discharged, the openings subsequently scabbing over. With the abatement of pain the rest and appetite returned; the flesh and strength were restored, and the patient left the hospital in the middle of February, not only free from disease, but stout and in excellent health.

On this occasion mercury was only used locally, viz., in the form of cinnabar fumigation; but, as it happens not unfrequently under such circumstances, the specific action of the remedy on the constitution was produced, and ptyalism ensued. The rapid cicatrization of the ulcers in the fauces and in the face, and the corresponding dispersion of the periosteal swellings, were probably owing in great measure to this operation of the remedy. The soothing and restorative medicine, and the generous diet, which were necessary on account of the pain, emaciation, and weakness, were advantageous in enabling the patient to support the action of mercury.

Smith seemed completely restored when he left the hospital; but the cure was not yet permanent, for he is now again in Lazarus ward, affected with disease of the nose, ulceration of the throat, enlargement and induration of the right testicle. He came in on the 23rd of this month (June). There is a large, ulcerated opening in the septum narium, forming a free communication between the two nostrils, both of which are in great measure blocked up with bloody scabs

and stinking matter. A most offensive fetor is diffused to some distance round the patient. The bridge of the nose has partially sunk, and has become turned to one side. The integuments are swelled, of dull red colour, hot, and painful. There can be no doubt that the bone is diseased, from the yielding of the septum, the offensive stench, and the inflamed state of the external coverings. The affection of the mucous membrane is probably secondary; the seat of disease in the pharynx is its upper and back part, so high up that the lower portion only of the ulcer comes into view; it has the same phagedænic character as on the former occasion. This position of the ulcer in the pharynx, if not peculiar to phagedænic syphilis, is very common in that form of the disease; the testicle is moderately enlarged, hard, somewhat irregular, and knotted, painful on pressure; the scrotum is red, and rather warm.

The remedies ordered were, solution of corrosive sublimate (half a grain to the ounce) in lime water, to the nose, previously clearing it of scabs and matter by means of tepid water; five grains of hydriodate of potash in an ounce and a half of compound decoction of sarsaparilla, three times a day; mercurial liniment to be rubbed on the testicle. The patient has now been in the hospital a week under this treatment, and already feels much better.

The foregoing is a striking case of primary phagedænic ulcer, followed by the constitutional effects which are observed in this form of syphilis more particularly, viz., tubercular eruption, and phagedænic ulcers of the skin, fauces, upper and back part of the pharynx; disease of the nasal bones and membrane, and affection of the testicle. It shows the rapid succession of the various secondary symptoms, which is usually observed in this form of the complaint.

Mercury is of great service in the treatment of phagedænic

syphilis; but it must not be employed indiscriminately. If we proceed on the old notion of its being the specific and sole remedy for such complaints, employing it freely at first, recurring to its use when the disease appears again, and so on, *toties quoties*, we shall seriously damage the constitution, aggravate the patient's sufferings, and increase the liability to relapse. The disease itself is of painful nature; it causes loss of flesh and general depression: repeated and long courses of mercury act like a poison in this dilapidated state of health. It is necessary to check the destructive progress of the primary affection, and this object sometimes cannot be accomplished without the full action of the remedy on the mouth. Its local administration is of great service in phagedænic secondary symptoms; but I avoid, if possible, its internal use, especially, when the powers of the constitution have been impaired by the painful nature and the duration of the disease.

[Smith remained in the hospital four or five weeks on the last occasion. Before he went out the whole septum narium came away in several pieces. The discharge ceased, and the nostrils became clear, but the deformity of the nose was increased; the throat soon got well, and the swelling of the testis subsided. He showed himself at the hospital from time to time during the autumn, continuing free from disease and in excellent health. It may be concluded that he continues well, as he promised to return in the event of any relapse.]

There are at present other cases in the hospital, illustrating the various effects produced by what appears to me a common cause, promiscuous sexual intercourse; and clear evidence to the same point may at any time be obtained by looking over the patients in any one venereal ward.

James Wood, admitted June 15th, has six or eight small circular sores on the lining of the prepuce, at its orifice.

These sores are a little elevated, so that the entire ulcer is in slight relief; they are of florid red. This is a common form and situation of primary syphilis. The sores, which are numerous, present a little ulcerative excavation; they then become raised, as you see them in this patient, and of florid colour, and subsequently cicatrize. From four to eight weeks not unfrequently elapse before the healing process is completed. Remember that this elevation belongs to one period only in the progress of the affection. These cases show that excavation, and a foul, tawny surface are not essential characters of a syphilitic sore; also, that primary sores may be numerous as well as single.

Thomas Haley, in the same ward (Lazarus), has a sore, not excavated, seated on an indurated basis, at the root of the prepuce, just behind the glans. The induration, as large as a horsebean, feels like a lump of cartilage under the skin. In this and the preceding case black wash is applied to the part, and five grains of blue pill are taken twice daily.

Mr. Hunter's description has led to the belief that a venereal sore is circular, excavated, foul or tawny on the surface, and with an indurated base and edge. A little observation will be sufficient to show that the latter character is not essential, and that it is not seen in the majority of venereal sores. The subcutaneous hardness, which is certainly very peculiar in indurated chancres, depends in some measure on the texture of the affected part; its development requires the existence of loose, cellular tissue under the skin. It is not seen in ulcers of the glans, where that tissue exists sparingly; we meet with it in the prepuce, and especially at the angle between the lining of the latter and the body of the penis, where the cellular tissue is abundant. An ulcer sometimes occupies the corona glandis and the basis of the prepuce, in which case the preputial portion of the sore may

be indurated, while that on the glans possesses no such character.

Another patient in Lazarus has a sore as large as a sixpence on the integuments of the prepuce. The ulceration is superficial, with a clean, smooth surface, affording a thin discharge in small quantity, which concretes into a slight, closely adhering scab. The margin of the sore is a little raised; there is a bubo in the right groin, while the sore is on the left side of the prepuce. This occurrence of glandular affection on the side opposite to the ulcer is occasionally noticed. This case is treated in the same manner as the two preceding.

Thus these four cases of disease arising from promiscuous sexual intercourse, present to your observation four primary affections essentially distinct; and I know no reason why one of these should be called true syphilis more than the others. Hence syphilis, whatever may be the nature of its unknown cause, and whether that cause be one or many, produces phenomena considerably varied. They who have been endeavouring to find out true venereal disease, in the expectation of finding, as in smallpox or cowpox, an affection of determinate character, commencing at a regular period, running a certain course, lasting a certain time, and coming to a definite conclusion, have been seeking for what does not exist. The whole phenomena of syphilis, the characters of the primary disease, the constitutional effects, the duration of both, the intervals between the primary and secondary affections, and between the successive manifestations of the latter, present numerous and striking differences.

LECTURE II.

ACUTE PHAGEDÆNA AND SLOUGHING SORE.

I CALLED your attention, gentlemen, in the last lecture, to four cases of primary syphilitic ulcers, then in the hospital. All the sores possessed strongly marked characters, and no two were alike. We thus learn that the venereal poison, whatever be its nature, does not produce one unvarying set of effects. Further evidence of similar nature might be adduced in corroboration of the same conclusion. Thus, the first effect of the venereal poison may be an ulcer quite superficial, or a mere excoriation, without loss of substance. Many consider that such appearances are not syphilitic; I regard them just as much so as the other forms. They occur from promiscuous sexual intercourse, and are not seen in married life, where the parties strictly observe the marriage vow, nor in such as live chastely. They give rise to secondary syphilitic symptoms, and thus it happens that we see cases of the latter where the patient says that he has had no venereal disease. I was consulted, not long ago, by a gentleman with an attack of acute syphilitic iritis, of which the characters were so well marked, that I immediately told him that he had venereal disease of the eye. He said this could not be, for he had never contracted a venereal affection. On further examination I found that he had had what he called a rash over his body, that it had lasted three or four months, and that there were still some remains to be seen; these were small patches of scaly, syphilitic eruption. It appeared further, that some time previously to the rash he had had a slight excoriation on the penis, which did not heal completely for a few weeks. He had consulted a medical practitioner respecting the latter, who told him that it was a mere

excoriation, without any venereal character, and not requiring any particular treatment. The iritis in this case required active treatment; and the organ was not completely restored until the use of mercury, carried to the extent of affecting the gums, had been persevered in for four weeks. If the character of the primary affection had here been inferred from those of the iritis and eruption, we should have argued that it must have been decidedly syphilitic.

Whether this gentleman would have escaped without secondary symptoms, if the excoriation (as it was called) had been treated with mercury, must be uncertain: I think he would have had a better chance. If, however, he should hereafter experience further secondary symptoms, such as sore throat, affection of the periosteum, disease of the nose, he will not estimate very highly the knowledge and discrimination of the person who pronounced the primary complaint not to be venereal.

[No further symptoms have ensued in this case; at the end of eight months from the treatment of the iritis, the gentleman remains perfectly well.]

I placed before you, in the last lecture, a case of chronic phagedæna; that is, of an eating ulcer which proceeds slowly, which had lasted eight weeks without causing serious or extensive damage. Phagedænic ulceration may proceed more rapidly; it may destroy the glans in eight days. I will present you with an example of acute phagedæna. A gentleman, twenty-two years of age, observed an unpleasant appearance on the glans ten days after a suspicious connexion. For this he consulted a medical practitioner on a Thursday, and did not see him again till the following Sunday, pursuing his ordinary avocations, and living as usual in the mean time, the weather being very hot. I saw him on the following day (Monday), when his medical attendant in-

formed me that the complaint had consisted on the Thursday of a black spot, that it had increased fearfully by Sunday, when he recommended that I should be immediately consulted. I found a phagedænic ulceration, which had destroyed one fourth of the glans on its left side, bounded anteriorly by the frenum. This alarming sore had an irregular surface, with sharp, ragged edge; it was of a dirty yellowish and grayish colour, intermixed with bloody spots, and it secreted an offensive ichor, with strong and characteristic fetor. The glans was swelled and bright red. The prepuce could be easily withdrawn so as to expose the sore, which was painful. There was slight inflammatory tumefaction of the penis generally, which might be owing partly to the excitement and partly to exertion in hot weather. Eighteen leeches were applied to the penis, and afterwards bread poultice; black wash to the sore. The bowels were cleared by an active aperient, and subsequently he was ordered to rub in a drachm of the strong mercurial ointment every night, and to take two grains of calomel with one third of a grain of opium every eight hours. He was confined to bed. The circumstances of his domestic position, the painful nature of the complaint, which compelled him to observe perfect rest, and the severe constitutional disturbance, aggravated by high atmospherical temperature, prevented the use of the frictions; the calomel and opium were therefore given every four or six hours. On Wednesday evening he was in a high fever, the small upper apartment which he occupied being as hot as an oven. I bled him largely from the arm, and found it necessary to substitute an evaporating lotion to the penis for the poultice, of which he could not bear the weight. Two days after he was removed to another residence, where he had a cool and commodious apartment. The action of the mercury was slow in this instance; it did not cause

swelling of the gums nor ulceration, but it rendered them white, as if they had been covered by a thin, adventitious stratum, and it caused moderate ptyalism. The progress of the complaint seemed checked in the first twenty-four hours; but it was not decidedly arrested until about the seventh day. In the mean time it extended deeply, by a sloughing process between the glans and the corpus cavernosum penis; it destroyed the frenum, and showed itself to a small extent on the right side of that fold, but it did not enlarge beyond its original boundary on the left of the glans, and it left the prepuce entire. When the slough separated it had gone so deeply as to open the urethra to the extent of about an inch on its upper and left side. When the surface had been cleared the sore healed rapidly; and, as the prepuce was entire, while the contraction of the cicatrix lessened the apparent loss of substance in the glans, not only was the part again capable of all its functions, but its form had suffered very little damage. The mercurial influence was kept up until cicatrization was complete, a period of about four weeks. This is an example of primary sore spreading rapidly by destructive ulceration, which would, probably, have destroyed the glans in four or five days from the time I first saw it, if left to itself. The treatment demonstrates unequivocally the powerful influence of mercury over such affections.

No secondary symptoms followed in this case; the patient continued perfectly well.

I proceed to explain to you the nature and treatment of another form of primary syphilis, *sloughing chancre*, an affection in some respects more formidable than the preceding, the acute phagedænic sore. A lad of sixteen, who had recently left the country, contracted syphilis soon after he arrived in town. He immediately consulted a general

practitioner, who observed nothing alarming in the case. This was on a Tuesday, and he was seen again on the following Saturday. In the mean time he had been going into the city daily, from a distance of three miles, and returning, had been actively employed in business during the day, and living in his usual manner in the family with which he resided, the weather being very warm. The penis was now swelled, red, and painful; the orifice of the prepuce contracted, and there was a degree of feverish disturbance, rendering him incapable of further exertion. Depletion by venesection and leeching, with rest in the horizontal position, and other corresponding antiphlogistic measures, were immediately resorted to, and followed up effectively. The local mischief, however, seemed to advance, and loss of the penis was feared. I saw the patient on Wednesday, when he was in a state of the greatest discomfort from severe bodily and mental suffering. The penis was swollen generally, the prepuce more particularly, while a thin, bloody, and offensive discharge, with the peculiar fetor characterising these sloughing sores, issued abundantly from the contracted orifice of the latter. The part was so extremely painful that he could not bear the slightest touch. He was enfeebled by the depletion he had undergone, and by the entire want of rest, caused partly by constant pain, partly by mental anxiety and depression, with apprehension that he might lose the member entirely. I divided the prepuce in its whole length along the upper surface of the penis, finding that the most marked relief is experienced in such cases when the inflamed and ulcerated glans is liberated from the pressure which is caused by the swollen prepuce. Free bleeding ensued, as it usually does, from the edges of the incision. The relief thus afforded by unloading the vessels immediately engaged in the inflammatory mischief is an

important source of additional benefit in this mode of proceding. One half of the glans had perished, and was converted into a dark, greyish slough, separated from the living parts by a distinct line. Poppy fomentation and soft bread poultice constituted the local treatment, and the muriate of morphine was given at night to procure rest. On the following day he was much better; the division of the prepuce had been followed by immediate and effectual relief to the part, and the opiate had procured a good night. The slough was separating. In two days' time the separation had advanced considerably, leaving a rather foul and ragged surface, to which lint, dipped in the balsam of Peru, was applied. In two days more, the surface had become quite clean, and the balsam was left off, as its application caused pain. Soon after, the mortified part became entirely detached; although the slough extended deeply between the glans and the body of the penis, the urethra escaped. The sore now healed rapidly. The measures of general treatment after the prepuce had been divided consisted in a nutritious diet, with porter and wine, and the sulphate of quinine, in two-grain doses, three times a day.

No secondary symptoms ensued in this case.

This and other analogous cases show that the venereal poison may cause, not only inflammation, increased and altered discharge, thickening and various modifications of ulceration, but also loss of vitality more or less considerable. The mortified part is separated by the same process as in other cases, the surface left after such separation being perfectly healthy, and usually granulating and cicatrizing rapidly. An ingenious person has written a book to prove "the non-existence of venereal virus." We will not dispute about words; but we may be permitted to ask, if there is no venereal poison, how it happened that the first and sole

amour of a healthy youth, aged sixteen, should have caused the serious mutilation of which I have given you the history?

In respect to the division of the prepuce, a strikingly beneficial part of the treatment in these and other similar conditions of the glans and prepuce, fear has been entertained that the discharge from the diseased surfaces might contaminate the edges of the incision. This apprehension is altogether unfounded; in a large number of cases, where I have adopted the proceeding in this hospital, no such result has ever been noticed.

I have seen lately a greater number than usual of these serious phagedænic and sloughing diseases; some having occurred in private practice, where they are met with more rarely than in the wards of an hospital. These private cases are particularly interesting in elucidating the natural history of the disease; we can trace out its course more satisfactorily, and can ascertain that the distinguishing features of the complaint are not produced by causes which may be supposed to exert an influence on many hospital patients, such as intemperance, neglect, and perseverance in profligate licentiousness, after disease has been contracted.

I was consulted not long ago by a patient, sixty-four years of age, who said that he wished to have my opinion respecting an appearance on the penis. As he was preparing to show the complaint, I anticipated the nature of the affection from a most offensive smell proceeding from the part. He drew back the prepuce without difficulty, and exposed a slough of the glans as large as a shilling, partly yellowish, partly black, discharging a thin, fetid ichor. He did not relate how the affair had occurred, and it was not expedient to question him on the subject. I found that he had shown it in the morning to his medical attendant in the country, and had been induced by his report to come to town, where I

saw him in the evening. There was little or no swelling of the penis, and not much pain. I directed him to return home immediately; to go to bed, and remain there; to apply as many leeches as he could place on the penis; to use poppy fomentation and bread poultice, and take opening medicine. I told him that swelling and pain might be expected, and that a division of the prepuce would then be necessary. I did not see him again till the end of two days, when he was considerably worse. The penis and prepuce were swelled, but not considerably; the latter could only be withdrawn with difficulty. He had been in great pain for the last twenty-four hours, and had not slept during the preceding night. I divided the prepuce in its whole length. There was free bleeding, especially from one artery, and twenty ounces of blood flowed from the incision. Half the glans had mortified. The parts were now covered with the charcoal poultice, which is an excellent application, both for correcting fetor, and improving the condition of sloughing sores. The division of the prepuce at once relieved the pain, and it arrested the sloughing process. The latter effect has always ensued, within my observation, when the glans has been completely denuded in this way. The debility and the mental depression necessarily attendant on such an affection, and the treatment, required a nutritious and generous diet, with tonics and restoratives; these means improved and maintained strength. The slough, which was dense and hard, separated slowly; a month elapsed before it had completely come away, while in the preceding instance of a younger subject, the mortified part was loose and soft, and completely detached in a fourth part of the time. Here, too, as I have generally observed, the slough extended deeply into the glans, and made an opening into the urethra.

No farther unpleasant effect occurred in this case; several

months have now elapsed since the cicatrization was completed.

I attended another case of sloughing chancre some years ago. A gentleman, twenty-two years of age, had connexion with a female on October 24th. He had had none for a considerable time previously, and none subsequently before I saw him. On November 4th, he observed a small whitish place on the glans, and consulted a surgeon, who touched it with caustic, the application causing a little pain, and prescribed opening medicine, with three blue pills a day. On the fifth the sore place was larger, very painful, and produced a foul discharge. He was worse on the 6th, when three grains of calomel, and half a grain of opium, were ordered every six hours. He consulted me on the 7th, having taken four of the doses last mentioned, and feeling much worse. As soon as he opened his clothes to show the complaint, I recognised the peculiar fetor of sloughing sores. The prepuce was bright red, and slightly œdematous; the glans, equally red, protruded about half way at the orifice of the prepuce. The latter could be withdrawn with a little difficulty, so as to expose a slough equal in extent of surface to a shilling, of which about two thirds were on the glans, the remaining third on the reflected portion of the prepuce. The slough was black at one point; yellowish and dark red in other parts; it had the pulpy, glutinous appearance of sloughing phagedæna, and it projected above the level of the sound parts; it discharged a thin, red, and extremely offensive ichor. The neighbouring internal surface of the prepuce was highly inflamed. The whole penis was very painful. The mouth was not affected by the mercury.

The mercury to be left off; leeches to the penis, followed by poppy fomentation and bread poultice; the fomentation

to be injected under the foreskin. Aperient medicine. To keep in bed.

In the evening, the leeches having drawn much blood with considerable relief, the pain was lessened, the discharge less red and offensive, and thicker. The bowels had been freely opened; the pulse full and rather hard. I took away sixteen ounces of blood from the arm, and ordered a saline draught, with thirty drops of Tinctura Opii, if there should be such pain as to prevent rest.

8th.—The blood presented a thin, buffy coat; he passed a good night without the opiate. The discharge is no longer fetid; the prepuce is still inflamed and swollen; the glans and penis are very tender to the touch, and occasionally painful. Twelve leeches, which occasioned free bleeding; an opiate draught at night. 9th.—The penis less swelled and painful; the discharge no longer sanious nor fetid, but a thin pus. An opening draught, and afterwards a saline draught every six hours; an opiate at night.

10th.—Occasional severe pain during the night, with intervals of ease; the penis still red, and very tender to the touch. I slit open the prepuce, of which the internal surface was inflamed and partially ulcerated; the sore of the penis was larger, presenting an excavation that would hold a filbert; a loose, black slough lay in it; the discharge puriform, not discoloured, but very fetid. Frequent tepid ablution; poultice of bread and water.

11th.—Much easier since the division of the prepuce; the lining of the latter and the glans present several ulcerations, with ash-coloured surface. As these did not exist originally, they must be referred to the active inflammation of the affected parts excited by the primary affection. In the same way a syphilitic sore behind the corona glandis not unfrequently causes inflammation, excoriation, and fetid, puriform

discharge from the glans and prepuce. The original sore is large and deep, the slough having separated.

14th.—The process of granulation is advancing, and the ulcerative excavation is lessened. The secondary ulcerations, and the incision of the prepuce are healing; all swelling has subsided, and the pain is at an end. 18th.—The sore is cicatrizing rapidly. Poultice discontinued; dry lint; a draught of infusion of cascarilla, with dilute sulphuric acid, three times daily.

December 12th.—The sore healed soon after the last date, and the patient went out of town. The parts are now in a perfectly sound state, the loss of substance in the glans appearing much less than at the time; and the general health and strength are perfect.

This case occurred several years ago. I have seen the subject of it from time to time, and know that no constitutional symptoms ensued.

The cases now related show that the venereal poison may cause mortification, either simple loss of vitality or the state called sloughing phagedæna, as its primary effect; and that high inflammation of the surrounding parts, particularly of the glans and prepuce, follows more or less quickly as a secondary consequence. The treatment consists in depletion, general or local, or both, with other antiphlogistic means; and in division of the prepuce when it has become inflamed. The propriety of the latter measure is indicated by general swelling, redness, and severe pain of the penis, with fetid, ichorous, or sanious discharge from the orifice of the prepuce. The latter part will soon slough, if local relief is not procured in the manner now indicated. The division of the prepuce, however, is of great advantage in checking the progress of sloughing chancre on the glans, even where that part is not considerably swelled, nor in the state of phimosis, as you see

from the foregoing cases. In this rapidly destructive and formidable complaint, mercury is unnecessary; its free exhibition would probably be most injurious. I do not think it necessary to detain you on the minor points of treatment, such as the occasional use of anodynes, the variations of local treatment according to the state of the ulcer, the diet, the administration of tonics and restoratives when the progress of disease has been checked; the particular indications in each case will direct your conduct in these matters.

Case of sloughing chancre in a young female.—The cases which I mentioned to you in a former lecture, of sloughing as the primary effect of the venereal poison, were all in males. We have now in the hospital a girl of sixteen, whose case is interesting in reference to the natural history of syphilis, showing that the venereal poison may destroy the vitality of the part to which it is applied, without exciting surrounding disturbance, or disordering health. Sarah Woodruff, to whose case I have already referred at p. 393, was servant to a family in Goswell street. She went out in the evening with two females older than herself, and passed the night with a man, with whom she represents that she had sexual intercourse for the first time. This happened a few days before she came to the hospital. On her admission she had a slough at the right side of the entrance of the vagina; its longest axis was nearly an inch. There was no material inflammation or swelling of the surrounding parts, and little or no pain. The slough was bounded by a line, at which the process of separation had hardly begun. The appetite and sleep were unimpaired, the circulation undisturbed, and the girl appeared in perfect health. She was confined to bed, the part was poulticed; and no medicine administered, except an occasional aperient. The

separation took place favorably, the depth of the mortification being at least one third of an inch, and the surface healed rapidly, a little discharge from the vagina remaining after the cicatrix had been completed. The patient is now ready to leave the hospital. The story told by this female was corroborated by the state of her sexual organs, which were healthy, except at the mortified part. The gangrenous affection was not referable to irritation from excessive coition, nor to any constitutional unhealthiness; it must be regarded, therefore, simply as the local effect produced by the application of an animal poison. The influence of the virus must have been exhausted in the destruction of the part; the subsequent processes of granulation and cicatrization were performed as healthily as in the case of slough caused by any other agency. The symptoms are more severe when this affection occurs in the male, where the suffering seems to arise principally from the pressure of the inflamed prepuce on the inflamed glans, and is immediately relieved by dividing the prepuce. This aggravation of the mischief does not occur in the female, where the parts are free from all pressure. The cases formerly related show, that in the male as well as in the female the operation of the virus is arrested by the occurrence of mortification; the dead part is cast off, and no further noxious agency is observed.

CHAPTER XIX.

VENEREAL DISEASES—GONORRHŒA.

The disease, which bears the technical name of gonorrhœa and is familiarly called clap, is an inflammation of the mucous membrane of the urethra or vagina, attended with puriform discharge which possesses infectious properties, being capable of communicating the disease by contact to the mucous membrane of these organs in a healthy person. Thus gonorrhœa is an infectious disease, conveyed from one individual to another usually, but not necessarily, by sexual intercourse. It is often mentioned with the epithet virulenta, not because it possesses peculiar violence of symptoms, but to designate it as the effect of a virus or poison, and thus to contrast it with gonorrhœa benigna, which depends on ordinary causes. The etymological signification of the term gonorrhœa might lead to an erroneous opinion respecting the nature of the affection, and particularly of the discharge. Gonorrhœa, which is derived from the Greek, is equivalent to the Latin *fluxus seminis*, that is, discharge of the seminal fluid. It is perhaps hardly necessary to state, that the discharge which takes place from the urethra in gonorrhœa is not of that nature, that it is an increased quantity, with alteration in the quality, of the natural mucous secretion of the part, caused by the state of inflammation in the membrane.

As a more appropriate name, some foreign writers have called it *blennorrhœa,* which means excessive flow of mucous fluid; however, the term gonorrhœa is too generally received and understood to render change of name advisable.

I had occasion to speak, in describing syphilis, of what is called the *poison* or *virus,* that produces the disease; and in the same way we recognise the existence of a similar cause in gonorrhœa. It is a question whether these two diseases, syphilis and gonorrhœa, are produced by one and the same cause, or whether they owe their origin to different poisons. We know nothing of the venereal virus considered in the abstract, and we know as little of that which causes gonorrhœa, that is, we do not know the particular ingredient or quality in gonorrhœal discharge, or in the secretion from a syphilitic sore that is capable of producing the disease in another person; we only know that a certain fluid, called gonorrhœal discharge, and the secretion of syphilitic sores will produce such effects. The question, then, respecting the identity or diversity of these two poisons, comes to this, whether two things, both of which are entirely unknown to us, be the same, or different. How can we answer such a question? It would be more clear, and more susceptible of an answer, in this form, whether gonorrhœal discharge be capable of producing syphilis, and whether the secretion of a syphilitic sore be capable of producing gonorrhœa. It is thus reduced to a question of fact, which would seem to admit of easy answer. If we see two effects that are perfectly similar we naturally infer that the causes are similar or identical. On the other hand, effects totally dissimilar are referred without hesitation to dissimilar causes. How does the case stand, then, in respect to the present question? Syphilis consists of ulcers, followed by a train of extensive diseases in various parts of the body, occupying long

periods, sometimes several years. In gonorrhœa there is inflammation of the mucous membrane of the urethra or vagina, without breach of surface. This is more considerable in extent than the syphilitic ulcer; it goes through a certain course, coming to a natural end, being confined to the parts first affected, and not in general attended with further influence on the constitution. These two diseases seem totally unlike, and the inference that naturally presents itself to the mind from contemplating the subject in this view would be, that they owe their origin to causes essentially different.

They who believe that syphilis first arose about the time of the discovery of America, are still of opinion that gonorrhœa existed before that time, and that it was an old disease. We should have supposed that persons holding that opinion would think that gonorrhœa depended upon a poison different in its nature from that of syphilis. For if gonorrhœa existed from ancient times, and the poison that produces it is the same as that of syphilis, how did it happen that syphilis had not existed as long as gonorrhœa? The belief in the identity of the poison is incompatible with the notion that gonorrhœa is an ancient affection, and that syphilis is one of recent date. However, we see that some persons who believe in the recent origin of syphilis are still of opinion that the poison producing the two diseases is the same. This was the case with Mr. Hunter. He was a great advocate for the identity of the poisons; in fact, he asserts that they are the same, and that the difference between the two diseases arises merely from diversities in texture of the parts to which it is applied; that is, if the poison come in contact with a mucous surface, such as that of the urethra or vagina, it causes gonorrhœa; if with a surface covered by cuticle, it produces syphilis, primary syphilitic sores. If this were the only difference in the two cases, it appears to me, in the first

place, that we should expect to find females, when venereally infected, labouring almost invariably under gonorrhœa, and very seldom under syphilis, because in them the poison is necessarily applied to the surface of the vagina in every case. It may come in contact with some external parts of the genital organs, but not necessarily so. We do not, however, find that gonorrhœa exists in much greater proportion in females than syphilis. Then, on the other hand, we should expect to find that syphilis would be found much oftener in men than gonorrhœa, because the poison is applied in them to the external surface of the penis, prepuce, or glans; and it seems rather difficult to account at all for the introduction of the poison into the male urethra, yet gonorrhœa occurs very frequently in males. If the two poisons are identical, gonorrhœa and syphilis ought often to coexist, because in many instances the poison must be applied both to secreting and non-secreting surfaces. We do sometimes find the two diseases existing together, but this is comparatively rare.

Mr. Hunter attempted to bring his opinion to the test of direct experiment, and introduced by puncture with a lancet the matter of gonorrhœa into the glans penis and prepuce. He has given a long account of his experiment, the result of which was chancre in the part, and subsequently sore throat, nodes, and so forth. If we should receive this experiment as conclusive, it would be decisive of the question, as it would unequivocally prove the production of syphilis from the introduction of gonorrhœal matter into a wound. I can only say that in the narrative there are so many inconsistencies, that, in spite of the high authority of Mr. Hunter, I must withhold my belief; and I am encouraged in so doing by the fact, that attempts to produce primary syphilitic sores from gonorrhœal matter, and to produce gonorrhœa from the

discharge of syphilitic sores, have totally failed in other instances. Mr. B. Bell, of Edinburgh, made several experiments for both of these purposes by inoculating gonorrhœal discharge on the glans and prepuce with a lancet, which produced no effect whatever, and applying in the same manner the secretion of primary syphilitic sores to the vagina and male urethra. When the secretion of a chancre was introduced by a small puncture into the surface of the male urethra, chancre was produced, chancre which led to the occurrence of secondary symptoms, and required a long course of treatment for their cure. Here I may observe, that Mr. Hunter's statement that the application of syphilitic matter, either to the vagina or urethra, that is, to a secreting mucous surface, will produce, not ulcer, but discharge, is not strictly correct. For we find, not very frequently indeed, but so often that it is perfectly well known, that chancre may take place within the orifice of the male urethra, and a troublesome thing it is when it occurs there. We also know that chancre may take place at the entrance of the vagina. The urethra and vagina are both susceptible of the occurrence of syphilitic ulceration.

The general result of our experience leads to the opinion that gonorrhœa and syphilis are essentially distinct in their nature; that the poison producing the two must be different, and that there is a greater difference between the affections than can be accounted for simply by diversity of texture in their respective seats. I consider them as essentially different in their nature, and cannot doubt that the causes which produce them must be equally different in some important points.

Although, however, the result of the trials by inoculation seem almost conclusive against identity of the poison in the two cases, while the consideration that mercury, so efficacious in syphilis, possesses no peculiar influence on gonorrhœa,

supports the same view, there are arguments worthy of attention on the other side. Both complaints are contracted in the same manner, and vaginal discharge often leads to primary sores in men.

This is ascertained unequivocally by the periodical examination of public women in the large cities of the continent. Ulcers are rare among them, but discharge from the vagina is very common. Syphilitic sores are frequent enough among the soldiers who cohabit with these women. Again, of different men having intercourse with the same woman one has had gonorrhœa, another syphilis, while both affections have sometimes been contracted from the same source. Gonorrhœa is sometimes, but not often followed by secondary symptoms in the throat, and more particularly not distinguishable from those of syphilis. There is a gradual transition from one complaint to the other, as in the case of other nearly allied affections. The simple excoriation of syphilis and the gonorrhœa præputii with its patches of denuded surface approach to gonorrhœa, especially when that is accompanied with inflammation and excoriation of the glans and prepuce. These milder primary affections may be followed by formidable secondary disease.

An interval of time elapses between the application of the infection and the occurrence of gonorrhœa. This is usually shorter than in the case of primary sores, but it may be protracted for some weeks. The discharge generally begins from three to ten days after infection; it may appear earlier than the first, or later than the second of these dates; and it may be still further protracted under special circumstances. I was informed by a friend that in his youth he had intercourse with a female in a field. He caught cold by the exposure of his person in this open-air amour, and suffered a severe attack of rheumatism. As he was recovering, and on

the thirtieth day after the connexion, gonorrhœa broke out.

In the first place, a slight degree of heat and uneasiness is experienced at the orifice of the urethra; the lips of the opening swell and become red, and then the discharge shows itself. A thin, yellowish fluid issues from the urethra, increases in quantity, and becomes thick and yellow, sometimes having a greenish appearance. The pain and uneasiness increase in proportion as the discharge increases. Together with these symptoms, an unpleasant sensation is experienced in making water. The passage of the urine over the inflamed surface of the urethra produces a sense of burning and scalding technically called ardor urinæ, and the increased secretion flows copiously from the canal. The symptoms increase in violence and last for a certain time; they then begin to lessen, the pain subsides, the discharge diminishes in quantity, till it goes away altogether; and thus gonorrhœa, if left to itself, will pursue a certain course, and disappear entirely, this process occupying perhaps four, five, or six weeks. Sometimes, instead of disappearing entirely, the discharge diminishes in quantity, has a less bright colour, and sometimes even becomes colourless. The scalding in making water is lost, and nothing remains except this increased secretion. In that state the complaint may go on indefinitely, under the name of gleet.

But persons who contract this disease do not often get off so easily. What I have described is a mild specimen of the affection, a sort of middling case. Frequently the inflammation is more considerable, the glans penis swells and becomes of a bright-red colour and painful; the lips of the urethra are particularly tumid and red; the prepuce swells, becomes œdematous, and sometimes passes into the state of

phimosis, while, at the same time, the inflammation extends along the urethra and may even reach the bladder. There may be an admixture of blood with the discharge, alarming the patient, but not attended with any danger. In the milder case it is found by examination that the inflammation of the urethra does not reach further than about one inch and a half or two inches from the orifice, and Mr. Hunter calls this the "specific distance." He seems to have an idea, that in the infectious disease, properly called clap, the inflammation would not reach beyond the point I have mentioned, if properly managed. However, the inflammation by no means observes this boundary in all cases; it often goes beyond the specific distance which Mr. Hunter described, and runs along the urethra into the perinæum. In these cases there is severe pain of the urethra, extending to the perinæum, and frequently affecting the groin, testicles, inside of the thighs, front of the abdomen, and region of the bladder. There is frequent desire to make water, which passes with difficulty and pain, often of the severest kind. The patient also experiences painful erections, especially in the night. This symptom usually occurs in clap to a greater or less degree. The erection is often accompanied by an incurvation of the penis, which is bent downwards, as if confined by a string, and hence called chordee. The curve, being only temporary, cannot depend on any permanent change. It may probably be considered as of spasmodic nature, being relieved or prevented by opium. It would seem not improbable that fibrine might be effused into the corpus spongiosum urethræ when the canal is violently inflamed. This would cause thickening and some change of figure.

In a still more serious form of the affection, when the inflammation extends to the bladder, there is most severe pain

in the region of that viscus, in the perinæum, and along the penis, extending to a greater or less distance all around; the patient is tormented by an incessant desire to void the urine, and the act of doing this is excessively painful; the ardor urinæ is increased to an almost unbearable degree; and inasmuch as the mucous lining of the urethra is swelled, from the state of congestion in its vessels, the canal is diminished in caliber, so that the urine comes out slowly, and the pain in discharging it is proportionally augmented. This difficulty in discharging the urine may proceed to such an extent that it comes away only by drops, or there may be complete retention. It also happens occasionally that the over-distended vessels of the membrane give way, and blood escapes. This is rather a favorable occurrence, as it tends to relieve the turgid vessels of the inflamed membrane.

Such are the circumstances that characterise gonorrhœa in its worst form. When the inflammation occupies the whole length of the urethra and involves the prostate and bladder, there is hardly a more painful disease, or one altogether of greater distress while it lasts. Then other cases, again, are particularly mild; they trouble the patient with very little pain, and there is only a slight uneasiness in voiding the urine.

Treatment.—An effectual, speedy, and safe mode of arresting gonorrhœa is still a desideratum. The discovery of such means would be highly interesting to many persons, to medical and indeed all other students. As yet we are not able to diminish very much the force of that moral lesson which the suffering involved in this complaint is calculated to convey.

The treatment may be considered either as rational or empirical. When we proceed to treat it rationally, or according to principle, we deal with it as an inflammatory complaint, and employ treatment, suited in activity to the degree of the

symptoms. In some of the serious cases that I have mentioned it might even be necessary to take blood from the arm, or from the loins or perinæum, by cupping or leeches, and then to administer purgative medicines, followed by diaphoretics, such as salines, with antimony. The patient must be kept at rest in the recumbent position, and confined to low or mild diet. Mucilaginous drinks, such as barley water, linseed tea, gruel, and gum-arabic water, should be freely taken, to dilute the urine and render it less stimulating to the urethral mucous surface. Alkaline remedies are capable of assisting in this object, particularly the liquor potassæ, which may be given in the drinks just mentioned. The best way to relieve the scalding is to give a moderate dose, about twenty drops, each time after the patient makes water. If given at distant intervals, the effect on the urine is lost, but if administered regularly, immediately after making water, it will have an effect on the secretion before the next time of passing the urine. Pain remaining in the urethra and bladder after these preliminary means will be relieved by the warm bath, the hip-bath, or effective fomentation. At the same time Dover's powder or opiates should be resorted to in sufficient doses.

If considerable and troublesome irritability of the bladder still continues, opiates may be advantageously employed in the form of clyster. Twenty minims of Tinctura Opii or more may be thrown up in three or four ounces of thin starch or mucilage, preferably at bedtime, and often with more relief than if opium were taken into the stomach. This method may be resorted to with advantage when uneasy sensations in this quarter remain after the complaint has been removed in all other respects.

If in a severe case of gonorrhœa the urine should only be discharged by drops, or there should be actual retention, the

catheter must be resorted to. An instrument of middle size should be used. A large one could not be introduced, and the point of a small one would catch against the irregularities of the inflamed and swollen membrane. The use of the instrument is likely to be attended with bleeding, which may be copious; it will relieve the inflamed membrane.

The chordee and nocturnal erections, which often interfere seriously with rest, may be prevented by a dose of camphor and opium at bedtime. Four grains of the former and half a grain of the latter may be taken in a pill, or the camphor rubbed up with sugar may be taken in Mistura Amygdalæ with Tinct. Opii ℥xx.

Small swellings, with more or less pain, are occasionally found on the under surface of the penis in the course of the urethra, and are probably, as generally supposed, inflamed mucous lacunæ. These disappear without any special treatment. Suppuration of such an enlargement is rare. When the disease is very violent, especially in a young subject of sanguine temperament and full habit, abscess may form in the perinæum, requiring an early and free opening.

In milder cases a gentler kind of treatment may be adopted, emptying the bowels, keeping the patient quiet on moderate diet, giving him nitre with supertartrate of potash, and mucilaginous drinks. In inflammation of the penis patients experience relief from the steady application of cold and frequently bathing the part. Sometimes more benefit is experienced from the use of warm fomentation or poultices, or from steeping the penis in warm water. When the pain of micturition is very severe, it may be lessened by putting the penis at the time in water as hot as can be borne.

In the treatment of gonorrhœa we have the advantage of being able to apply remedies immediately to the seat of disease by injection into the urethra. Such injections make a

considerable figure in treatises on the subject, described and arranged according to their intended purpose as mucilaginous or emollient, sedative, stimulant, and astringent. The two kinds first mentioned, instead of soothing and relieving pain, will only irritate, and a similar effect in greater degree will be produced by stimulating applications to an inflamed mucous membrane; astringents, on the contrary, may be of service.

The proposal has been made, and extensively acted upon, to inject strong solutions of astringent substances into the urethra in the early stage of the affection, with the view of stopping the discharge, and thus cutting the disease short. A solution of nitrate of silver has been employed for this purpose, in the proportion of ten grains to the ounce. If this be thrown into the urethra at an early period, it may stop the affection. It may be observed with respect to these injections generally that it is not necessary to impel them into the urethra further than what Mr. Hunter has called the specific distance; and that, by pressure with the finger on the outside, you may prevent the fluid from passing further than this. I have not myself employed this method, and therefore can give no positive opinion on the subject. It has been much used in the army, where the patients are favorably situated for the employment of the treatment at the best time, namely, the earliest appearance of the symptoms, for its regular and effectual application, and the appropriate general management. As the application is powerful, and capable, if used carelessly and injudiciously, of aggravating inflammation and suffering, even to the extent of causing retention of urine, it should only be ventured on with caution. The injection should be made by the surgeon himself, and the patient during its employment should be kept quiet, avoiding all local and general excitement. Injections are used

most commonly after the more violent symptoms have been already relieved. We employ astringents in a milder form, as sulphate of zinc, sulphate of copper, nitrate of silver, the bichloride of mercury; of the first three, two or three grains to the ounce of distilled water; of the latter, not more than one grain to the ounce. The injection should be made three or four times in the day, and in many cases it quickly puts a stop to the increased secretion. In other instances it fails to do so, and in some cases it aggravates the symptoms, increasing the inflammation and augmenting the discharge. These astringent injections have incurred the discredit of giving a disposition to stricture in the urethra, and hence many practitioners never employ them. They may have that effect when injudiciously employed, but not when used with care and prudence.

In the empirical treatment of gonorrhœa we find that particular remedies exert a certain power over this complaint, although, from their properties, we should not have expected them to be beneficial in such a disease. One of these, a remedy of recent introduction, but, from the experience of its efficacy, much employed, is the cubeb pepper, also called Java pepper, *Piper cubeba*. This, given in large doses at the very commencement of the complaint, will frequently bring it to an end in a few days; and in other instances, though not completely arresting the complaint, will control the violent symptoms, so that the patient has simply discharge, without pain or ardor urinæ. For this purpose we give not less than two drams of the powdered pepper, three or even four times a day. The longer the complaint has existed before this remedy is used, the less likely is it to be effectual. The existence of active inflammatory symptoms is not a sufficient objection to its administration. Another remedy, more commonly and more judiciously employed after the

antiphlogistic treatment, is copaiba, balsamum copaibæ, which is given in doses of half a dram to a dram three times a day; it may be taken either by dropping it on moist sugar, or on a little water or wine, like castor oil; it may be administered in some mucilaginous vehicle or emulsion, or in mixture in which it is combined with liquor potassæ. After the employment of general and antiphlogistic means, the copaiba has a marked effect in bringing the inflammation to a close. Copaiba and the various astringent injections are the means most commonly employed in the protracted form of the affection, called gleet, in which even blistering the penis in the course of the urethra has been resorted to.

Copaiba and cubeb pepper are often given in combination, half a dram of the former and one dram of the latter; these quantities with half a dram of liquor potassæ and two drams of mucilage, in an ounce and half of camphor mixture or distilled water, may be given three times daily. The French have ingeniously contrived to enclose the copaiba in capsules of gelatine, by which the strong acrid and nauseous taste of the remedy is got rid of, although the more important irritating action on the stomach, with the offensive eructations and nausea, still continues. The attempt has sometimes been imprudently made to cut short an attack of gonorrhœa by large doses of copaiba. A young surgeon with whom I was well acquainted did this. I do not know the doses he took. In addition to great disorder of the stomach and intestines, there was a most extraordinary and painful irritation of the kidneys and whole urinary system, with such change of the secretion that it could not have been recognised as urine. This great disturbance and suffering went on, almost unchanged, for weeks and months, and although at last somewhat alleviated, led, I believe, to his death at an early age. With proper precautions as to dose, which should not exceed half a dram, and to general

management, the copaiba may be taken from the beginning of the disease; the solution of the sulphate of zinc, of two grains in the ounce, cautiously increased, may be combined with it. The injection may be used four times, or even oftener, in the twenty-four hours. The copaiba not unfrequently causes an exanthematous eruption, not unlike that of measles, without material pain or constitutional disturbance. It prevents perseverance with the remedy, and disappears when that is discontinued.

The structure and physiological relations of the vagina are altogether different from those of the male urethra, and it has no direct connexion with the urinary system. These considerations explain what might otherwise appear anomalous, namely, that copaiba and cubeb pepper have no influence over gonorrhœa in the female.

Gonorrhœal inflammation of the mucous membrane of the urethra runs through its course, and comes to a natural end, without entailing future ill consequences on the patient. There are, however, some instances in which secondary symptoms follow gonorrhœa, but they are so few that many practitioners have never seen a case of the kind, and hardly believe the possibility of such an occurrence. They, however, who have had the most extensive experience in the treatment of this complaint recognise the possibility of secondary symptoms from gonorrhœa. This is the case with Mr. Carmichael. He says it is sometimes followed by papular eruption, superficial ulceration of the tonsil, and pains of the joints and limbs; but that the symptoms under such circumstances do not require the employment of mercury for their cure, ordinary antiphlogistic treatment accomplishing all that is necessary. In this, as in most other secondary affections, the mild use of mercury is advantageous, if not absolutely necessary.

There are some other circumstances occasionally attendant on gonorrhœa which require to be mentioned. The disorder of the urethra may cause inflammation of the glands in the groin; but if you adopt the measures which the local complaint requires, and keep the patient at rest, you will not be much troubled by this symptom; at all events, its treatment is to be conducted upon ordinary principles.

The gonorrhœal inflammation of the urethra when violent spreads, not only backwards along the canal, but forwards to the glans, which swells and reddens, and to the lining of the prepuce, which becomes thickened and hardened, particularly at the orifice, which loses its elasticity, becomes contracted, and no longer capable of being withdrawn, so as to denude the glans. This condition is called *phimosis*. Local means must be used to reduce the inflammation, and with proper care the complaint is not serious in a case of simple clap. The inflammation of the glans and prepuce may increase, occupying the whole thickness of the latter, which becomes swelled, red, tense, and painful, in addition to the contraction of the orifice. The inflamed prepuce may slough to a greater or less extent, and the glans may be found, when exposed, to have ulcerated or even to have sloughed superficially. Such mischiefs may be prevented in an early stage by active means, such as leeching, cold lotions or poultices, with saline aperients and antimony. Careful and effective syringing with poppy fomentation or tepid water should be performed daily, to remove the gonorrhœal discharge and irritating secretions of the inflamed surfaces retained by the phimosis. If the inflammation should continue, the only way to prevent the more serious mischiefs to the glans and prepuce is to slit up the latter in its whole length, which gives immediate relief.

An opposite condition of the prepuce, called *paraphimosis*,

is incidental to gonorrhœa and to the inflammation and ulceration of syphilis. The prepuce, partially inflamed and tightened, is drawn back over the glans, perhaps with difficulty, and cannot be restored without pain. It is left in this state, either purposely or carelessly, with its sharp, cutaneous margin, in which the elastic tissue resides, pressing on the body of the penis, and soon deeply indenting it, as the glans inflames and swells in front. The indentation, which, if not relieved, soon becomes ulcerated, occupies the upper half of the penis, while in the lower portion, which is not subject to pressure, the lining of the prepuce pushes out in a state of œdematous swelling. The integuments of the penis swell behind, and the parts in front are thickened by inflammatory enlargement, so as to increase the depth of the indentation and to alter considerably the figure of the penis, of which the anterior portion is thrown into a curve with the concavity upwards, and a considerable deformity of the entire organ. The object of the surgeon is to restore the parts to their proper relative position, which will be accomplished by pushing back the glans and the œdematous prepuce, rather than by drawing forward at first the strictured portion of the prepuce, of which the position cannot be immediately altered. In order to reduce the bulk of the glans the penis is immersed in cold water, and steady pressure is then used to squeeze out the blood. The glans thus lessened is pushed downwards and backwards with the finger and thumb of the right hand, while the integuments of the penis are brought forward with those of the left. The object is soon accomplished in a recent case, but when the displacement has lasted one or two weeks, or even longer, more time and no inconsiderable force may be necessary. Success, however, will generally be accomplished by steady perseverance, but with much pain. It may be necessary to divide the stricture by means of a curved bistoury

and director passed under it through a small cut in the swollen integument behind the confined part.

When the case has been long neglected, and the parts have become swollen with inflammatory effusion, the prepuce and the coverings of the penis are agglutinated and fixed in their unnatural position, with strong curvature and great deformity of the part. Even here the recovery will take place slowly under rest in the horizontal position, with proper local and general management.

The irritation of gonorrhœal discharge frequently produces warts on the glans and the prepuce, and still more frequently in great abundance on the external organs of generation in the female. The parts are almost unavoidably besmeared with gonorrhœal or other discharge, which continues to irritate them, and thus an immense growth of warts frequently occurs about the orifice of the vagina, on the nymphæ, perinæum, and neighbourhood of the anus, the latter being so covered as to conceal the orifice of the intestine, while the perinæum and external organs are completely beset with them. The treatment of these growths has already been considered under the head of syphilis.

Swelled testicle; hernia humoralis.—Gonorrhœal inflammation of the male urethra, commencing at the orifice of the canal, to which the infectious matter must be immediately applied, soon passes along the canal to a moderate distance, and does not proceed further. Sometimes it creeps slowly along the canal, without causing much inconvenience, and reaches the prostatic portion, and affects, generally, one of the ejaculatory ducts, more rarely both. The vas deferens becomes inflamed, painful, and enlarged to the size of a writing quill, as may be ascertained by taking the spermatic cord between the thumb and finger, and thus communicates irritation to the epididymis, which inflames and enlarges.

Thus a considerable inflammatory tumour, apparently involving the entire testicle, is presented to our view in the scrotum. This swelling, which is at first painful, and perhaps considerably so, is worse when the patient is in the upright posture and using active exertion, while it may be easy in the recumbent position, more especially if supported by a suspensory bandage. When carefully examined, the swelling is found to be hard and painful behind, soft and free from pain in front. The painful part, about two thirds of the whole, is an inflamed and enlarged epididymis, while the front and painless portion is the body of the testis, unaffected, and generally surrounded by some serous effusion, probably poured out by the serous covering of the inflamed epididymis. The scrotum is unaffected unless the inflammation should be unusually severe, when the integument may be reddened, and even the cellular tissue thickened, so as to render the skin partially adherent to the swelling.

The treatment comprises confinement to the horizontal posture and light diet, the application of leeches, from four to eight or ten, to the inflamed epididymis, followed by fomentation and poultice, and the mild use of mercury, three or four grains of gray powder or blue pill three times daily. The mercurial part of the plan is advantageous by removing the enlargement of the epididymis speedily and effectually, and preventing that partial swelling and induration of the texture which often remain behind after careless treatment, not without fear that the tube may become closed in that situation, and the testicle be thus rendered useless.

Another treatment, of comparatively recent date, is that of compression by means of adhesive plasters, so applied as to cover the whole swelling completely and as firmly as they can be put on. The inflamed organ is insulated and made to project by drawing the sound testicle out of the way; it is

then firmly enclosed by strips of plaster, applied first from behind forwards, and then transversely. For the latter purpose a long strip may be wound round from below upwards. This plan, which offers so complete a contrast to the usual mode of dealing with an active inflammation, especially in its early stage, answers the intended purpose well; the pain is quickly relieved, and the swelling rapidly subsides. It is then advisable to renew the plasters. The patient should keep quiet, although he can support the upright posture, and is not necessarily confined. I have not ascertained whether this method is as successful as the other in removing all swelling of the epididymis. Cases have come under my observation in which, after compression had been at first apparently successful, the symptoms had returned, and other means were required. Such failure may have arisen from inattention and carelessness on the part of the patient. On the successful result of the other method, when properly conducted, I can speak with entire confidence.

Gonorrhœal affections of the eyes and joints.—In hernia humoralis disease extends backwards, by continuity of surface, from the urethra to the testis, and in the same way may cause disorder of the prostate or bladder. The mischief is propagated forwards in phimosis and paraphimosis. Besides these direct influences, gonorrhœa occasionally excites disease in remote organs, and that of serious character, which is not regarded as a proper part of the natural history of the disease, like constitutional symptoms in the case of syphilis. These effects come under the head of secondary or sympathetic affections, their origin and mode of production being obscure, as in many of that class. The incautious application to the eye of gonorrhœal discharge from another person, or from his own urethra, will produce acute gonorrhœal conjunctivitis, one of the most violent and

rapidly destructive inflammations to which the eye is subject. I have seen two or three instances in which it was brought on by persons labouring under gonorrhœa washing their eyes with their own urine, in obedience to a prevalent notion that the practice is good for sore eyes, and several similar instances are recorded. In other and more numerous cases we fail to trace the disease to any direct application of infectious matter to the eye, so that its occurrence must have a constitutional origin, the nature of which is not at present understood. In this affection vascular congestion, with bright redness of the conjunctiva, swelling of the membrane and of the subconjunctival areolar tissue, are carried to the highest point, producing chemosis and general swelling of the lids, with profuse discharge of yellow matter, not distinguishable in appearance from that which comes from the urethra in gonorrhœa. The inflammation quickly extends to the cornea, in which it causes sloughing, general or partial; interstitial suppuration, or effusion causing opacity; or extensive ulceration; various immediate effects which ultimately destroy or seriously impair sight. The only prospect of benefit is when the patient is seen in the early stage, especially before the cornea is injured. Energetic antiphlogistic treatment, with the use of mercury, may stop the progress or lessen the amount of the mischief. If the ring of chemosed conjunctiva could be completely excised before the cornea has suffered there would be a fair chance of recovery. I once did this successfully where one eye only had been affected. The patient, a medical student, in whom the disease had occurred from matter spurting into the eye as he was syringing that of a child labouring under acute purulent ophthalmia, was in a state of complete syncope when the operation was performed, and the excision was accomplished with perfect facility. This was before the introduction of chlo-

roform. The aid of that agent would now be resorted to, but even with that advantage the great swelling of the lids renders the proceeding difficult.

Gonorrhœal conjunctivitis sometimes occurs in a milder form, the symptoms being bright-scarlet tint of the membrane, with increased mucous secretion and little or no pain. The vascular congestion may be more active, with considerable yellow discharge; the cornea is clear, and the eye in no danger. There is a gradual transition from this to the more serious affection. If the cornea is not affected, and there is neither chemosis nor swelling of the lids, there is no danger, though local depletion, with other corresponding means, may be advisable, to prevent mischief. In the milder cases a dose of aperient medicine may be given, and followed by introducing between the lids a drop of the solution of nitrate of silver, of two grains to the ounce, once or twice daily. A single application often suffices.

A more serious affection is gonorrhœal inflammation of the sclerotica and iris. The vascular trunks lying between the conjunctiva and sclerotica are distended, and the anterior portion of the latter membrane becomes of a pink or purplish red. These changes are distinctly seen through the conjunctiva, which participates but slightly in the affection. There is severe pain in the eye, with sense of tension, and intolerance of light, with profuse lacrymal discharge on exposure. The inflammation soon extends to the iris, which loses its brilliancy, assuming a dull and deeper hue. The external redness is increased, the vessels of the conjunctiva being more distended. The cornea becomes hazy, and vision is more or less impaired. Nebulous opacity and speck of the cornea are sometimes produced. As the inflammation subsides, the iris recovers its natural colour, and vision is restored. This affection must be treated by free depletion,

general or local, or by both in succession, and by other corresponding measures. Four or five grains of calomel with one of opium, at bed-time, procure rest and abatement of the symptoms. Two grains of the former, with one third of a grain of the latter, may then be continued every eight hours; tepid local applications are the most comfortable. Colchicum may be used with advantage on account of the rheumatic symptoms which accompany the affection. I have known the same person to experience at different times, in consequence of, or in connection with gonorrhœa, both mild inflammation of the conjunctiva and this inflammation of the external tunics and iris.

The joints most frequently affected in gonorrhœal cases are those of the lower extremities, particularly the knee, in which the disease is obviously synovitis, more or less acute, as in rheumatism. The ankle and foot frequently suffer with the knee. Those of the upper extremities and back are occasionally involved. As in common rheumatism, the affection passes from joint to joint, or it may leave one set of articulations to appear in another, and may reappear in its original seat. There may be so much of inflammation and pain as to require leeching, fomentations, and poultice. Cotton wool is on the whole the most generally useful as an external application Nitre and colchicum are useful internal remedies, to which the moderate use of mercury may be added. The iodide of potassium is sometimes found advantageous. In the chronic stage blistering may be necessary. When a joint remains swollen and stiff, without inflammation, pressure by strips of plaster and bandage, or by India-rubber coverings, adapted to the joint, will be of service. Gonorrhœal rheumatism is frequently chronic, occasionally improving, and then relapsing, so that much caution is required respecting external exposure, and return to usual occupations

and habits. I was acquainted with a gentleman who had experienced three severe attacks, each of which lasted about eight months, and followed gonorrhœa. Seeing him some years after the last, I was surprised to observe how completely he had regained health and strength, although nearly all the joints had suffered on each occasion.

Rheumatic inflammation of the joints accompanies both forms of ophthalmic disease, when they take place in consequence either of gonorrhœa, or of other discharge from the urethra. In an officer who had twice contracted gonorrhœa, of which the symptoms were violent, rheumatic inflammation of the joints and inflammation of the external proper tunics of the eye followed on each occasion. After the second attack the pupil remained contracted and irregular, with adhesions to the capsule of the lens, and some opacity of that part; vision was greatly impaired. Inflammation sometimes exists at the same time in the urethra, the eyes, and the joints; in other instances these parts are affected successively.

The last-described inflammation of the eye is exactly the same as rheumatic inflammation of the sclerotica and iris, occurring independently of gonorrhœa. Both this and the mild purulent inflammation of the conjunctiva are to be regarded as rheumatic affections of the organ, excited by gonorrhœa, that is, they take place in individuals in whom the constitutional disposition is shown by inflammation affecting either the synovial membranes or the fibrous structures of several joints. Although the organs appear dissimilar at first sight, there is an analogy of structure between the parts, which suffer in the two instances, that is, between the synovial membranes and the conjunctivæ, and between the ligaments and fibrous sheaths and the sclerotica. Hence we need not be surprised at finding that the eyes suffer under

the influence of that unsound state of constitution which leads to these affections of the joints. That the essential cause of this combination of morbid phenomena is peculiarity of constitution, may be inferred from the repetition of attacks, and from the length of time for which some individuals are harassed by successive appearances of disease in various parts. In one case severe purulent ophthalmia occurred in August, 1822, and a similar one followed soon after, and in the following eight years six attacks of rheumatic iritis were experienced. In another case discharge from the urethra, without infection, occurred four times, then inflammation of the foot; three years after, severe inflammation of the chambers of the aqueous humour; then gonorrhœa and mild purulent conjunctivitis, followed by rheumatic inflammation of several joints; and afterwards severe inflammation of the sclerotica and iris. In another instance violent gonorrhœa was followed by acute inflammation of the external tunics; a second gonorrhœa excited, first, purulent ophthalmia, then acute inflammation of the external tunics, and subsequently rheumatic inflammation of several joints: two years after, severe rheumatism was brought on by cold. I saw a gentleman with gonorrhœa, mild purulent inflammation of the eye, and rheumatic affection of the foot and back; it was the fourth attack he had experienced of the same combination of symptoms.

The long course of severe suffering, which has so often originated in gonorrhœa, makes it advisable to avoid all attempts to stop the progress of the complaint in persons of rheumatic constitution. A gentleman who consulted me for a clap recently contracted, informed me that he had been in the same predicament three or four years previously, when the discharge soon stopped under the use of medicine which I had prescribed, and that he then suffered severely from an

attack of pain and stiffness in the back, having never experienced anything of the kind before ; he seemed, however, to have been visited occasionally by rheumatism in the limbs. I advised him to live quietly and moderately, keeping the bowels open, and to leave the clap to its natural course. He got tired of the discharge, and wished to take something for it, when I prescribed a mixture with copaiba. He took two doses, and then felt uneasiness in the back, which alarmed him. He left off the medicine, the pain ceased, and the discharge soon came to an end.

CHAPTER XX.

CANCER.

The affections hitherto described, with few exceptions, are curable; being attended in many instances with great temporary disturbance of the part affected, and often with more or less serious disorder of other parts; but they go through a certain course, subside, and come to an end, leaving the seat of disease in a natural state, or variously altered, still however not interfering further with health in other respects, and thus not endangering life. I proceed to speak of diseases, which entirely change or destroy the structure of the affected organs, spread to all the parts around, and cause, sooner or later, the development of secondary diseases in remote organs, deeply impairing constitutional power, and ultimately destroying life. These bear the formidable name of malignant diseases, which denotes but too truly their dangerous character.

Cancer, fungus hæmatodes, and melanosis, agree in possessing this destructive character, both as regards their primary seat and the life of the patient. This has led, not unnaturally, to their being described together as various forms of one disease in the article "Cancer," of the 'Dictionnaire de Médecine,' (en 21 t.), by Breschet and Ferrus; and the same course is followed by Recamier, in his 'Recherches sur le traitement des Cancers,' published in 1829.

At the period of these publications the two last-mentioned subjects were very imperfectly understood. As they became better known, differences so important were observed between them that they could not be included in one description without the introduction of exceptions and qualifications in such number as would make the account confused and uncertain. For practical purposes, therefore, I think it better to consider the subjects separately, in which plan they will probably be most intelligible to the student. I am aware that my colleague, Mr. Paget, who has studied profoundly the pathological relations of these diseases, having brought to bear on the subject an immense amount of direct observation and examination, with knowledge of all that has been done by other inquirers, has considered it best to throw all the malignant diseases into one group, under the generic name of cancer, which would include several species, perhaps exhibiting further distinctions as varieties. They who wish for full information will resort to Mr. Paget's lectures, in which they will find a lucid exposition of all that is known on the subject.

Cancer, carcinoma, scirrhous or hard cancer, is a peculiar morbid change of structure in a part, of which induration is the most striking external character. In its primary form at least, it is not seen as an adventitious production, that is a new and separate formation or tumour, but always as a disorganization of some part, often so complete that traces of the original form and composition can hardly be distinguished. Thus in the scirrhous lump of the female breast the natural structure of the part has disappeared, and a morbid growth has taken its place. M. Lebert, a patient and successful inquirer, characterises the change as a substitution. In this respect it offers a strong contrast to fungus hæmatodes, or soft cancer, which commences in the

great majority of instances as a new formation or tumour. The change of structure does not continue limited to the organ originally affected; it extends sooner or later to the immediately surrounding structures, and to the neighbouring absorbent glands. About the same time ulceration takes place in the indurated part. Secondary disease is now developed in various forms in internal and remote parts of the body. Pain, emaciation, and serious constitutional disturbance arise, until the patient sinks under the aggravation of the local symptoms, and of this cancerous cachexia.

The original induration, constituting the first stage of the disease, has been called *scirrhus* or occult cancer, while the ulcerated state is termed, in common language, open cancer. The technical term, *carcinoma*, derived, according to Blancard,* from καρκινος, cancer, and νεμω, *depasco*, properly denotes the ulcerated stage, though it is used in a more general sense as equivalent to cancer. Thus the essential character of the disease consists in the succession of these two states, the indurated and ulcerated, and in its destructive agency, both on the affected parts and on the patient's life. The character of hardness belongs to other affections; hence, as the term scirrhus implies merely a hard state, it has been applied to various diseased changes, which are innocent. It is still used in this general sense by Boyer, in his 'Traité des Maladies Chirurgicales.' The mere circumstance of hardness, however, is not sufficient to characterise a class of diseases; so that scirrhus, if used in this sense, would include affections totally dissimilar in their nature. Hence modern writers, in order to avoid confusion and mistakes, apply this term scirrhus to such hard disorganizations only as will become ulcerated, or by other extension of mischief destroy life.

Cancerous affections may be divided into primary and

* Lexicon medicum, sub voce.

secondary. The disease first appears in one organ, and afterwards, in a longer or shorter time, affects the absorbent glands and various internal parts. Those most subject to the primary attack are the female breast, the uterus, the rectum, the stomach, particularly the pylorus and cardia, the tongue, the lower lip, the female external organs of generation, the penis, and scrotum. The skin, the bones, and most of the viscera are less frequently the seat of the disease in its primary form. The testicle, prostate, and ovary, are not unfrequently enumerated among the parts subject to cancer: it occurs most rarely in these organs, if at all. The secondary affections are seen in the absorbent glands, the skin, in the thoracic and abdominal viscera, particularly the lungs and liver, and the bones. Although the absorbent glands of the first order, but not others, are invariably involved, sooner or later, they are almost exempt from the primary disease; I only remember to have seen such an affection twice, once in the axillary, once in the inguinal glands.

Instead of describing cancer generally, which would be vague and unsatisfactory, I shall take the female mammary gland as an illustration; the account of the diseased change, as it occurs in this organ, of its causes, its progress, varieties, treatment, and ultimate effects, will be applicable, with some modifications, to other cases of the disease.

Serious and formidable as cancer of the breast appears in the progress to its fatal termination, it begins in a mild and painless manner. This, which is called the indolent period of the complaint, is of various duration; it may last for weeks, months, or longer. A portion of the gland becomes firm to the feel, not enlarged, loosely connected to the parts around, and without adhesion either to the skin or the chest. Its presence is often detected accidentally, when it may have attained the size of a filbert or walnut. Being unattended

with pain it is supposed to be of no consequence, and is often neglected accordingly. To the question, how long it has existed, the patient often replies that she does not know, that it had attained the actual size when she first noticed it. The unaffected portion of the gland retains its healthy structure. More rarely the affection begins in the centre of the gland, under the nipple and areola, and gradually extends to the circumference. The surface of the growth may be uniform or uneven; it may be circumscribed, or connected more or less firmly to the healthy portion of the gland.

In speaking of the disease as first observed, patients commonly call it a lump in the breast, probably meaning to convey the notion that it is something new or additional, an enlargement or swelling. The expression cancerous tumour is often employed, both by patients and surgeons, in speaking of the disease in any state of its progress. It must not be understood from this language that the affected part is enlarged, for it may be diminished in size, and even considerably, whether it occupies the whole mammary gland, or is confined to a particular lobe. The bulk of the entire gland, when scirrhous throughout, is less than in the healthy state, and the diseased half of a breast is obviously less than that which is sound; the quantity of adipous substance in a voluminous bosom may conceal the difference.

Although the disease may begin in any part of the gland, it originates much less frequently in the centre, under the nipple, than in a particular lobe. The most frequent seat of its commencement is between the nipple and the axilla; the least frequent is on the sternal side. It may begin below or above, the former being perhaps the most frequent.

After some months, perhaps a year or more, the complaint passes into a more active state; the hard part is larger,

nearer to the surface, no longer easily moveable, but connected to the surrounding parts; sometimes there is slight general enlargement of the breast, with some warmth. The character of scirrhus is now clearly marked by incompressible hardness, with total want of elasticity. At this time there may be occasional pain, described as shooting or darting; or it may still be absent. The adipous texture around the disease is hardened, and thus the skin is drawn in, at first in so slight a degree that it might escape the notice of a careless observer. It may make a conspicuous, and even deep fold, in time, and is then found to have become adherent to the tumour. Sometimes it is reddened, thickened, and hardened, and slightly knotted on the surface; it may adhere extensively and closely to the scirrhous mass; it may become as thick as the sixth of an inch, without discoloration, but with loss of elasticity; and this change may extend to greater or less distance from the disease; the nipple sinks down, flattens, and becomes retracted. When the whole gland is involved, it is drawn to the bottom of a circular depression of the skin; in other cases the retraction is partial. In this more active state of disease there is generally increase of pain, which recurs more frequently, is more severe, and of lancinating character.

Another occasional, but not frequent affection of the skin, is the formation of cancerous tubercles in the neighbourhood of the original disease, and thence extending over the front of the chest, but seldom passing beyond that region, in which they are scattered irregularly, not in general numerous, except in some chronic cases which have lasted long. They vary from a size just discoverable by the feel to the third of an inch in diameter, and they may exceed that magnitude. They raise the surface but slightly, and occupy the cutis and the immediately subjacent tissue. Of a pale pink tint in the beginning, they gradually become bright red and

shining. At first unattended with pain, they may become a source of considerable suffering. It is important not to overlook their existence and extent, especially in reference to the question of operation. The most remarkable case I have seen in respect to the number and extension of these growths was that of an American lady, fifty years of age, in whom a growth as large as a hen's egg, which had never caused pain, had been removed, two years previously, from the left breast, by an eminent surgeon in New York, who said it was a cancer. The left breast, of which the diseased part only had been removed, not including the nipple, nor apparently any of the integument, was a uniform, scirrhous mass adhering to the chest, with a transverse cicatrix under the nipple adhering to the gland. The axillary glands formed a knotted, scirrhous swelling, not very large. Numerous hard tubercles, from the size of a pea to that of a horse-bean, were scattered irregularly over the chest, being most numerous on and around the breast; they reached to the opposite side, but there were none in the abdomen; there were some at the back of the chest, and two or three about the neck; they involved the skin, which was slightly reddened over several, but not all of them, and were not painful, neither was the breast. The eyelids, without being swelled, could only be opened imperfectly, so as to present a small slit. The cause was found, on close examination, to be the growth of a substance from the surface of the orbit, firm, incompressible, and closely adhering to the bone. This occupied both the upper and lower portions of the right, but the upper only of the left orbit. It was probably a cancerous growth, and allowed of the upper lids being raised only to a trifling extent. The lady had a cough of recent occurrence, to which she had not been subject previously. She had an unhealthy, sallow countenanance, and was very thin.

The absorbent glands in the axilla rarely, if ever, escape participation in the disease. They are sometimes affected early, sometimes later; one or two of them may be swelled from simple irritation, which may be expected to subside when the primary disease is removed. They gradually become enlarged and scirrhous. The morbid deposit, at first partial, is strongly contrasted with the proper structure of the glands, which soon disappears, the former being substituted for it. The whole set of glands is ultimately involved, forming a hard mass, which fills the axilla. At a later period there is swelling and induration of the glands above the clavicle. As the passage through the lymphatics to the thoracic duct is now completely intercepted, the upper extremity swells, sometimes becoming greatly enlarged. Of œdematous softness at first, it gradually becomes firmer, with redness, heat, and pain. In a large upper limb, this tumefaction may become very considerable, with active inflammation; and I have seen large suppuration, both in the upper and forearm. In rare instances œdema of the face, neck, and side, has been seen. The structures at the base of the disease become indurated, like those on the other surface, and thus fix it firmly to the great pectoral muscle, some fibres of which are involved in the mass, and must be removed in the operation. Small, separate cancerous deposits are sometimes found among the superficial fibres of the muscle. To this state of matters, in which the hard, original scirrhus, with the thick covering of indurated skin blended with it into one hard mass, which is firmly fixed to the chest, the popular name of stone-cancer is not inappropriate.

After the skin has become completely involved in the disease, either by adhering to the general surface of the mass, or being drawn to it in a fold more or less deep, ulceration may be expected to begin. It takes place in two

different forms; the one superficial and slow, with sparing discharge, which incrusts, the other rapid and deeper, with copious secretion.

In the former the ulceration may begin with a crack at the bottom of the cutaneous fold; a thin scab forms on a surface which is excoriated and raw; it falls off and is reproduced, often quietly adhering for a considerable time, without any pain, so that the patient hardly notices what has occurred. Sooner or later this becomes a superficial and painful ulceration. More commonly the ulcerative stage, instead of beginning to shew itself at first on the surface of the skin, seems to begin by change in the state of the scirrhous growth. A red or livid roundish prominence arises about the centre of the mass, at first hard, but gradually softening so as to have an elastic feel, the discoloration becomes deeper, and the part softer; it then ulcerates, and a thin ichor runs from it. In a large cancerous breast there may be more than one prominence of this kind. Sooner or later a large chasm may be produced by the combination of ulceration and sloughing, the latter being superficial and occasionally attended with bleeding; the bottom of the sore is irregular, sometimes with red elevations like granulations or with disorganized ash-coloured portions. The whole surface and parts around are of scirrhous hardness, the edges tumid and everted. Thus, though ulcerative destruction is going on in the centre, cancerous disease is continually advancing in the whole circumference. An ulcer of this kind does not secrete pus, but pours out a bloody, offensive ichor, often in great abundance. The discharge of the superficial ulceration is not fetid, it forms yellowish scabs in the early stage. Indeed, this superficial excoriation has sometimes dried up and healed, the scirrhous mass shrinking and lessening, but not disappearing.

The active period, in which cancerous disease is spreading to surrounding parts, is attended with pain increasing in severity and duration: the suffering described as a terrible pain, is aggravated and becomes constant in the ulcerative stage, in which the morbid state of constitution or cachexia, which has been gradually advancing, becomes fully established. The patient, worn out with suffering is anxious, with contracted features, pale and sallow, with a peculiar duskiness of countenance, to which the term leaden is sometimes applied. There is loss of appetite, with emaciation, accelerated pulse, and a kind of fever. The pain, which is constant, except when controlled by opium, is described as stinging or burning. Pains are felt over the body, in the spine, shoulders, and hips, and shoot with severity along the arm, which is sometimes motionless from great enlargement. Difficulty of breathing comes on, with harassing cough and pain in the side, and the patient sinks exhausted by this accumulation of miseries.

Organic changes.—When the part removed by operation is examined, we find that the substance of the mammary gland has been converted into a compact, dense, unyielding tissue, of peculiar hardness and toughness, so that we can make no impression on it with the handle of a knife. It has the firmness of cartilage, but is more tough. A thin slice has a degree of translucence. It is light grayish, or very light brownish yellow in colour, and homogeneous, excepting that it sometimes contains cells, and that it is occasionally interspersed with small white points and streaks which are probably remains of lactiferous ducts containing inspissated lacteal secretion. Under the microscope it exhibits an abundance of nucleated cells, which are considered to afford unequivocal evidence of cancerous character. The disease may appear as a distinct and circumscribed tumour; or dense cellular

bands may extend from it into the neighbouring cellular and adipous texture, which, although not diseased, is thickened, indurated, and closely adherent to the scirrhous mass. This change embraces also the skin and part of the pectoral muscle.

In old cases of extensive disease, this thickening passes in the intervals, of the ribs to the pleura and the peritoneum lining the diaphragm, which may be thickened and tuberculated. Morbid change of the same character as that of the original disease is found also in the absorbent glands. As the lymphatics of the mammary gland pass partly into the chest at the intervals of the costal cartilages, the small glands in the course of the internal mammary vessels are found to be scirrhous after death. White and firmish tubercles of various size, are found both on the surface and throughout the substance of the lungs and liver. The uterus is not unfrequently diseased, and tubercles have been seen on the external surface of the mucous membrane of the stomach and intestines.

In a patient of forty, who died in the hospital two or three weeks after admission, with active mischief in the chest in less than two years from the commencement of her disease, the whole right mammary gland considerably enlarged, was a mass of scirrhous hardness throughout, fixed to the side, with the skin tense, adherent, and with slight blush of red. The axillary glands, converted into a hard mass, filled the axilla. There was inflammation of the pleura, with seropurulent effusion and scirrhus of the cervix uteri.

A corpulent woman, of fifty-five, who had lived as a cook in a gentleman's family for many years, had the mammary gland removed in the hospital for a scirrhous growth the size of a walnut, which had begun within the year. She died

six days after the operation. There were two small polypi of the uterus; one a soft growth like a bit of flaccid membrane, connected by a slender pedicle and hanging into the vagina, the other of a firm texture and unequal surface, with broad attachment to the fundus uteri. The ovary was three times the size of the fist with several cysts. From the interior of the latter numerous soft reddish masses were growing. When cut into, they broke down under pressure, and a creamy fluid could be squeezed out of them.

The bones are affected with secondary cancer occasionally, not very frequently. Their solid materials are removed or lessened in amount, and cancerous structure is deposited instead. This generally happens in an advanced period of the disease and the constitutional cachexia is impending or has begun.

A female, about fifty, was under my care in the hospital, she was robust and in good health at the time of admission, but died after remaining a considerable time in the institution. Nearly the whole of the sternum was affected with cancerous disease, the osseous substance having in great measure been removed, and a dense, scirrhous texture deposited in its place which had caused an external swelling during life. The whole liver in this case was beset with whitish cancerous tubercles of various sizes, but not equal in firmness to the original disease.

I saw in August, 1843, a lady between forty and fifty, for whom a scirrhous tumour of the mammary gland had been removed in the country in the preceding December. She had been very ill after the operation, and had suffered ever since from severe pains in the shoulders, limbs, sides, and particularly behind the sternum. There was a cicatrix on the left mamma, of which one third had been removed; the rest of the gland was not diseased, but there was thickening under

the cicatrix, which was red. The axillary glands were enlarged and indurated. There was a general and undefined enlargement over the lower third of the sternum and the ensiform cartilage, extending to the sternal end of the cicatrix. It was painful on pressure; the action of the heart was disturbed, and the pulse much accelerated; the countenance sallow and anxious. That the sternum was enlarged by active cancerous disease could not be doubted, and the history made it probable that the affection had begun either previously to the operation or soon after it.

A single lady, twenty-nine years of age, had a scirrhous lump in the left breast, with enlargement and induration of two axillary glands. The latter and the entire mammary gland were removed by an hospital surgeon in the country, in September, 1842, after I had seen the patient. In April or May, 1843, a small, hard swelling had formed under the cicatrix, with pains in the back and chest, considered to be neuralgic. Paraplegia came on, with entire loss of power over the sphincters, and she died at the end of July. From the intelligent surgeon who had operated in this case, and who examined the body, I learned that the painful symptoms preceding the paralysis, which had been considered neuralgic, had come on in January. She had severe and varying, irregularly recurring pains about the shoulders and arms, so much augmented by moving them that she remained all day in one posture. Occasionally these symptoms were exhibited in the belly and lower limbs previous to the paraplegia, but were greatly relieved by the latter occurrence, and were wholly confined to the upper extremities, yet the lower were now and then affected with a peculiar pain, consequent on involuntary and abrupt catchings of the legs, while the true sensibility and power of motion were gone. The cicatrix was sound, and there was no disease in the axilla. A firm,

semi-transparent structure lay beneath the skin two inches below the cicatrix. There were small, cancerous tubercles in the liver. The three upper dorsal vertebræ were diseased, and a considerable angle resulted, without any pressure on the cord. The bodies of the vertebræ were compressed, and much of the bony structure was replaced by an elastic, semi-transparent, new substance, so that they could be readily cut with a knife. The plates of these vertebræ were much softened, and yielded readily to the chisel. The medulla of the cord was softened for two inches, but not disorganized. The sternum could be cut into, indicating plainly that a similar change had been going on here also, where, indeed, pain had been experienced occasionally.

There can be no doubt that the vertebral column had become affected with cancer in a lady between forty and fifty, for whom a tumour had been removed from the breast by Mr. Roux. The disease returned, and the entire mammary gland was excised by Sir A. Cooper. After some interval she became affected with paraplegia, and came under my care with complete loss of sensibility and voluntary power in both lower limbs, which were, however, frequently attacked with painful spasms. The sphincters were unaffected. She had good appetite and took food rather largely, and rested tolerably. There was a small hard knot in the cicatrix, which did not increase, and gave no trouble. She lived several months in this state, and at last died exhausted. The body was not examined.

In an old woman who had been affected with cancer for many years the thigh was broken simply by turning in bed. I saw her two or three months afterwards, when there was no attempt at repair. A woman about fifty, with cancer in the breast, which had ulcerated but was not painful, met with a similar accident, and came into the hospital under

my care. The general health was not affected. The broken thigh, treated in the ordinary manner, got well in the usual time. The humerus of a lady whom I had seen occasionally for a cancer in the breast, of slow progress, which had not interfered materially with health, had a fracture of the humerus from a sudden but not violent exertion of the limb. It got well in a little more than the usual time.

The symptoms and progress of cancer are not the same under all circumstances; they exhibit in some degree the same variety as most other diseases, in accordance with which they might be divided into acute and chronic. In the former there is greater vascular activity, with increased temperature, perhaps external redness, much pain, an elastic yielding on pressure, and a general enlargement or kind of hypertrophy, especially noticeable if the whole gland is involved. In the chronic form there is general shrinking and hardening, a progress towards atrophy. The majority of cases are more of this than the former character. The progress is more rapid in proportion as the patient is younger. Speaking generally, it may be expected to destroy life in three or four years, remaining in the indolent state for twelve or eighteen months, and then lasting for eighteen months or two years after.

I have seen it terminate fatally within a year, both with and without operation, as in the following cases.

A single lady, nearly seventy years of age, a remarkably fine, handsome, and healthy looking person, who had always enjoyed good health and led a temperate life, consulted me on September 29th, 1838, for scirrhus of the left breast, with enlargement of glands in the axilla, which she had first noticed in the previous July. The induration occupied the centre of the gland. There was no pain. The disease at first proceeded slowly, but afterwards advanced more rapidly, the

whole gland having become affected, the pain being constant and severe. Ulceration soon took place, and spread over a great part of the chest on the left side, with the severest pain, aggravated by sickness and general indisposition, and the patient sunk in April, 1839.

A lady of fifty, who had borne children, had ceased to menstruate, and had always enjoyed good health, accidentally perceived something hard in the right breast; it was free from pain. It was induration of a portion of the mammary gland. I removed the entire gland in February, 1827, six weeks after the disease had been first noticed; the affected portion proving to be a well-marked specimen of scirrhus. The wound healed favorably. Some months afterwards this lady fell off in health without any apparent cause, and she died in January, 1828, at her residence in the country, without any suspicion of the fatal illness having been connected with the disease in the breast. The liver, much enlarged, was filled throughout with cancerous deposits.

Another lady, fifty-one years of age, stout, hearty, and always healthy, who had borne several children and had ceased to menstruate three or four years, discovered a small lump in her breast about Christmas, 1826, and consulted me for it in February, 1827. It was of small size, loosely moveable under the skin. In March a gland as large as a filbert was observed in the axilla, and I removed the entire mammary gland. It was not easy to discover the absorbent gland by the feel. On dissecting it out I found the whole chain though not much enlarged, diseased up to the vessels. The wound healed favorably, and she remained well till August, when a return of disease began, which was quickly developed into the most general and formidable secondary affection that I ever saw under such circumstances. General swelling and induration occupied all the parts around the

cicatrix, the skin being thickened and hardened. This change extended across the sternum to the integuments of the left breast. The skin round the cicatrix was mottled with red, and painful, and a small, foul sore, yielding an offensive discharge, broke out. The absorbent glands above the clavicle were swelled and indurated. Another gland behind the angle of the jaw was in the same state. In September the swelling and induration on both sides of the chest was increased. A chain of large, hard knots extended from the right ear along the side of the neck to the clavicle. There was enormous swelling of the whole right upper extremity, with œdematous puffing in the right side of the face; there was great pain, yet the health was not much amiss. The skin on both sides of the chest, that of the right shoulder and side of the neck, was enormously swollen and of brawny hardness. The hard and swollen skin was hot and painful. Subsequently deep but not considerable ulcerations formed in the swelled parts about the breast and neck. Death took place suddenly, after a little affection of breathing and slight cough, before Christmas, 1827.

A healthy married lady of forty-seven, who still menstruated, observed a swelling in the breast in August, 1843, and although it was free from pain she took surgical advice. In January, 1844, it was a scirrhous induration of the left breast, occupying about one third of the gland. There was some retraction of the nipple; the skin was slightly drawn in and adherent; the breast moved loosely on the chest, and there was no disease of the axillary glands. About the end of January I removed the entire mammary gland, of which the diseased part was a specimen of genuine scirrhus. This lady having recovered favorably, returned to her residence in the country in the middle of February. She became ill in April, and I was then informed that

tumours had formed in the abdomen, which gradually increased to a great size, and she died in the course of the month. There can be no doubt that the fatal affection in this instance was seated in the liver.

A contrast to these cases is afforded by other instances, in which disease, sometimes of serious extent, has existed for several years without much pain or material interference with health.

I saw E. B—, a female of sixty-nine, tall, stout, and robust, with every appearance of health and strength, who had borne ten children. She had scirrhus of the right breast of eight years' duration. The original and principal seat of disease had been in the interval between the two breasts, of which the skin was thickened, indurated, puckered, and firmly fixed to the thoracic parietes. In the centre, for the space of half-a-crown, it was reddish, livid, knotted, and apparently disposed to ulcerate. There was, indeed, a little exposure of surface, and some thin, bloody discharge. The induration spread from this part into the right breast generally, affecting the sternal half more particularly. The breast was not enlarged, nor was there any defined tumour. It was general induration, particularly of the skin. In place of the nipple there was an excavation half an inch deep, red, and moist. No glandular affection could be traced in the axilla, though the arm and forearm were swelled and painful on exertion. She had begun to suffer pain in the central red portion. The health was unimpaired, the appetite good, tongue clean, countenance natural, and there was no loss of flesh.

In a lady of sixty, a small, spare person, with cancer of the right breast, which was smaller than the other, and more fixed to the chest, though still moveable, there was a diseased gland about midway between the breast and the axilla. The most striking feature of the complaint was a tucking in of the

skin just at the inferior margin of the pectoralis major, on the outside of the nipple, which was not retracted, although involved in the disease. The fold of the skin formed a deep cavity, three inches long, the surrounding integuments being puckered and drawn into large folds. The disease had lasted six or eight years, and had never caused pain. The drawing in of the skin had been noticed from the first.

The wife of an innkeeper in Surrey had well-marked cancerous affection, occupying the entire breast. The nipple was retracted, the skin adherent, and cutaneous tubercles had formed around. This disease had lasted twelve years, and ulceration had not yet taken place. She had enjoyed fair health, but died within a year from the time of my visit.

A patient died under my care in this hospital in whom disease of cancerous nature had existed for about twenty years. The whole of one breast had been destroyed, the parts having been removed by ulceration and absorption. The same affection had taken place and had nearly destroyed the breast of the other side also. All the front of the chest, from the clavicles down to the upper part of the abdomen, presented an indurated mass, of irregular surface, as hard as cartilage, adhering to the parietes of the cavity. When she first came to the hospital there was a large ulceration occupying the interval between the two breasts, with much pain and inflammation. The ulcer was in a foul state, but in other respects she was in good health, looking well, eating, drinking, and sleeping tolerably well. The application of leeches gave great relief, so that during two or three months in the hospital the sore almost completely cicatrized. She was out of the hospital some months, and returned labouring under symptoms of acute inflammation of the chest, of which she died. The disease had existed nearly twenty years. She was about fifty when she died, so that it had begun about

the age of thirty. There was very considerable thickening of the pleura and of the upper part of the peritoneum. It would seem as if this long-continued disease in the neighbourhood of these serous membranes had gradually extended to them by continuity, and produced considerable alteration of their structure, a sort of cancerous change, with granular and indurated surface. There was also in her case a cartilaginous thickening of the pericranium, covering a part of the skull, and a corresponding change of texture in the dura mater.

When the disease occurs in advanced age, it not only goes on slowly, but is attended with little suffering. It lingers on for years, and in many cases does not shorten life. I saw an old lady occasionally for some years with disease in the right breast. The mammary gland was hard and atrophied. The skin over the nipple was drawn in, making one deep, transverse furrow, and there were two or three others less considerable joining this. In the hollow of this furrow there appeared a reddish prominence, as if ulcerated, but it was dry. At the age of eighty-two, when the disease had lasted four years, this lady's health was excellent; she was strong and active, with fresh and healthy complexion.

In a female of seventy-six, lusty, with every appearance of good health, which she had always enjoyed, and not looking more than sixty, married, but not having borne children, there was a scirrhous induration of the mammary gland on the axillary side of the nipple. There was firm adhesion of the integument, drawn into a long and deep fold. The nipple was greatly retracted, being at the bottom of a narrow cutaneous funnel an inch in depth. The indurated mass was not adherent behind. The affection, which had existed for two years, had not impaired health, and had caused but little pain. There were occasional sensations of short duration, described as shooting or darting.

Causes.—The disease is sometimes ascribed to external injury, such as a blow, and in occasional instances we see the point clearly established, as in the following case. A robust and healthy married woman, about forty, still menstruating, and accustomed to eat and drink freely, received in July, 1828, an accidental severe blow on the left breast, from which she experienced considerable pain. Her medical attendant thought it necessary to bleed, leech, and use other active means, although there was no swelling at the time. A considerable and hard swelling soon formed, for which I saw her in October. Free and repeated leeching, with regulated diet, improved health, but had no effect on the part. Soon after, a small gland was found to be swelled in the axilla. I removed the entire mammary gland in December; it was scirrhous, with a large, irregular cavity in the centre, containing fluid. It was necessary to cut out the whole chain of absorbent glands, although their morbid change could not have been discovered before the operation; they were enlarged, hardened, and contained interstitial deposition. The wound united by adhesion. I saw this patient in 1832, perfectly well.

In the great majority of cases there is no assignable cause. The complaint must be referred to the spontaneous class, as its origin is not noticed by the patient, and its existence is only discovered accidentally. It may occur in two or more individuals of the same family, and then it will generally be found to have existed in persons of the preceding generation, so that we cannot help believing in the transmission of an hereditary predisposition, though we cannot even conjecture in what that consists. It may occur in those of excellent constitution and sound health, in whom hereditary predisposition cannot be traced.

Although cancer may originate and attain some magnitude

without attracting the patient's notice, and may go on for months without causing uneasiness in the part or the slightest interruption of health, it proceeds more or less slowly but regularly to involve nearer and more remote parts, thus undermining the constitution and establishing that general and painful unsoundness of constitution or cachexia from which death may be regarded as a welcome release. It must, therefore, be considered throughout as a constitutional malady.

Diagnosis.—The distinction between cancer and other affections of the breast is most important in the early stage, when it is the least easy. The age of the patient affords some assistance. Cancer does not begin either in other parts or the breast in the young; it is most frequent about the cessation of menstruation, from the age of forty to that of fifty. It is very seldom seen before thirty. Sir A. Cooper had seen two cases only, one at twenty-seven, the other at twenty-nine.

I had a patient in St. Bartholomew's for whom I removed both mammary glands in succession, on account of scirrhous disease, before the age of twenty-five. She recovered favorably from both operations, but did not live long after the last. The circumstances of her death were not known to me.

I have seen some other instances in which cancer of the breast has occurred before thirty. The most remarkable of these was that of a young lady, with whose family I was well acquainted. When I first saw her professionally, in the autumn of 1828, there was a small portion, about the size of a filbert, at the sternal edge of the right mammary gland, unattended with pain or inconvenience of any kind, the breast being perfectly natural and healthy with this exception. She then stated that ten years previously she had felt uneasiness in the part, which she ascribed to the pressure of a broad, steel busk, worn in the front of the stay; her mother had

noticed that she frequently drew the upper end of the busk outwards, apparently to lessen the pressure. She could not have been more than twenty-three at this time, and probably was not so much, as it was just at the period of leaving school. After a few months she told me that some alteration had occurred. There was increase of the affected portion, with some general induration of the mammary gland, as far as could be ascertained through a thick stratum of adipous structure. The skin was a little drawn in below the nipple, which was slightly retracted, and an enlarged gland was felt in the axilla. Alarmed by these indications of malignant character, I proposed that a surgeon, of the highest rank and character, since dead, should see the case. He at once pronounced the case to be innocent and free from all danger. She married in June, 1829, and went to reside in the country, where she enjoyed excellent health, saw much company, and led a very active life. When I saw her again, early in July, 1830, the breast presented an uniform scirrhous mass, with thickened and adherent integument, flattened and fissured nipple, with deep-red and shining prominence on its external side, and a superficial ulcer as large as a shilling, producing a thin, fetid discharge. I removed the whole mass, with a considerable area of the surrounding skin, which was still thickened in the course of the incision, and three or four axillary glands. The healing of the very extensive surface thus exposed, retarded by occasional attacks of inflammation, was not completed till the following April, having been effected at last under the influence of a large issue on the inner side of the arm. The cicatrization was, however, complete and firm, and the state of health satisfactory. Between one and two years afterwards, disease was discovered on the sternal side of the left breast, when she said that she was aware that the pressure of the busk had affected that as well as the opposite side, but

that she had not thought it necessary to mention the circumstance at the time of my first examination. This was soon developed into a general scirrhous state of the entire gland, which was freely removed, leaving an exposed surface of considerable extent, the repair of which had gone on favorably, but slowly, when it was interrupted by alarming head symptoms, of a nature to leave no doubt that organic disease had occurred within the cranium, under the slow increase of which the patient gradually sank.

In a lady who consulted me in the spring of 1832 for cancer of the breast, being then twenty-eight years of age, the disease had commenced two years previously. When I saw her there was scirrhus of the mammary gland, with the skin partially adherent to it, also a small, hard portion, the size of a nut, at the edge of the pectoralis major, and a single enlarged gland in the axilla. Two or three hard knots were observed in the skin, towards the circumference of the mammary gland. This lady, who had experienced great distress of mind from having been ill treated by her husband, was in a wretched state of health, so that an operation could not have been thought of, even if it had been otherwise advisable.

Although, therefore, cancerous disease may occur unusually early in rare and exceptional cases, there is the strongest probability that an affection occurring earlier than the age of thirty-five cannot be of that character.

The mammary gland, or chronic mammary tumour, is distinguished from the scirrhous disease in being a new formation or tumour, strictly so called; in appearing at an earlier age, for example, about twenty, before or soon after that time; in its looseness and mobility under the skin and upon the subjacent textures; in remaining unchanged for years, except, perhaps, in bulk; and in the absence of any extension to the skin or other neighbouring parts. I have

seen it of large size at the age of seventeen. It is as painful in its early as in the later stages, sometimes considerably painful, at others free from all uneasiness. It may arise in both breasts at once, an occurrence perhaps unexampled in scirrhus.

The soft feel of the swelling, and particularly the sense of fluctuation, general or partial, with slow progress, and absence of pain will generally enable us to distinguish cystic disease of the gland from scirrhus. When this point of diagnosis is doubtful, the use of the grooved exploring needle will generally decide the question. There may be a combination of apparently simple serous cysts, with scirrhous disorganization, the former being usually nearest the surface, and the latter lying deeper, although combined into one mass with the cysts. When the cancerous growth, having existed for some time, exhibits obviously its characteristic hardness, with irregularity of surface, drawing in of the skin, retraction of the nipple, and occasional darting pain, in a female from forty to fifty years of age, there can be little doubt respecting the nature of the affection.

Treatment.—The first question is whether the opinion generally entertained by the profession and the public, that cancer is incurable, is well founded or not. What is, or ought to be, meant by the cure of cancer? A cancerous disease may be removed by the knife, or it may be destroyed by an escharotic, and the part may get well, in the former case permanently, in the latter with great probability that it will soon reappear in the same situation, showing that the local cure has been only apparent. After removal by the knife the wound generally heals as in other operations, and in most cases the healing is sound and permanent. The patient may continue in perfect health for years, but the general result of experience is that disease takes place

sooner or later in other quarters, and ultimately destroys life. We can have no hesitation in stating that cancer cannot be cured, if that expression be considered to imply either the return of the diseased part to its normal or healthy state, or its passing into a quiet condition, without further influence on health, or liability to other and fatal manifestations of disease. The nearest approach to a cure of cancer is in the very rare cases of old persons, in whom the complaint, indolent throughout, has become quiet, the diseased part still existing, but having shrunk and causing no uneasiness; here, however, mischief may at any time arise in some other quarter, or death may ensue from some other complaint.

If the preceding view be correct, we shall not be surprised at finding that there are no remedies which have any just claim to be regarded as anti-cancerous. In the last century great faith was reposed in the virtues of hemlock (conium), chiefly in consequence of strong representations by a celebrated physician of the Vienna school. Its reputation has been long and entirely lost. The late Mr. Carmichael, of Dublin, wrote a book in our time extolling the power of iron in this disease. He gave the carbonate in the usual doses, also an oxyphosphate, which does not appear in the Pharmacopœia. He also used a phosphate and an arseniate of iron locally in ulcerated cancer, the former as a stimulant and corrective, the latter as an escharotic. The internal use of iron can be of no benefit in scirrhus, and probably would injure health in many instances. It may be of some advantage as a tonic in the state of weakness connected with the ulcerated period of the disease.

The late Mr. John Pearson recommended a reduced regimen, approaching nearly to starvation, as a means of checking the progress of cancer. We can readily believe

that irritation and pain may have been alleviated in some cases by a change of diet, not carried to the excess alluded to. Indeed, if a person of full habit, accustomed to eat and drink freely, in whom menstruation has recently ceased or has become deficient in progress towards cessation, should have incipient cancer or, still worse, carcinomatous ulceration, the regulation of diet and of constitutional health would be urgently required to check the progress of the mischief and lessen the amount of suffering from the advance of a complaint which cannot be cured. Solid animal food and stimuli should be entirely discontinued, the patient should be confined to such light and nutritious articles as do not excite, and should abstain from anything like strong exercise; the state of the uterus should be carefully attended to, as well as that of the alimentary canal and excretions, the local means being all of soothing character, with rest of the upper extremity on the affected side. In the advanced stage of the complaint, when the strength is reduced, the starvation plan could not be borne, and would certainly be injurious if persisted in.

Dr. Lambe published two books, in 1805 and 1815, in which he advanced the doctrine that cancer and other constitutional diseases might be cured by a simple vegetable diet, with the use of distilled water for drinking. The number of nutritious substances, including the various farinaceous articles drawn from the vegetable kingdom, is so great, especially with the addition of milk and eggs, which are not prohibited, that the vegetable bill of fare, in the hands of a skilful cook, is by no means deficient in variety or in well-flavoured and agreeable dishes. We can believe that it might often supersede with advantage the more stimulating articles generally considered necessary to keep up health and strength. I cannot believe that vegetable diet will cure cancer; and I know that it will not prevent its occurrence. I was acquainted

with a lady who had lived on vegetables for several years, at least seven or eight, during which she bore and suckled children, enjoying excellent health. While still on this diet she became the subject of cancer of the tongue; it was attended with the full usual amount of suffering, which could only be controlled by opium. One of the few instances in which I have seen cancer in the male mammary gland was that of a gentleman who had lived entirely on vegetables for a few years previously.

Some years ago a plan of treating cancer of the mammary gland by pressure was brought into public notice, with strong recommendations of its efficacy, as proved by actual experience. Long and broad strips of plaster were employed, being carried over the breast and the chest, and further supported by bandages. Diminution of bulk and of pain took place, and the most favorable anticipations of success were entertained. Not knowing how far the benefit extended, I conclude that it fell short of a cure, as the method gradually fell into disuse, and is now nearly forgotten. Dr. Neil Arnott devised a plan at the time for subjecting the whole surface of even an irregular mass to a perfectly equable compression. A patient with a small lump in the mammary gland, not of the most clearly defined character, was submitted to my observation before beginning Dr. Arnott's treatment and in the course of it. The disease disappeared in that case.

Putting the specific nature of the disease out of the question, we may find occasion for ordinary remedies in some of the various forms in which cancerous disease comes under our notice. We may check particular symptoms, lessen suffering, and thus palliate when we cannot cure. Determination of blood to the part, with heat, redness, and pain, may be relieved by a few leeches. Three or four may sometimes be applied with advantage in the neighbourhood of the

bosom once or twice a week for some time. If the uterus is uneasy, blood may be abstracted in this way from the neighbourhood of the anus. Poultice will sometimes be comfortable. Generally speaking, the softest cotton wool is the most agreeable covering, and maintains uniformity of temperature. Diet and general management have been already considered.

Much may be done to lessen suffering in the ulcerated stage. Simple poultice of bread or linseed is sometimes soothing; carrot poultice occasionally relieves. When pain is considerable, opiate applications to the surface often afford effectual relief. The Liquor Opii Sedativus, mixed with distilled water, is a convenient form for the purpose. Lint dipped in the lotion should be applied to the ulcerated surface, and covered with rag spread with simple cerate or with bread poultice, over which a layer of cotton wool may be placed. At first, the Liquor Opii may be one fourth of the mixture, the proportion being increased if the effect should be diminished by repetition. Opium may be applied to the surface in the form of ointment, one or even two drams of the powder being well incorporated with seven drams of lard. If the pain is considerable, whether with or without ulceration, the internal use of opium becomes necessary. This remedy, in whatever form, sometimes so disturbs the head or stomach, or both, that it cannot be continued. Here the hypodermic method of employing it comes in with great advantage. Ten grains of morphine should be dissolved in a dram of distilled water, so that six minims will contain one grain. It is sufficient to inject half of this quantity, that is, three minims. The injection is effected by means of a small syringe expressly calculated for the purpose. The fine tube through which the fluid is expelled terminates in a sharp point, which pierces the skin easily. The surgeon raises a small

fold of skin on the back of the forearm, makes a puncture at the base, and deposits the three minims in the cellular tissue. The sedative effect is produced sometimes in a surprisingly short time, it is complete, and it lasts for several hours, when it may be repeated. At first, even in a case of severe and continued pain, two injections in twenty-four hours will keep the patient perfectly easy. It may be necessary to make three or four injections within the same time as the remedy loses its effect. Another mode of employing opium, when its internal exhibition cannot be borne, is in the way of clyster. I was consulted in the case of a lady who had been suffering most intensely for a week or ten days from a formidable inflammatory affection of the eyes, by which one had become disorganized and protruded, while a similar fate seemed impending over the other. Opium in its several forms had not only failed to relieve, but aggravated the suffering in the head, which then became intolerable. I never saw a person in greater pain and distress. She had not slept for four days, and thought of the approaching night with a feeling of despair. At bedtime an enema was administered of three or four ounces of thin starch with twenty minims of Tinctura Opii. She passed a tolerably good night, with great diminution of pain, and slept a round of the clock on the following night after a repetition of the enema. She persevered in the plan for nine weeks, entirely free from pain, with such recovery of the eye as its damaged state would admit of, and an end of all alarm about the other.

The unhealthy condition and fetid discharge of ulcerated cancer are sometimes improved by charcoal poultice. The balsam of Peru, copaiba, carbonate of iron moistened with water to the consistence of a thin paste, and solution of lunar caustic from the strength of two to six or eight grains in

the ounce may be employed, either with or without poultice. The latter may be useful in checking profuse discharge, but the most efficient remedy, when the surface is extremely painful, is the chloride of zinc in solution of sufficient strength to disorganize the surface. By such an application pain is often effectually relieved, a healthy granulating surface is produced, and cicatrization may be effected, though the hard margin and base of the cancer remain. The preservative fluid of the late Sir W. Burnett is a saturated solution of chloride of zinc available for the purpose just mentioned, diluted at first with three or four times the quantity of water. A solution of this chloride, disguised by colouring matter, was the escharotic employed by an American quack, who made a profitable visit to this country, as a cancer-curer, some years ago. He boldly attacked the disease in its state of scirrhus, largely destroying the external coverings with strong nitric acid, so as to come to the surface of the disease, of which he produced gradual disorganization by his red fluid. When the mass was thus disposed of, granulation and cicatrization ensued, and the cure was said to be complete. No long time elapsed before the real nature of this so-called cure showed itself in cancerous thickening and hardening of the surrounding region.

As a means of removing diseased structure, the operation of excision appears to great advantage in comparison with the proceedings of the so-called cancer-curers, whether European or American. It is definite, certain, and far less painful. In the method by caustic an important part of the disease is left behind, as the scirrhous glands in the axilla cannot be got rid of in that way. There is a preliminary question whether operation is advisable at all, the performance of it having been sometimes subjected to conditions so strict as to approach nearly to a general prohibition. It cannot be

recommended as a permanent cure, since disease, though not of formidable character, may reappear in the neighbourhood from which the cancerous breast has been removed, and, what is more serious, secondary affections of internal organs come on inevitably, sooner or later, with the certainty of a fatal termination. The questions then remain, whether the operation may prolong life, and to what extent, also whether it may be of advantage in any other respects?

In the cases related at pp. 516 and 517, it will have been seen that death may follow in a short time, even after operations performed in an early stage of the complaint, on patients of sound constitution and in good health. On the other hand, after the operation, which is not dangerous, patients not unfrequently live in good health for some years, and this may happen under circumstances from which we might have been led to expect a different result.

I removed, in March, 1825, the entire mammary gland of a lady, forty-two years old, of spare habit, nervous and irritable temperament, for a scirrhous affection of moderate size at the upper part of the organ, without disease in the axilla. She continued perfectly well till February, 1829, when, after some pain in the shoulder and chest, a tumour of firm consistence, as large as a small walnut, with firmly adherent skin, formed at the axillary end of the cicatrix; a chain of small, hard tumours extended into the axilla; there was little or no pain. Her death, announced in the newspapers in March or April, was probably caused by internal disease in the chest.

I saw the patient, whose case is related at p. 521, in perfect health four years after the operation, and I heard indirectly a good account of her not less than two years afterwards.

In August, 1846, I removed the mammary gland of a lady, about forty, of spare habit, nervous temperament, and rather

delicate constitution, but usually enjoying fair health; she was a widow with one son. The tumour, of the size of a small hen's egg, was of twelve months' duration, and growing. It was on the outer side of the left mammary gland, which was naturally small, and it had not given much pain. The wound healed satisfactorily. The part removed was lobulated, the cut surface being granular, and found by Mr. Coote, who examined it carefully, to show many dilated ducts, dividing and subdividing which he discovered, by careful dissection, to be lactiferous tubes. Both Mr. Stanley and myself were struck with the resemblance which it bore to the so-called pancreatic sarcoma of Mr. Abernethy. She came to me in 1858 or 1859, in much suffering and anxiety, with the left side of the chest swollen generally, but more particularly in and around the situation of the cicatrix, the parts being deep red and firm to the feel; she could not use the left arm, which she had before moved freely. An American quack had used burning applications, which had given great pain, and made her very ill, but she was then getting better. She informed me that this had been done to remove a small knot which had formed under the scar. It was below the skin, and not painful, but it had alarmed her. The mischief gradually subsided, and she came to me again in 1860, when a part of the cicatrix, towards the axilla, had become indurated, and there were two or three hard knots under the neighbouring skin. I removed the parts freely, and she soon got well. In March, 1861, Mr. Coote excised some small cutaneous and subcutaneous cancerous knots which had formed in the cicatrix. She lives in the country, and I have not seen her since the last operation, but I have heard, from a near connection, that she is in good health at present (September, 1862). This case is important in more than one point of view. It teaches us that a primary affection of the

mammary gland, presenting, in the judgment of experienced persons, no character of malignancy, may lead to three relapses in the part not distinguishable from those which may occur in the most characteristic scirrhus. Secondly, it shows the advantage, in respect to the prolongation of life, of removing at an early period secondary formations of scirrhous character in the seat of the original mischief.

Another case, of still more striking character in respect to the first of the two points alluded to above, was that of a widowed lady, aged sixty, of healthy constitution and active habits, who had never borne children: she consulted me for a circumscribed and firm tumour, without pain, in the left breast, about the size of a hen's egg. Although she gave an unusually short date to the affection, I considered it to be most likely of scirrhous character, and that operation would probably be advisable. A high surgical authority concurred with me on the latter point, having grievously offended the patient by plunging a needle in the part without her previous consent, and the operation was performed in the beginning of April, 1847. This tumour, carefully examined by Mr. Coote, was of grayish, semi-transparent hue on a section, and lobulated so as to resemble closely the chronic mammary tumour. It was pronounced to be of perfectly innocent character, and that not the slightest apprehension could be entertained of any future trouble. The cure of the wound, although retarded by some untoward occurrences, was accomplished satisfactorily, and the patient perfectly recovered health and strength, resuming and enjoying fully her former habits, which had been very active. She left England in 1849, for an extensive tour on the Continent, and on her return from Italy, through France, she found a swelling in the bend of the right thigh, which she supposed to be a rupture. She consulted the late M. Roux, who advised her immediate

return to England, and I saw her when she arrived, in the beginning of February, 1850, when there was a firm and solid tumour in the bend of the right thigh, and a similar, but larger mass, within the abdomen in the immediate neighbourhood. Soon a second smaller tumour came in the right thigh, and another in the left inguinal region within the abdomen. She died early in May, the disease in the abdomen having attained an enormous size, but without any breach of surface.

The two following cases exemplify favorable results in the prolongation of life, by operation, when the circumstances of the case at the time of its performance were altogether discouraging. A lady, between forty and forty-five, had an induration of the left breast, which had come on gradually, and was proceeding slowly when I saw her. The part was not enlarged, but the mammary gland was scirrhous and knotted, but movable on the chest. The nipple was retracted, and the integuments drawn in at several points near the circumference of the gland. The axillary glands were hardened. The circumstances were too unpromising for me to recommend the operation, which, however, the patient determined to undergo after receiving all the explanations she required. It was performed in April, 1829, the entire breast, with its integument, being freely removed, as well as the axillary glands. The wound, although large, healed quickly and favourably. She went to the seaside to recover strength, and subsequently experienced some undefined illness, which gradually passed off. In August, 1830, I saw her in good health, and with a perfectly sound cicatrix. She continued well till June, 1842, when the abdomen had become enormously swelled with ascites, her health not having suffered more than it would have done from the incumbrance of the enlargement. The breast continued well, but there was a small hard knot

below the axilla, which had caused no uneasiness. It seemed clear that the liver was diseased, but, as she resided in the country, I do not know exactly how or when the case terminated.

A lady, between forty and fifty, underwent an operation in France on account of disease in the right mammary gland, of which a portion was removed, and stated by the operator, the chief surgeon of a large hospital, to have been a specimen of true scirrhus. The health was not much disturbed by the operation, the wound went on favorably, and seemed on the point of closing, when, in the fifth week, an unpleasant change occurred. It opened a little, and a thin, fœtid discharge took place, and the patient, alarmed by this occurrence, came off directly to England, and consulted me in the course of the sixth week after the operation. The lower third of the mammary gland had been taken away, apparently without any removal of skin. Nearly half of the cicatrix had reopened, the edges being somewhat hard, of a dull, whitish colour, without granulations, and the discharge thin, and of bad odour; absorbent glands were diseased in the axilla. The patient readily assented to my proposal, as the only safe and advisable course, that the remainder of the mammary gland, with the cicatrix of the previous operation, and the disease in the axilla should be freely removed, which was accordingly done in the summer of 1850. She was a widow, and married again about four years afterwards. I saw her from time to time, in perfect health, till 1860, when she left London for a distant part of the kingdom, and I have not heard of her since.

The sudden appearance of active disease in this case, consequent on an incision in a structure presumed to have been healthy at the time, was an occurrence altogether unexpected, especially when the wound of the operation had proceeded so favorably for four or five weeks. It offers a striking

contrast to what I once saw on a different occasion. It was that of a stout lady, with large bosom, in whom one breast was a uniform mass throughout of scirrhus, with adherent, but not discoloured skin. Near its centre there was a sound cicatrix, about an inch and a half in diameter. I found that this was the result of an application made by a person who had undertaken to cure the cancer. A large hole had been made by caustic in the mass, from which a thin and copious discharge had issued for a considerable time; this gradually diminished, and the part healed.

I could adduce other instances in which life has been prolonged for various periods, from four to ten years or more, by the removal of scirrhous mammary glands, but those now related are sufficient for the purpose.

The most favorable time for the operation is when the disease is in the indolent period, though frequently we do not see it till that time is past. If the breast has become fixed to the chest, if the skin covering and surrounding the gland is thickened and hardened, and if cutaneous tubercles are formed in the neighbourhood, the operation cannot be recommended. Disease of the axillary glands, which can be removed, and the commencement of ulceration, are not conclusive against operating, if the breast is loose upon the chest, and all diseased parts can be effectually taken away. To refuse operation is to pass sentence of death on the patient, and that of the most painful, distressing, and often lingering kind; few minds are strong enough to bear this. To delay and temporise, wasting time in treatment which is sure to be fruitless, keeps up a state of uncertainty and anxiety, with indefinite and exaggerated apprehensions of evil, which depresses the spirits, adding unnecessarily to the difficulties of the case, and often leading the sufferer to take refuge in quackery. I consider it a strong reason for

operating, particularly if the breast be large, that it prevents the possibility of death by ulcerated cancer, the greatest calamity that can befal a female. The operation is neither painful nor dangerous; the wound heals, and death may ensue after an uncertain length of time from some internal affection, not usually of much suffering or long duration.

The important point to be kept constantly in view in performing the operation is the necessity of taking away all parts to which any suspicion of morbid change can attach; the incisions should go beyond the extent of the disease, and this rule holds good in respect to the skin, as well as to the deeper seated parts. The advantage of saving integument enough to close the wound must give way to the imperative necessity of removing all that is diseased.

As scirrhous disease of the breast, in the great majority of cases, affects a part of the mammary gland only, and as this, in many instances which afford an opportunity of early operation, is a small part at the circumference, while the rest of the gland is perfectly healthy, it may be a question whether it would be sufficient to remove the diseased part, or preferable to take away the entire gland. Patients are naturally averse to the latter proceeding, as involving a painful mutilation, which surgeons also would wish to avoid, unless the other course, although recommended for choice at the time, as a comparatively trivial operation, should be found to be followed invariably by fresh disease in the gland, and the subsequent necessity of the larger operation. The rule on which I have acted for many years, and which I believe to be generally followed in this country, though not so elsewhere, is to remove the entire gland. In two instances, at least, I have found a small portion of induration at some distance from the larger mass, and so deeply situated that it could not have been discovered before the operation. Generally, however,

the disease is confined to one spot, the remainder of the gland being found quite healthy on careful examination after the operation. The two cases already related at pp. 507 and 536, illustrate in a most striking manner the importance of adhering to the rule I have now mentioned. In both the portion of gland removed was so considerable, having been in one equal in size to a hen's egg, in the other a third of the entire mass, that the operation could not have been much less serious than if the whole had been taken away, and the part left behind could not have been of any utility. The second case, at page 536, is most interesting in two other respects. The skilful surgeon who performed the operation could not have failed to remove all that was obviously diseased, yet mischief recurred, in a manner not to be mistaken, in five weeks. Again, with this evidence of active disposition to disease, it is very remarkable that the lady should have remained free from disease for so many years after the second operation.

A patient may sometimes be desirous of having a small bit removed, though unwilling to lose the entire gland. I took out a small portion of genuine scirrhus, hardly larger than a horsebean, from the circumference of the gland; the breast remained free for four or five years, when it was necessary to perform the larger operation. In a lady, for whom I cut from the border of the breast a lump about the size of a small walnut, disease returned in four years, being then accompanied with swelling of the axillary glands.

Small hard knots, to which in general the skin becomes gradually adherent, though they may be more deeply seated, occasionally form near the cicatrix, at some and possibly a considerable time after the operation. Sometimes undefined thickening and induration take place under the cicatrix, which is involved in the change, becoming red and uneasy or painful. As such occurrences unavoidably excite alarm and

anxiety, and the operation is trifling, it is best to remove the diseased parts, and to do it freely.

Cancer of the male mammary gland is of rare occurrence; its character and course being essentially the same as in the female. A gentleman, about fifty, stout, rather corpulent, and in good health, which he had always enjoyed, consulted me for a swelling of the left breast, which had existed for one or two years, without pain, until shortly before I saw him, when it was not very painful. It was a well-marked scirrhus of the mammary gland, with adhesion of the skin, but not to the subjacent parts; the axillary glands, apparently the whole chain, were enlarged and hard.

A gentleman, aged fifty-five, of spare habit, consulted me in August, 1832, for an ulcer in the centre of the left mamma, of irregular surface, without any disposition to heal. It was seated on a hard base, the surrounding skin forming a red margin, half an inch broad. There was a hard knot the size of a nut, with the skin adherent, between the breast and the axilla, and another rather larger in the latter situation. The health was good, and, except an occasional stinging sensation, there was no pain. This gentleman, who had lived ten years in the United States, had confined himself for nine years to vegetable diet, not on account of ill health, but from having read books on the subject. The disease had begun with a hard knot, the size of a filbert, under the nipple, which had been removed by Dr. Mott, of New York, with the nipple, in September, 1830. The ulceration had begun a year and a half after the operation; the discharge was sometimes offensive. In October, 1832, I removed extensively the original disease and the axillary glands, all the parts being truly scirrhous. The wound healed favorably, and the patient was soon quite well. At the end of May, 1834, he called on me, exhibiting all the marks of cancerous cachexia,

such as sallow countenance, loss of appetite, tightness across the chest, with short breath. The cicatrix was sound. A small knot, not hard, the size of a large pea, and quite loose, had formed about an inch below the cicatrix. He said that a similar one had appeared below the clavicle, and gone away. He did not seem to suspect that his illness was connected with the previous disease, and he died soon after without any fresh local appearances.

An Italian, about thirty-five, admitted under my care into St. Bartholomew's, had perceived a hard tumour in the right breast, fifteen months previously; in about three months it had ulcerated, and a fungus shot up. I saw him three weeks before death, when there was an ulcerated and fungous surface, two inches in circumference, on the right of the right nipple, which was sound. A mass of hard substance occupied nearly the whole anterior part of the right half of the chest; the skin was hard and fixed, and small tubercles were felt under it for some distance round the swelling, and the hard state of the skin reached into and filled the axilla. Hard tumours were felt above the clavicle, and the axillary glands on the opposite side were enlarged. The arm had become œdematous and respiration was affected, but the pulse and appetite were good, and there was not much pain or emaciation. He died in about three weeks. In addition to affection of the axillary glands on both sides; those of the right groin, and the entire chain up to the diaphragm, were found diseased after death, many of the internal glands being considerably enlarged. The right pleura and the peritoneal lining of the right side of the diaphragm were thickened. There was disease of the pancreas and both kidneys. A most striking and altogether novel character of this strange disease was that all the affected parts were of a bright yellowish green colour, being such a sight as I had

neither seen before, nor have seen since. The further details of the case will be found in the third volume of the 'Medico-Chirurgical Transactions,' p. 72.

Epithelial Cancer.—Such is the expression now employed to designate the disease, as it appears in the integuments and mucous membranes of the body. The characters of this affection, both external and structural, are widely different from those of cancer in the mammary gland, as might be expected from the differences of structure and office in the two cases, but the essential nature of the disease is the same in both. There is thickening and induration in the beginning, ulceration sooner or later, extension of mischief to the immediately surrounding tissues and the absorbent glands, with fatal termination. The appearances are more diversified in this case, according to the stratum of the general integument in which the disease may begin; this may be in the dense texture of the true skin, on its papillary and mucous surface, or in the loose connective tissue of its attached aspect. Again, there are differences of texture in the skin itself, as in the scrotum and the delicate covering of the external generative organs in both sexes, when compared with the general common integument, that must lead to diversities of external appearance in disease.

The most frequent seats of the disease are the lower lip, the tongue, the internal surface of the labia, and the parts between them, the scrotum of chimney sweeps, the glans and prepuce. It occurs less frequently in the upper lip and face, on the mucous membrane of the mouth and fauces, the neck of the uterus, the rectum, and the skin of the hand.

The origin and progress of the affection are well seen in the lower lip of men: it is very rare in the upper lip, and I do not remember to have seen it in the lip of women. A portion of the red edge gradually, and often very slowly becomes

thickened, hardened, and swollen, the surface being irregular and rough, or covered by a thin scab. Taken between the finger and thumb it is felt as a hardish mass. The change extends along the surface, involving the outer skin and the mucous membrane, but not going deeply. Ulceration begins sometimes by a fissure or crack, the surface having been previously raised, and presenting a broken appearance.

In a gentleman of fifty, who had never smoked, disease of the lower lip had existed between five and six years, without pain or material inconvenience. It consisted of a small, indolent induration, causing a slight swelling of the red edge and mucous membrane, of circular outline, not larger than a shilling, with ulceration in the centre, covered by a brown incrustation. It had commenced by an indurated tubercle, and had not been long ulcerated. After removal, the diseased part presented a small mass of firm scirrhous induration, while the ulceration had a broken surface like that of some warts. A healthy farmer of seventy had a disease of the upper lip, which had begun ten years before as a wart on the skin, half an inch above the red edge. The hardened part ulcerated, and the complaint slowly spread downwards to the mucous membrane, which was sound. It then formed an ulcer three quarters of an inch long, and half an inch wide, with a hard base, knotted and irregular margin, with sparing discharge, and covered by a hard adherent incrustation. A section of the part after excision showed the skin converted into a stratum of compact scirrhous structure.

The induration extends at the base, in the course of time; thus the disease advances lower in the lip, of which the integument and other tissues become converted into a solid, hard mass. The discharge from the ulcerated portion, not abundant, forms thin and closely adherent scabs. The absorbent glands under the jaw are not soon affected. The

disease, which is generally confined to the surface sometimes goes deeper, having a scirrhous formation for its base. Under the mucous membrane of the cheek I have seen, without much alteration of the surface, a whitish and not very hard tumour, of round form, and not less than half or three quarters of an inch in thickness. A section of the ordinary labial cancer shows the basis to consist of the integument converted into a texture not unlike that of the scirrhous mammary gland, but less hard, quite distinct from the other structures, which are unaffected. Microscopical examination detects an abundance of cells resembling the epithelium of the part intermingled with the natural structure. Speaking generally the complaint is not a painful one; patients often say that they have not suffered throughout; sometimes the local disturbance is more active, and there is more suffering.

The absorbent glands under the lower jaw become diseased in the progress of the case, one or more being moderately enlarged. At a later period, sometimes several years after an operation of which the cicatrix may remain sound, the glands along the side of the neck enlarge, and soon form a considerable firm mass, presenting in that respect a striking contrast with the small size of the original affection.

The disease in the lip clearly owes its origin to an external irritation, from the contact and pressure of the clay pipe in tobacco-smoking, and it is most certainly brought on by using a short pipe resting on and entirely supported by the lip. Fortunately for those classes who in my early years never dreamt of smoking, but now find it a necessary of life, the use of the cigar has never led to cancer of the lip within my experience. Should there be any doubt whether the use of the clay pipe can do all the mischief which has been ascribed to it, I may mention the case of an officer of title, with an obscure affection of the throat terminating fatally after a long

illness, for which treatment had proved ineffectual. It had been mentioned casually that he feared he had injured his tongue by making great use for a considerable time of a short pipe: no evidence of such mischief could be discovered. A large cancerous ulcer was discovered after death, occupying the very back of the tongue from side to side, and extending downwards into the pharynx: it had destroyed the epiglottis, which had disappeared altogether, although no evidence of its absence had been observed during life. On a careful examination of the mouth, a small slit, about one third of an inch in length, with sound and smooth margin, was found at the lower part of the side of the tongue, not far behind the frenum. A director introduced into this passed along a track under the tongue, which came out in the middle of the cancerous disease.

Irritating and escharotic applications are often made to cancers of the lip, with the effect of exciting more active enlargement, new growths from the surface, and increased suffering. Vascular and painful growths sometimes take place to a considerable extent, without such irritation. External applications should be of the most soothing kind, such as wetted lint with oiled silk, or preferably the softest wash leather wetted and covered with oiled silk. Such coverings will afford the most effective and comfortable protection in the case of long exposure to the open air, in warm or cold weather, especially with wind. The operation of excision is, however, the least painful, and the most definite and certain remedy. In the majority of instances, and particularly in the early stage, which is the most favorable in all respects, the horizontal cut is the simplest and best method, being quickly effected by transfixing the lip beyond the extent of the disease, and completing the proceeding by cutting out each way. The muscular structures, which have been pushed downwards by the

morbid growth, resume their natural position, and when the cicatrization is completed, very little appearance of loss remains. When morbid deposit has taken place under the diseased skin of the red edge, carrying the mischief lower down, the external integument becomes hardened and adherent, and a different operation is necessary. A V-shaped incision is required for removing the entire disease, and the edges must be united after the manner of the operation on hare-lip. Occasionally a still more complicated proceeding is resorted to. If the original disease has involved the whole breadth of the lip, or nearly so, a vertical incision is made on each side of the disease, and these are united by a transverse cut; the diseased part is then dissected off to the edge of the mucous membrane. The gap thus produced is to be filled by a portion of soft parts brought up from below. The two vertical incisions are prolonged over the bone into the neck, and a portion of integument is then lifted and drawn up so as to be fastened to the edge of the mucous membrane. For the successful result of this plan it is necessary that the mucous membrane of the lip should be sound, at least in great measure, since a lip without a mucous surface answers no useful purpose, not even that of retaining the saliva.

If the cancer of the lip is properly removed in an early stage, when confined or nearly so, to the red edge, without any affection of absorbent glands, the patient may remain well for years, and there is generally no return of disease in the part. Sooner or later the glands under the jaw or on the side of the neck become affected, the latter forming a very large mass, the progress of which leads inevitably to a fatal termination. I have known a patient to have one of these large formations in the neck after having remained perfectly well for nine years. They may destroy life without becoming ulcerated.

When a morbid deposit has taken place under the skin, the prognosis of operation is unfavorable. A stout hearty farmer, seventy years of age, with remarkably healthy appearance for his time of life, consulted me on account of an ulcer on the cheek, the size of a shilling, about an inch below the lower eyelid, level with the surface, rather foul and irregular. The basis was indurated, the induration including the skin. There was a thin discharge; a hard gland, about as large as a hazel nut, was discovered just within the angle of the lower jaw. It was not painful, causing little inconvenience, and had been treated with caustic without advantage. It was described to have begun with a wart, and to have existed seven or eight years, and to have been worse for the last year, in the course of which caustic had been used, which did harm. As the character of the affection was doubtful, a consultation was held on the case, in which the slow progress of the disease, the absence of pain, the excellent state of health, and the probable extension of the mischief, with great suffering, were held to be sufficient reasons for operation, although the question was nicely balanced. In removing the disease, I took care to cut at such a distance round it as to take away all the morbid parts. Three incisions were made through the skin, a horizontal one parallel with the edge of the eyelid, and one third of an inch below it, and two others in an oblique direction, one on each side, meeting below at an acute angle. It was necessary to go deep, as there was more to be removed than had been expected, and thus a considerable excavation was left, extending from a little below the edge of the lower lid to the angle of the mouth, and from the ala nasi to the masseter. The part removed turned out to be a hard (scirrhous) lump, as large as a walnut, of firm texture, and light gray colour, with well defined surface. The surrounding cellular substance and fat compacted and firmer than usual, but not

altered in texture, surrounded it so completely that until a section of the mass was made I did not know it to be a distinct tumour: it seemed to be a hard mass of fat. The process of repair went on so favorably that the surface was granulating healthily, and cicatrization was beginning on the tenth day, when the patient was able to leave London and take a day's journey home. The operation was performed in June, 1826. I saw him again in November, when I found a firm and sound cicatrix, without any susceptible subjacent induration. The gland under the jaw was larger, but less defined. At the end of June in the following year, I was informed by a gentleman from the neighbourhood of this patient that he was suffering severely from the rapid progress of his disease. There was renewed but not considerable ulceration in the face; great swelling under the jaw, so that it was difficult to open the mouth, and had been necessary to draw teeth for the introduction of food; much pain, and emaciation. Death soon followed.

I had occasion to remove a submucous swelling of the cheek, similar to the preceding in size and structure, for a gentleman between fifty and sixty, and one exactly alike for another gentleman a little over thirty. It was necessary in both cases to slit up the cheek, and the swellings were completely removed, although they extended backwards to the ramus of the jaw. These were of grayish-white colour, not so hard as scirrhus, without induration of surrounding textures. The mucous membrane was not much altered in either case, nor was there any glandular affection. Death ensued from return of disease in the part, together with large glandular swellings.

From the locality of its origin, and its early progress, the disease in the case of the farmer must be referred to the epithelial class of cancers; while the secondary glandular affection and the fatal end, are not different from what is

frequently witnessed in the analogous affection of the lip. Destructive ulcers of the face, which from their intractable nature, indefinite but very slow extension, and unfavorable termination, have usually been called cancers, and are now denominated rodent ulcers, present in some cases points of resemblance in their characters and in the extension of mischief to the absorbent glands to the epithelial cases, but differ from them in the possibility of receiving at least temporary alleviation, if not cure, by local means, when they may have become far too extensive to admit of excision. A man, about sixty, was an out-patient at St. Bartholomew's in 1831, with a large ulcer on the side of the face, of uneven surface, with knotted and irregular margin, which had existed twenty-four years. Its boundaries were the bridge and left ala of the nose, the left lower eyelid, which has been nearly destroyed, the temple, and the left angle of the mouth. A dressing of the liquor opii sedativus diluted had been used, with the effect of relieving pain. It was observed that the sore bled copiously on removing the dressing; on this hint leeches were applied to the surface repeatedly, and complete cicatrization slowly took place, except at the external angle of the eye, where a portion of skin was raised and tuberculated with small superficial ulcerations. The surface of the cicatrix still remained uneven, and the edge knotted and irregular.

An old man was admitted into the hospital in the summer of 1831, with an ulcer at the angle of the mouth of many years' duration, so large that excision would hardly have been practicable, even if there had not existed a considerable indurated enlargement of the submaxillary absorbent glands. He had erysipelas of the face, and as he was getting better the sore lessened, and its raised edge sank considerably. It was cicatrizing and in a fair progress to healing, when he left the hospital.

Ulcers of the face, commonly called cancerous, whether they really are so or not, are frequently found puzzling in practice from the want of definite and clear practical rules; and it is desirable for the establishment of such rules to know what becomes of patients, who, having been treated successfully at the time, do not remain under the observation of the surgeon, I therefore mention shortly a case interesting in its origin, and in the permanent success of an operation.

A lady, thirty-two years of age, had several small brownish red moles on the face. They were cutaneous elevations, smooth on the surface. A year before I saw her, she picked or scratched one of these on the side of the cheek, a little in front of the ear: it gradually formed a sore, which had been better and worse, but never well. Various applications had been tried without any beneficial effect by a surgeon, who had spoken of it as a matter of no consequence. She had suffered much from irregular and painful menstruation, had grown thin and pale, having lost her former healthy appearance. She was in London with her husband on account of her health, under the care of a physician, to whom she mentioned the sore on the face for the first time, on the evening before her intended departure for Lancashire. This led to my seeing her on the following day, when I found an ulcer as large as a shilling, with a slightly raised red edge, and an irregular surface made up of several small, yellowish excavations, yielding a thin clear discharge. The basis was a little swelled and indurated, quite moveable on the subjacent parts. There was no glandular affection. It was obviously necessary that it should either be excised or destroyed by some efficient escharotic, and my recommendation of the former was sanctioned by another opinion of great weight. I took care to remove with the sore a border of sound skin. There was an indurated mass under the skin, on the contrary the adipous

substance was quite healthy, and the skin, although thickened and firm, did not exhibit scirrhous change. An irritable condition of the skin caused some trouble in the management of the wound, which was necessarily treated as an open sore. The integuments below and in front of the wound were much inflamed, and large pustules formed on them, with most acute pain. It was found best at last to leave the part as much as possible open to the air, merely dusted with flour. The operation was performed on June 18, 1831, and she left town on July 20, with the wound about half healed, but in a perfectly satisfactory state; it soon closed. The cicatrix was pefectly sound in 1835, and for many years afterwards. I believe that the patient is still living.

The superficial nature of the disease in cases like the last, and in some instances of disease in the lips, might induce us to attempt their destruction by powerful escharotics, the chloride of zinc particularly. The use of the knife is preferable, as being definite and certain, removing all that ought to be taken away and no more. At the same time, it is far less painful.

A married lady, about fifty, of delicate health, had a small but painful swelling on the left temple from the pressure of spectacles, which she had worn habitually; it was red, of circular form, and would not bear pressure. It was slightly elevated. It was about the size of a sixpence, the mass of induration being inconsiderable, and the ulceration not deep. It was, however, very painful, and thus it became necessary to adopt effectual means of removing what would now probably be called an epithelial cancer. Her sister had died of cancer in the breast, the disease having returned after an operation, and this had given her a thorough dread of the knife. The chloride of zinc was therefore used, which certainly destroyed as much, both in surface and depth, as would have been

removed by the knife. The application was followed by the most severe pain, which lasted for several days and nights. The separation of the slough was followed by healthy granulation and apparently sound cicatrization. Within a month, however, an indurated tubercle formed in the cicatrix, and became very painful. The patient now readily consented to the use of the knife, and the part was accordingly excised; the patient said that the pain was nothing in comparison with the dreadful agony and long suffering caused by the escharotic. The excision was permanently successful.

Caustic and irritating applications are not unfrequently tried in superficial affections of obstinate and enduring character, of which patients naturally desire to get rid, almost invariably with the effect of inducing increased activity and pain in complaints previously indolent and nearly stationary. In such cases there is a choice between two courses, leaving things alone with protection and soothing, or effectual extirpation by the knife. Still the escharotic plan may be preferred occasionally for special reasons.

I have removed in two instances a single diseased absorbent gland of moderate size from below and within the margin of the lower maxillary bone, in cases where diseased portions of the lower lip had been previously excised. In one of these, though there had been thickening and hardening of the entire red edge with roughness and some small excrescences, the nature of the disease may have been considered doubtful. The condition of the gland deviated considerably from the healthy structure, presenting appearances sufficiently suspicious to make me satisfied with having recommended and performed the removal. This took place many years ago; the parts concerned in it, and the lip, have continued perfectly sound. The other instance was that of an hospital patient, who left the institution after the wound had healed.

Cancer of the tongue.—This shows itself under some varieties of form, all of them equally unfortunate in the certainty of their progress to a fatal termination. The most common is a firm, scirrhous induration, gradually developed on the edge of the organ, becoming ulcerated more or less deeply, and making its way in the muscular substance to the middle line, or further; it attacks the apex less frequently. It is generally confined to a part; but it may extend along the whole edge. There may be an irregular warty or granulated surface, red and fissured, and slightly prominent, but not ulcerated. In twelve or eighteen months, it may advance from a slight warty projection to a mass occupying half the organ, or more. It is painful, but not always equally so; the pain is often severe, described as shooting or burning. As the disease advances, the tongue becomes so hard and stiff that it cannot be protruded from the mouth, nor moved in mastication, articulation, and swallowing, without constantly increasing pain and difficulty, with aggravation from pressure against the teeth and contact with them in its motions, especially if there are ragged, sharp, or pointed parts. The ulcer may be somewhat superficial, but it is more generally excavated, with an uneven and sometimes broken surface, the basis and irregular sides being a thick mass of scirrhus, contrasting strongly with the natural softness of the tongue. Small portions of the ulceration may give way by sloughing, and more or less considerable bleedings may take place.

Sometimes the disease is confined at the outset to the mucous membrane, of which a portion larger than a shilling becomes thickened and superficially ulcerated. The basis has a firm feel, but does not seem to involve the muscular structures. This may come on the smooth lateral part of the organ, and is not attended with much pain. It pro-

ceeds gradually to the more serious painful and destructive state.

There are various affections of the tongue, syphilitic and others, attended with swelling, induration, and ulceration, which may be confounded with cancer, so that the diagnosis is not unattended with difficulty. A most cautious examination should be made of the case, with an inquiry into all circumstances before pronouncing an opinion which may seriously alarm the patient and friends. Under circumstances of doubt it will be more prudent to temporise and delay, to give those instructions respecting diet and general management, which will be necessary at all events, and to observe the effect of such means, before forming, or at least pronouncing, a decided opinion.

Cancer of the tongue, like other affections of the same nature, belongs to the middle or subsequent period of life; there is little probability that a disease, whatever may be its external character, occurring before the age of forty, or seated on the back of the tongue, leaving the edges free, will prove to be cancerous. A patient, thirty-two years of age, had a swelling at the middle of the back of the tongue, on its left side; the swelled part was red, painful, and occupied by two deep ulcerated fissures, parallel to the long axis of the organ. These ulcers were foul, and from one half to three quarters of an inch deep. The swelled part was firm, but not of scirrhous hardness. A small gland was swelled near the angle of the jaw. This was a syphilitic case. A gentleman of twenty-four had an ulcerated fissure of uncertain depth at the right side of the back of the tongue, quite at the posterior part. In this case also the complaint was syphilitic.

A lady between fifty and sixty, of unhealthy appearance, with red pimply face, who had often suffered from disorder of the digestive organs, had enlargement, induration, and deep

irregular ulcer occupying the tongue at its upper and highest part. The appearance was really formidable. It yielded readily to mild and simple means; to regulation of diet, and of the digestive organs, with mild local applications. She got quite well, and remained so.

A patient about forty-eight, who had lived rather freely, and had an unhealthy appearance, consulted me respecting a disease of his tongue. On the upper surface of the organ, in a space about one inch and a half long by an inch wide, the mucous membrane was thickened, indurated, and raised into irregular prominences, which, however, were smooth, and not ulcerated. The whole portion thus affected was hard and swollen. The complaint had existed some months, and had become so painful when he consulted me that he could hardly take food; washes and gargles had done no good. I ordered him compound decoction of sarsaparilla with compound decoction of aloes, and five grains of extract of hyoscyamus every night. At the end of a fortnight the pain had gone, and he was able to eat anything. The tongue was less swelled, and the mucous membrane much improved. He continued to go on with the liquid medicine. To take six grains of hyoscyamus at night. He was soon perfectly well.

In a female of twenty-six, there was a swelling of oval shape, the size of a large filbert, on the right side of the tongue, less hard than scirrhus. In its long axis and whole length there was a deep ulcerated fissure, the edges of which were irregular, but not everted. It was not painful. In a girl of nineteen, there was a circular excavated ulcer, the size of a shilling, on the dorsum of the tongue, with grayish surface, raised edge, and considerably indurated basis, painful chiefly in mastication. In a man of twenty-four, the right side of the tongue presented a rough, ulcerated surface, with everted edge, the size of a shilling. At the back of the organ, on the

same side, the mucous membrane over a similar space presented a smooth red surface free from papillæ, in the centre of which there was a deep foul ulcer, with hard circumference. A man of twenty-six had a general enlargement of the right side of the tongue, extending beyond the mesial line, but not involving the apex. The enlargement, smooth on the dorsum but uneven towards the edge, was almost of scirrhous hardness. It was neither painful nor tender to the touch, but it interfered considerably with articulation and deglutition. The foregoing cases, although syphilitic, do not present the most common form of venereal disease affecting the tongue; but the history and the age of the patients, with the characters of the ulcers, which could not be referred to any other origin, were quite sufficient for the purpose of diagnosis. Usually syphilitic ulcers of the tongue are superficial, varying in number and in size, but generally small, combined or not with tuberculated or fissured thickening of the mucous membrane; independently of other concomitant symptoms, and the history of the case, they could hardly be confounded with cancer. On the other hand, venereal enlargement and induration may occur to a degree and extent not only alarming to the patient, but liable to be misunderstood by the medical adviser, if he should happen to be without experience on the subject. A gentleman, under thirty, whom I had seen for primary syphilis, though long previously, had been travelling on the Continent for a year, suffering during the whole time great inconvenience and pain from a disease of the tongue, which had begun in a slight form as he was leaving England. He had consulted physicians and surgeons in France and Italy, taking various medicines without benefit, the complaint having apparently been deemed cancerous. The tongue, somewhat indurated, was generally enlarged, so as to interfere with mastication, and render articulation very indistinct.

The mucous membrane was thickened and uneven; there were no other symptoms. This disease yielded slowly but regularly to mercury, which it was necessary to employ by friction, as the bowels would not bear the internal administration. The cure was not only complete but permanent.

I have seen a few other cases more or less similar to the last. Although they may be confounded with cancer, there are sufficient points of distinction, so that, if the history be investigated and the symptoms carefully examined, there will be little risk of mistaking the comparatively mild and manageable venereal affection, for the very painful, and I fear inevitably fatal cancerous disease. I have always seen the latter begin on the edge of the tongue, generally at the middle or back part; it extends slowly into the substance, and may ultimately involve the greater portion or the whole organ. The hardness, which is in the highest degree, as in the scirrhous breast, renders the part incompressible; it is accurately circumscribed, so that we immediately feel the boundary of the disease. The hardness is less marked in syphilis, more diffused, and not confined in its origin to the margin of the tongue. Scirrhous induration does not last long, nor become considerable in extent without the occurrence of ulceration, while syphilitic enlargement may occupy one half or nearly the whole part, without any breach of surface. The cancerous ulcer is deep, often with an ash-coloured, partially disorganized and bleeding surface. Sometimes profuse and dangerous hæmorrhage occurs. The margin is hard, raised, everted, or rugged and excavated. The discharge is thin and offensive. The induration in syphilitic ulcerations is comparatively inconsiderable; the surface is of better character, and it seldom penetrates deeply. Cancer of the tongue is a hardened mass, which becomes ulcerated. Syphilitic disease is an ulceration, of which the base and

edges are sometimes thickened, moderately indurated, and raised. The morbid change in cancer gradually extends to surrounding parts, so that in the advanced stage the tongue is not only indurated but almost fixed. In a patient under my care in this hospital, the ulceration extended from the edge of the tongue to the tonsil, and fatal hæmorrhage took place from the artery of the tonsil laid open in the progress of the ulceration. In examining this case after death, morbid change was found to have extended through the whole thickness of the organ, which we had not been aware of during life, for the question of extirpation had been entertained not very long before the patient's death. The pain of cancerous ulceration is most severe, and aggravated by exertion of the organ in articulation, mastication, and swallowing. The aid of opium is absolutely necessary for procuring temporary ease. In syphilitic cases, the uneasiness is comparatively inconsiderable. The absorbent glands become enlarged and indurated in cancer; they do not suffer in syphilitic cases, or, if they do, it is from simple irritation.

I once saw a considerable excrescence on the side of the tongue of formidable appearance, which might have been supposed, as indeed it had been, to be of malignant character. It was in a gentleman of forty-two, stout, and of full habit, who had been accustomed for a long course of years to eat and drink freely. He had a large ruddy face, hot skin, very white tongue, and full pulse. The disease had existed two years, having been considered at first to be a common wart; it had grown of late more rapidly, in spite of escharotics. The growth, situated along the left edge of the tongue, was of oval form, at least an inch and a half in the long axis, and an inch across. Its height from the surface was three quarters of an inch. It was attached to the tongue by its whole breadth. The surface was not ulcerated, but

raised into irregular, prominent, convex elevations, the size of peas, with white epithelial surface, like that of the tongue; the substance was firm. It interfered most inconveniently with all the movements of the organ, but was not otherwise painful. Never having seen a similar case, I was in doubt respecting its nature, but believed it to be innocent, and decided on removing it by ligature. I passed a large curved needle, armed with a strong ligature, through the substance of the tongue, at the middle of the base of the growth. In order to be sure of including the whole substance, I cut a rather deep notch behind, and another in front of the disease, carrying the front and back threads along these notches respectively, and exerted my utmost strength in tying both threads. The strangulation was not quite perfect in one of the knots, but this did not interfere with the result. As the ligatures were not removed till the fifth or sixth day, the diseased part had become too much changed to admit of its structure being satisfactorily determined. The surface slowly cicatrized, the part remaining rather swollen and sore. Some weeks afterwards there was increase of swelling, with some ulceration, to which I freely applied the potassa fusa, with the desired effect of leading to a sound cicatrix and permanent cure.

In the treatment of this distressing malady the principal point for consideration is the value of an operation. The diseased part may be excised completely and effectively in the early, and even in a somewhat advanced stage of the affection. The wounded surface heals readily, and in general there is no relapse in the part. If there should be a return, it may probably be owing to the incision having gone too close to the disease, and thus it affords the useful caution of carrying the knife clearly beyond the extent of the mischief. With the removal of the morbid structures, and the cicatrization of the

wound, the pain and other inconveniences are effectually remedied at the time, and some patients have submitted to the operation as a temporary respite from suffering. It may, I believe, be stated as the universal result of experience, that although the tongue remains well, disease occurs in the absorbent glands, under the jaw, and at the side of the neck, often forming very large masses, which may open by a peculiar kind of suppuration, yielding either an imperfect pus or a thin discoloured fluid, proceeding to large cancerous excavations of broken surface, with abundant ichorous and generally fetid discharge. This renewal of disease takes place more early in cancers of the tongue than in others, sometimes within the year, and seldom after a much longer interval. In one instance, of a patient in St. Bartholomew's, for whom I had removed a circular piece, rather larger than a shilling, of mucous membrane thickened, indurated, and slightly raised, from the upper part of the organ in its anterior loose portion, the affection having been apparently confined to that membrane, there was ultimately the largest cancerous excavation under the jaw, and at the side of the neck, that I ever saw.

The operation of removing cancerous portions of the tongue cannot be spoken of favorably as a means of permanent cure, from the result of cases under my own observation. The only case in which it may seem not unlikely that an approximation may have been made to such a result was that of a female of fifty-eight, of spare habit and delicate constitution, who had a small hard knot in the edge of the tongue, unattended with pain. She attributed it to the irritation of a carious tooth, which was forthwith removed. As it continued to increase she came into the hospital under my care. The growth, which had existed about five months, was of the size and shape of a large horse-

bean, of which one half projected above the surface, there was a small and quite superficial ulceration on the prominent part, and it was free from pain. The apex of the tongue being held by an assistant, I took hold of the swelling by the vulsellum, passed through the healthy substance beyond its base, and removed it by a single sweep of the knife. There was considerable hæmorrhage, but no vessel could be tied. The diseased part was similar in colour and consistence to a scirrhous portion of mammary gland, but less hard and tough. The muscular substance taken away with the disease was perfectly healthy. She was still free from disease at the end of eighteen months, and I did not see her after that time. She lived in an almshouse a few miles from London, and had been recommended to my care by friends who resided near the place. I particularly desired her to come to me immediately if any change should take place in the tongue, but I never saw or heard of her afterwards.

A gentleman of sixty-one was under my care for some months, on account of cancer of the tongue. For six or seven years before his death he had been subject to autumnal attacks of dyspepsia, under which his tongue became aphthous, and to a considerable extent raw or excoriated, being so tender that he could not swallow solid food without great difficulty. After a time, rapid recovery would take place. He had been living very irregularly for a twelvemonth, and neglecting all means of relief, when his tongue swelled to so great a degree that he could hardly talk; when this had subsided a tubercle remained at the right side of the tongue, which also impeded his speech. After a consultation of surgeons in Paris, where he then resided, the diseased part of the tongue was cut out in October, 1844. The wound was never firmly cicatrized. When I saw this gentleman, in December, there was a long cicatrix on the right lateral and

anterior portion of the tongue, which was drawn towards the right side, showing clearly that a considerable portion had been removed. A profuse bleeding after the operation had stopped under the application of ice. The cicatrix was not closed in the centre; under it, and imbedded in the substance, was a hard lump, equal in size to a large nut, and there was an enlarged gland under the jaw. With much care the patient was made comfortable, but the disease soon became active again, with increased swelling, deep and foul ulceration, and severe suffering. In the course of these changes a violent bleeding came on to such extent as to cause serious alarm for life. It left him perfectly pallid and very weak, but suspended the progress of the disease for the time, removing the pain entirely, diminishing the swelling, and giving to the ulceration a clean and healthy character. The symptoms returned as the vascular system refilled; there were other hæmorrhages, but not to great extent, and the patient died, emaciated and worn out with suffering, in May.

The longest interval that I have known between an operation for the excision of scirrhous disease in the tongue, and the return of the disease, was in the case of a lady past sixty, who was under my care for some time in 1845, for extensive scirrhous induration, and partial ulceration of the organ. The whole right half and the middle of the tongue were enlarged and hard, but the ulceration was not extensive. There was glandular swelling under the jaw. She did not suffer much pain. She could take soft and half liquid food, and was well nourished by it. During the time that she continued under my care, the swelling and hardness extended to the left side, which was on the point of becoming ulcerated. I learned from her medical attendant in the country that the original complaint, which she had noticed a few days before he saw it, was a small fissure with thickened

edges, which she ascribed to the pressure of false teeth. An eminent surgeon in the neighbourhood was consulted, and recommended an immediate operation, and a piece as large as a walnut was accordingly removed, in 1836. The wound got well quickly and remained well, except occasional slight abrasions of the surface. These had returned more frequently in the last three years, terminating in little fissures. About a month before she came to London the tongue itself had considerably enlarged, and she was only capable of taking liquid food. The sublingual glands were much enlarged, but those of the neck were not affected. She did not suffer acute pain, the third of a grain of morphia at night being sufficient to procure comfortable sleep. As she was reduced in flesh, although the liquid food she took was of the most nutritive kind, she could not have lived long after returning to the country.

In operating on the tongue, there are two modes of proceeding, simple excision, and strangulation of the diseased part by ligature. It is necessary in both that the organ should be protruded to its full extent, and firmly held in that position towards the side of the mouth opposite to that of the disease, in order to enable the operator to carry his incision, or the application of the ligature beyond the posterior extent of the disease. This essential part of the proceeding must be effectually performed by an assistant seizing the front of the tongue between his finger and thumb, with the intervention of a cloth sufficiently rough to give a firm hold. A French instrument for holding and drawing out the tongue, without bruising it or giving pain, although ingenious, and sufficient for its object under other circumstances, cannot be trusted on these occasions. The closure of the mouth during the time occupied by the operation, which is short, is effectively prevented by an instrument devised by Mr.

Coleman, and held between the teeth of the opposite side, so as to be completely out of the operator's way, and thus very useful and convenient in many operative proceedings within the cavity of the mouth. A point of importance in this, as in all operations for the removal of cancers, is to take away with the obviously diseased parts a portion of the surrounding structures. There is copious bleeding from the exposed surface after excision, which may require, according to its extent, the ordinary means of ligature, cold water, or ice. I have never seen dangerous hæmorrhage. In the other mode of proceeding, a strong thread is to be carried through the substance of the tongue at the middle of the base of the disease, with a curved needle; when the latter is cut away, the two threads must be tied as tightly as possible, one behind and the other in front of the disease. These operative proceedings on the tongue are very painful, and, fortunately, very short in execution, as they do not admit of alleviation by the use of anæsthetics. More or less severe suffering may continue for several days after the application of the ligature.

In epithelial cancer of the external organs of generation in both sexes, there is an abundant production of external growths in various shapes and sizes, often in great wart-like and fissured masses, becoming dry and rough by exposure in the male, and sometimes completely hiding the glans, forming in the female red and vascular excrescences, of which the surface is uneven, tuberculated, or fissured. An offensive discharge takes place in either sex, and sooner or later ulceration comes on, followed usually by disease of the inguinal glands, which enlarge and ultimately break, opening into large and irregular excavations, with thick and raised margins, abundant thin and offensive discharge. Pain, which is often inconsiderable in the early stage, increases in the

progress of the disease, and is always severe in the advanced stage, the patient sinking at last under the profuse discharge and incessant suffering.

In men the disease may begin on the glans or lining of the prepuce, it involves both as it proceeds, converting the end of the organ into a large and firm mass of irregular warty surface. It does not extend rapidly on the external integument, nor on the body of the penis, the anterior ends of the corpora cavernosa being found quite healthy, although completely inclosed in the diseased mass. The corpus spongiosum of the urethra is also found unaffected. Sometimes the disease begins with induration of the glans, proceeding to ulceration, with hardened base and edge, the progress being slow, so that the disease may be seen fully established, with the prepuce still sound. Occasionally there is an adventitious deposit of firm but not scirrhous structure in the prepuce, with gradual extension of mischief to the glans, and considerable enlargement of the affected parts; the corpora cavernosa may here become involved. As soon as the character of the affection is clearly established, the operation should be performed beyond the seat of the morbid change, and with more favorable chances than in most other cancers, as the absorbent glands are not affected at an early period of the complaint. As this operation is frequently performed in an hospital on patients from the country, who return home when the wound is healed, we have no clear evidence on the question of permanent cure. In the case of a gentleman, on whom I had operated early, I heard incidentally, some years afterwards, that he continued quite well. Should excision be performed when the glands are diseased, not merely enlarged but hardened, disease will go on in them to destruction of the patient, although the seat of the operation remains sound. Should

the affection of the absorbent glands be discovered to be simple enlargement, without change of structure, as clearly as the case admits of, the operation might be undertaken on the chance, confessedly quite uncertain, of the glandular swelling subsiding.

The disease begins in the female most frequently on the internal aspect of the labia, or in the clitoris, with obvious marks of increased vascular activity, and morbid expansion of natural structures, in various and generally painful forms. As enlargement proceeds, the movement of the parts in progression, and the rubbing of dress, are sources of much suffering and distress. Irritating applications of all kinds are injurious. Free excision is followed by sound cicatrization, and relieves completely for the time, but disease returns in the neighbourhood, and is again removed. Ultimately the clitoris, nymphæ, and all between the labia to the entrance of the vagina are sacrificed, the whole course of the affair occupying sometimes four or five years.

Ulceration may affect the prepuce in the male, the neighbourhood of the clitoris and the entrance of the vagina in the female, advancing slowly without great pain. It destroys the mucous membrane, and thus presents an excavated and uneven surface, with indurated and sharp cut edge. It has the character and symptoms ascribed to the rodent ulcer of the face, heretofore regarded as cancer, but having a better prospect of cure from operation. I have only seen this affection in females, when from their natural delicacy they have concealed it too long to admit of operation. In a gentleman with an ulcer of this kind, nearly as large as a half-crown on the lining of the prepuce, I excised the part, not including the integument, which was sound. I saw him twelve years after, in consequence of an apoplectic attack, from which he died, and there had been no return of disease in the prepuce.

The disease of the scrotum, peculiar to chimney-sweeps, not to the boys who used to climb the chimneys, but to the adults, whose occupation keeps them constantly more or less covered with soot, belongs to the epithelial class in all its leading features. It begins with an elevation of some kind, called in the trade soot-wart, and spreads around with thickening, swelling, and some induration, the surface being uneven, and roughened, or throwing out warty irregularities, with a broken surface. It involves the cellular tissue of the scrotum, and thus may present a more or less considerable mass of disease. In course of time it ulcerates, the sore being sometimes superficial, but irregular and painful; or there may be an ulcerative excavation with raised and thickened edge. It may go on to convert the entire integument and cellular tissue of the scrotum into one thickened and hardened mass, closely surrounding and embracing one or both testicles, which are simply included, but not changed in structure. The disease is accompanied throughout with a characteristic discharge of most offensive and disgusting odour. The absorbent glands in the groin are affected sooner or later, and go through the same course as those of the jaw and neck in cancers of the tongue and lip. Effectual excision is the only remedy for this serious disease. If it is performed freely at an early period, including the testicle if it should be involved in the disease, and if exposure to the exciting cause should be discontinued, a permanent cure may be confidently expected. I removed the entire scrotum with both testicles in one case, and saw the patient alive and well at the end of thirty years. If the absorbent glands should have become recently affected, so that it may be doubted whether they are merely enlarged or changed in structure, it may be advisable to give the patient the chance of the operation, as the glandular swelling has been known to disappear after the removal

of the exciting cause, and it is an advantage at all events to get rid of the original mischief. I have had occasion, in a few instances, to remove chimney-sweeps' cancer from other parts of the body, for instance before and behind the ear: it has been a solid and firm, but not hard swelling, nearly equal in size to the last phalanx of the thumb, and without breach of surface.

Cancer of the skin is sometimes seen on the hand, the skin being thickened and reddened, then ulcerated; the margin of the sore being raised and irregular, the surface uneven, and the discharge thin. There is more or less of pain, and the progress is usually slow. The gland above the internal condyle may become enlarged, but those in the axilla suffer more frequently. The only safety for the patient is in removal of the part before the glands have become enlarged. Although general experience is unfavorable to the use of escharotics in such cases, I mention the following as a remarkable example of their successful employment under circumstances which appeared almost desperate:

I was consulted in the first week of September, 1857, by a gentleman of sixty, from the country, respecting a large and painful ulcer of the left hand. It occupied the ulnar side and extended into the palm, with dull red and uneven surface, bounded by thickened and raised integument. There was swelling with uneasiness of the entire limb, glandular enlargement in the axilla, considerable fulness on the corresponding side of the chest, supposed to arise from enlargement of glands under the pectoral muscles, and some increase in number and size of the superficial veins. He considered it to have arisen from a fall, in which the hand came to the ground, in the spring of the same year. This origin was altogether doubtful, as no wound, bruise, or other damage was occasioned. His own language, in speaking of the cause, was—"I always supposed it to come from a fall, and for a long time nothing was

to be seen, and I suffered but little pain, some itching but no sore, the colour red and blue; after which a very great and raised sore on the palm of the hand appeared, from which I suffered great pain, and continued to get worse." The state of the limb was so alarming that I immediately proposed a consultation. Mr. Quain, whom I had the pleasure of meeting on the following day, after a most careful examination pronounced a decidedly unfavorable opinion, in which I entirely concurred. We advised returning home; rest, soothing local applications, and a corresponding plan of general management, to which he had not yet paid attention; and we gave vague views of improvement with which he was well satisfied, expressing the intention of coming to London, a distance of fifty miles, twice a week, that I might watch his progress. I was agreeably surprised at seeing a slow improvement, which had become decided both in the state of the sore and the general condition of the limb, by the middle of October, when he came to town permanently. Soon after the favorable change came to an end, and fresh outbreaks took place near the original sore, in spite of various trials and alterations in local treatment. He now heard of the American quack, then in full vogue as a cancer curer. This person did not like the look of the cancer, and would have nothing to do with it. The only choice I could now see was between giving the matter up and sending the patient home, or trying some powerful local remedy, in the belief that the unbroken state of general health and constitutional power might bring things right if the disease in the part could be got rid of. The considerable improvement which I had witnessed at one time seemed to let in a gleam of encouraging hope in a prospect otherwise very dark. The patient readily consented to my proposal of a consultation with Mr. Stanley, which took place in the middle of November, when we agreed that if the

patient should be willing, a full trial should be made of the chloride of zinc as a last resource. This was carried into effect on the following day, when a mixture of the chloride and wheat flour in nearly equal quantities, the latter rather predominating, formed into a paste with water, and thickly spread on lint, was applied to all the ulcerated parts. Pounded ice in bladders had been prepared, in the hope of remedying by cold the intense burning pain inseparable from the action of the chloride; this, however, as well as freezing mixtures, and large doses of laudanum, were totally inefficient for the purpose, probably from the great extent of surface to which the caustic was applied. The pain still raged in the hand, which, when taken out of the freezing mixture, was of a deep red colour, and as cold as a lump of ice. I felt quite uncertain how so novel a state of parts might end, and I never saw a more severe agony than that endured by this gentleman for many hours. It gradually abated, and at last came to an end. The separation of the disorganized parts was followed, as usual, by healthy granulations and cicatrization. It was necessary some few times to apply the chloride in a mild form to some points, but the healing process went on favorably to a complete and healthy closure of the morbid surfaces; the general swelling of the limb, and the alarming state of the axilla and chest, had previously disappeared, and he left town in March, 1858, in perfect health, with a firm cicatrix, which is perfectly sound at the present time, the only imperfection being a bent state of the two last fingers from the contraction of the deep cicatrix on the ulnar portion of the palm.

September, 1862. Since the preceding account was written, I have been favored with a call from the gentleman to whom it refers. He is an excellent specimen of health, strength, and good looks, for his age of sixty-seven, having

greatly improved in all respects since the recovery from his painful and dangerous disease. The cicatrix is smooth, of good colour, and passes insensibly into the natural integument, which is perfectly healthy over the whole hand. It occupies about one half of the palm, and the entire ulnar edge of the hand from the wrist to the first phalanx of the two last fingers, and is continued towards the back over the metacarpal region of the little finger. It sticks inseparably to the metacarpal bone of that finger, and has thus confined it and the ring finger in a bent position, with little inconvenience, as it is in the left hand: the middle and last joints of both these fingers are unaffected.

CHAPTER XXI.

FUNGUS HÆMATODES.

Fungus Hæmatodes is a disease as intractable and formidable as cancer, or rather more so. The two affections were confounded until a comparatively recent period, though the difference of consistence is too striking to have escaped notice altogether: hence this complaint was called soft cancer in the testicle, the only situation in which it had been noticed before the beginning of the present century. The late Mr. Hey, who first clearly described the disease, gave it the name of fungus hæmatodes, because in a certain stage and in some situations it bursts through the skin, when a soft, and frequently bleeding fungus, protrudes at the opening. It bears other names, which mark its softness, and resemblance to the substance of the brain; thus it is the medullary sarcoma of Mr. Abernethy, fungus medullaris; tumeur encéphaloïde, or cerebriforme of the French. In reference to these names it may be observed that the morbid growth is not always characterised by softness, and the bleeding fungus is only an occasional occurrence.

In this disease there is the growth of a peculiar morbid structure as a new formation or tumour in the intermuscular intervals of any part, or its deposition in distinct and circumscribed masses in the substance of any organ. Not infrequently the new deposition, instead of forming distinct masses, is infiltrated into the substance of some tissue, as the

cellular, or in some organ, as in muscles or in the viscera. Distinct depositions and infiltration may occur in conjunction, the deposition in both ways being sometimes so abundant as to give the appearance of an organ being converted into a mass of the disease. The newly formed substance often resembles that of the brain in consistence, and even in colour; it is soft, pulpy, breaking down under the pressure of the finger; sometimes described as greasy. It is whitish, grayish, reddish, brownish, often mixed with coagulated blood, of which streaks, spots, or portions of various size, are disseminated through it. The entire mass is sometimes reddened throughout by the admixture of blood; there are sometimes cells containing fluid blood, recent coagula, or serum. The consistence varies; it is often soft, elastic, and conveying a sense of fluctuation so deceptive, that even experienced surgeons have sometimes formed wrong opinions respecting the nature of a disease, and have punctured a swelling in the belief that it contained fluid. In other instances the consistence is firm, and even hard, so that the nature of the disease cannot be determined by that single character.

Sometimes the disease increases to an immense bulk, distending the skin enormously, and completely disfiguring the affected part. It approaches to the surface, as in other cases; the skin is thinned and tense, red or livid, and soon rises into a prominence, which is soft, and gives way by ulceration. Then comes the protrusion of a soft, irregular fungus, from which an offensive ichor flows abundantly; this sometimes bleeds, the blood partially coagulating on the surface; sometimes it sloughs, and dead portions come away from time to time. Although this disease, like cancer, has usually an indolent period, and may even remain in that state for years, its growth is more commonly rapid and painful; suffering increases as it comes near the surface, and passes into the

fungoid state. Constitutional disturbance and pain may attend throughout, with certainty of aggravation in the advanced period by loss of appetite, rest, and flesh, under which the powers of life give way, and the patient sinks. In the progress of the malady secondary disease is developed in various internal organs, particularly the lungs and liver, even in the brain and bones. These are sometimes more numerous and varied than in cancer. The original tumour presents on a section a clearly marked lobular arrangement, the distinction of the lobes being sometimes very complete. Their principal bulk consists of the peculiar morbid structure on which their characteristic softness depends, varying in consistence from that of the brain to thick cream. This substance sometimes escapes at once from the cut surface, but more copiously on pressure, and still more abundantly after maceration, becoming diffused in the water, with which it mixes readily. After this material has been got rid of, an irregular fibrous framework, by which it had been supported, remains. The firmer specimens present the same lobular character on a section, with solidity of feel and appearance, but a soft substance, of cream-like consistence, is brought out, in greater or less quantity, by pressing the knife along the cut surface. There is an indefinite number of intermediate gradations between the softest and the firmest of these growths, and consequently in the relative proportions of the characteristic so-called medullary material and the firmer tissue which contains and supports it. The swellings are covered by a thin capsule, which separates them from the surrounding structure. This insulation presents a striking contrast to the invariable extension of cancerous disease to all contiguous structures. Blood-vessels are large and numerous, with thin coats, in the medullary growths and their capsules, also in the immediately surrounding parts,

which is immediately found out by the copious bleeding from the entire surface of the wound on their removal. The microscopical character comes near to that of cancer in the abundance of nucleated cells.

The primary disease is frequently seen as a tumour in the limbs or trunk, generally originating rather deeply. The eye in infants, and the testicle in adults, are often attacked by the disease, which may appear in any of the internal organs, the lungs, liver, kidneys, prostate, bladder, uterus, ovaries. It may affect bones, muscles, skin, and the female mamma; I have never seen it in the male breast. The secondary affections occur in the absorbent glands, and in almost all organs; the glands, however, are by no means so constantly involved in the mischief as in cancer.

The tumours met with in the intermuscular spaces are clearly new or original formations, and may retain their distinct character throughout, although with considerable increase of size; or the morbid structure may become infiltrated in all the surrounding parts, as we find in examining the immense enlargements formed occasionally in the limbs.

A patient received into the hospital under my care, in 1838, had experienced a sudden throbbing pain just below the elbow, from an exertion in lifting a basket of no great weight, in the autumn of 1833. In getting over a hurdle fence, a few days after, she felt the same kind of pain again, when she found, on examining the part, a knot the size of a pea. Producing no inconvenience, it was disregarded, but gradually increased to the size of a walnut in 1836. It had become larger, and was at times very painful, in 1837; she was admitted into the hospital in April of that year, when amputation was recommended as the only effectual remedy, but left the institution in a few days, declining the operation on the advice of her friends. Her country surgeon punctured the

swelling, supposing that it might be a cyst containing fluid; a small quantity of bloody serum escaped. The part became more and more painful, and the health suffered. She returned, and submitted to the operation. The tumour, which was injected, proved to be of malignant character, to have originated under the muscles, and to have passed into their substance in some places. The stump healed favorably, and continued sound; she recovered health and strength, and resumed her domestic occupations. On October 29th, a severe attack of pneumonia took place, from which, although recovery had taken place to a considerable extent, she died on January 12th, 1839, without having become materially emaciated. An examination of the body was not allowed.

The pulpy substance is deposited as a distinct growth when an organ is affected, as in the eye or testicle. In the former case the disease soon fills the limited space within the globe, then disorganizes, and breaks through the tunics, confounding all the surrounding textures in one morbid mass. The fibrous and serous tunics of the testicle become distended by the new formation, which still retains its distinct character, although under great enlargement, and thus, on careful examination, we find the light brown soft glandular substance of the organ unaltered in texture, but spread over the medullary deposit, like an additional thin tunic.

As a primary affection of bone, I have seen the disease only in the femur, and at its lower articular head, and in the tibia at its upper extremity, in the latter rarely. It has been seen in the upper extremity of the femur and of the humerus, and in the lower end of the tibia. The formation of a circumscribed tumour could hardly be expected in such structures, especially when, as frequently happens, the progress of the mischief is rapid; the medullary substance, therefore, seems to be infiltrated in the bony tissue. Much of the latter

disappears, its place being supplied by the morbid growth. A patient was under my care in St. Bartholomew's, about a year ago, for a considerable general enlargement of the knee, without discoloration. He was robust, with a considerable subcutaneous stratum of fat, although little more than thirty. He was in good health, and represented himself always to have been so, and had followed his usual occupations until the time of admission. The knee, though much swelled, could be moved nearly to the full extent in flexion and extension. There was a feeling of elasticity above and on each side of the patella, with an obscure and, indeed, doubtful sense of fluctuation; there was some pain. It was concluded, though with hesitation, to be a case of synovitis. The treatment employed under that supposition was ineffectual; the swelling increased, and the pain became so considerable that the patient urgently requested the removal of the limb, under the belief that the operation was his only resource. The undefined fulness, with the sense of elasticity, the uniform enlargement over the whole anterior and lateral aspects of the knee, and the absence of all inflammatory disturbance threatening suppuration, led to the supposition that there might be considerable and extensive swelling and thickening of the synovial membrane. The operation was performed in July, 1861, about five or six weeks after his admission; the thick flaps of integument were necessarily very large from the great bulk of the limb, but the healing process went on favorably in all respects, and the cure was rapid. The external coverings were all healthy, and the interior of the joint was equally so, with a slight exception. A soft, medullary mass, of light pinkish and grayish colour, with slight marks of division on its surface, completely enveloped the internal and superior aspects of the joint. The source of this was the internal condyle and shaft of the femur to about the

height of between two or three inches. In this extent the bony structure had disappeared, its place being occupied by the disease, which had just penetrated the articular surface at one point. The chance of permanent relief by amputation is more favorable when fungus hæmatodes occurs in bone than when it exists in other structures. If the whole bone can be removed, as in the case of the tibia, by amputation above the knee, the chance of permanent cure is better. The point is more doubtful in the femur, although the bone may be divided some inches above the diseased part, and where it seems quite sound. Some years ago I amputated above the thigh in a case of fungoid disease in the inner condyle of the bone. The patient was older, over forty, and thinner than in the preceding case, so that the diagnosis was easy before the operation, the event of which was perfectly satisfactory. Although the wound healed well, the stump was still swelled, with some hardness of the soft structures around the bone when the patient left the hospital, so that I warned him to let me know immediately if anything should happen. More than a year afterwards he was quite well. I gave the same caution to the patient whose case is related above when he left the hospital thirteen months after the operation, and nothing has been heard of him since.

The cause is just as obscure in this case as in cancer, and we are equally at a loss in both instances for a satisfactory account of the matter. Patients frequently ascribe the origin to some accidental occurrence, often of a trivial kind, as in the instance already related at p. 575, where it seems quite as probable that disease already begun should have caused the sensation complained of, as that the latter should have preceded and excited the malady. The evidence of an external cause must be admitted in the case of a gentleman, fifty-two years of age, under my care long ago, before the formation of

railroads. He was obliged to travel from London to the north of England, 130 miles, in the autumn of 1833, on the outside of a coach, and felt great pain from pressure of the iron forming the margin of the hard seat against the back of one limb in the ham. The part continued swollen and painful after his return home, so as to require rest and the repeated application of leeches, by which the enlargement was considered to have been cured; it was then covered by strips of adhesive plaster. A relapse of swelling and pain, for which leeches were again tried in vain, was ascribed to the confinement of the part, and a small tumour was discovered at the back of the limb near the ham. This had increased so much by February, 1834, as to require operation, by which a considerable mass of suspicious, but not very clearly characterised morbid structure was removed from the ham. The pain ceased, and the wound healed favorably, excepting a small sinus, at which it again made its appearance, higher up on the back of the limb, and it became necessary, in June of the same year, to repeat the operation, which required a long and deep incision, with removal of muscular portions involved in the disease and altered in colour. This operation, although serious in extent and depth, turned out as favorably as the preceding. After this the health gradually improved, the wound healed, and in a few months he was capable of walking without inconvenience several miles. In the summer of 1837 he again married, his health having continued excellent up to this time, and remaining in the same favorable state till the following winter. He had retired from the neighbourhood of London, where he had carried on business, to Somerton, in Somersetshire, where he died in December, 1838, under the care of Mr. Valentine, who kindly sent me an account of the examination after death. There had been no return of disease in the thigh. An attack

of pleurisy came on, ascribed to cold, and was treated in the usual manner, with partial recovery. Tumours at length appeared and brought him to the grave, worn down by constant irritation, and excruciating agony. Two swellings had formed externally on the left side of the chest, one on the lateral and posterior part, with a sense of fluctuation, and about eight inches in diameter; the other much smaller, over the seventh and eighth ribs, and two inches from the sternum. After death nearly the whole left side of the chest was occupied by a large swelling, with which the lung was in great part consolidated. This was composed of very thick walls, firm externally, but becoming softer and darker internally, and gradually passing into the dark brown semi-fluid and greasy mass, which formed the whole interior of the tumour. It resembled putrid brain mixed with dark blood, but had no fœtor, and had caused the sense of fluctuation in the external, which communicated freely with the internal swelling through the fourth and fifth intercostal spaces. About two inches in length of the sixth rib had disappeared, and for several inches before and behind this rib was softened, carious, and divested of periosteum. The smaller tumour was similar to that already described. The two surfaces of the pericardium were closely adherent throughout.

Instances in which there appears any reasonable ground for referring the occurrence of fungus hæmatodes to external causes are insignificant in amount when contrasted with the entire list of cases, and with the still far greater number of bruises, strains, shocks, and indefinite injuries, great and small, which are constantly happening every day and everywhere without any serious result whatever. How shall we be able to fathom the cause of diseases arising and proceeding to a fatal termination, as they may, in the first year of the healthiest infants.

Diagnosis.—In addition to the circumstance of fungus hæmatodes being as strikingly characterised by softness as cancer is by hardness of structure, the two diseases are strongly contrasted in other important respects. While the latter is seldom seen under the age of thirty-five, the former occurs frequently in young subjects. It attacks the eye in infants of a few months, and probably occurs oftener in that organ during the first year than after that age; it is common enough in adults and older subjects. I have seen the medullary disease fully developed in the testicle, removed by operation, relapsing, and proving fatal within the first year of a remarkably bulky, strong, and apparently healthy infant. From a child under two years, a testicle similarly disorganized was removed in St. Bartholomew's. After death which followed in a few months, there was a chain of diseased glands along the corresponding side of the pelvis and spine, numerous tubercles in the lung, and seven in the brain, the largest being equal in size to an orange, the smallest to a chestnut. They were of firm consistence, of dusky red colour with streaks of white, one was of a darker colour, having the appearance of a firm coagulum of venous blood.

A complete contrast is found in the relative proportions of the two affections in the organs subject to both. This is seen in the cases of the mammary gland and testicle. Cancer is so common in the former, that the cases probably constitute a considerable proportion of the entire number of malignant affections; while the fungoid disease is very rare. Fungus hæmatodes is of common occurrence in the testicle, in which cancer is almost unknown. The latter is extremely rare in the eye, where the former is not infrequent. Indeed cancer is rare in all parts except the breast, while the medullary disease is more equally distributed over the several organs and structures. Fungus hæmatodes, although

sometimes seen as an infiltration in the tissues of the affected part, is a new formation or distinct growth in the vast majority of instances, while primary cancer is hardly known as a separate tumour; I do not remember to have seen an instance.

The distinction between innocent and malignant tumours may be generally established on satisfactory grounds by careful examination of the part and investigation of the history. The former are generally superficial in situation, slow in growth and progress, free from pain and constitutional sympathy; the latter are mostly of deep origin, enlarging rapidly with pain, and disturbing the constitution, though in rare instances they may be indolent and remain quiet without much increase for an indefinite period. Clear, however, as the distinction is in many cases, it is by no means equally so in all, so that we may feel uncertain respecting the composition and nature of a swelling until the operation of excision offers the opportunity of clearing up what had been previously doubtful.

Treatment.—As we know no means of checking the course of the disease or removing it by internal remedies, we must be content with watching its progress, administering to particular symptoms or states of the malady, and giving relief by opiates in the manner least likely to disturb the head or stomach. The latter object will be most effectually attained in many cases by the hypodermic employment of opium. A patient was lately under my care in St. Bartholomew's, who had undergone elsewhere amputation of the foot on account of medullary disease. Although the wound of the operation had closed and remained well, pain was experienced in the stump; a tumour formed in the thigh, and there was a considerable and increasing enlargement in the abdomen, occupying the right hypochondrium and extending forwards

and downwards. He suffered intolerable pain night and day, over which morphine in considerable doses had little effect, although it disordered him greatly. The hypodermic injection under the skin of the forearm of half a grain of morphine in three minims of water produced complete relief in less than five minutes, and this lasted for twelve hours, when it was repeated. This plan was continued with the effect of keeping off pain entirely and giving good rest at night. It was necessary to increase the injections, in the same quantity, to three and then to four times in twenty-four hours, and with the same effect during the eight or ten weeks that he passed in the hospital before his death. Opium may be employed locally in the same way as in cancer.

The most important point in treatment is the question of operation; and the result of experience is that, whether in the case of medullary tumours or of organs affected with this disease, although, as in cancer, the operation is successful, either the disease returns in its original seat or neighbourhood, or secondary formations take place in various parts; or, again, that these circumstances may be combined, the malady being thus inevitably fatal. Why then, it may be asked, should operation be ever resorted to? Perhaps the strongest reason is that it sometimes prolongs life, not to great extent, not so frequently, nor for so long a period as in the case of cancer. A gentleman, whose case I shall relate, lived nearly three years after operation; and a lady operated on in the early part of 1851 for well-marked medullary disease, is now alive in perfect health. Secondly, as in cancer, the operation prevents the painful and distressing circumstances of extensive ulceration, fungous protrusion, sloughing, offensive discharges incidental to the natural progress of the disease. Thirdly, the operation may be called for by the patient as a means of escape from the severe pain and constitutional dis-

turbance attendant on the disease. Fourthly, there are the doubtful cases, in which removal of the disease may be recommended by the surgeon, and will almost certainly be demanded by the patient.

As the practical aspect and bearing of this question are somewhat different under different circumstances, the most convenient arrangement will be to consider it separately, in relation, first, to the cure of distinct tumours, and then to that of particular organs.

CASES OF MEDULLARY TUMOURS.

Case I.—*Medullary tumour in the thigh; operation.*

A married woman of forty-eight, who had borne a family, consulted me in summer on account of a swelling in the thigh, unattended with pain, and not preventing the performance of her duty in service. In a few weeks I saw her again, the disease having increased considerably, being firm, undefined, deeply rooted, and advancing before the femoral vessels: she was admitted into St. Bartholomew's. After the serious nature of the disease and of the operation for its removal had been explained, with the probability of recurrence, she consented to the proceeding, but changed her mind and left the hospital, returning in September with increased bulk of disease feeling elastic or with doubtful fluctuation. On the suggestion that it might be a cyst, a grooved needle was introduced on September 3rd, and two table-spoonfuls of a watery fluid escaped. A free incision external to the femoral vessels through the skin and subjacent fascia exposed the sartorius muscle extended over the tumour, and a firm capsule. When this was divided the disease was found to be of the softest medullary kind, and was easily separated in a large mass by passing the finger round its circumference.

As soon as this was done, the blood rose from the bottom of the wound in an alarming quantity, and streamed over the thigh of the patient, so as to cause some fear of her dying on the table. It was now necessary to adopt immediate and effectual means of stopping the bleeding, and this was accomplished by broad strips of adhesive plaster, so applied as to bring the sides of the wound into firm contact, and then supported by a firm roller. She was taken to bed, and there was no further bleeding. The wound went on favorably, the limb had recovered its natural size before Christmas, and she was thinking of her return home, when pain returned in the part, the wound opened with sanious and fetid discharge, and masses of medullary substance; bleeding and difficulty of breathing ensued, and death took place on April 16th.

Case II.—*Medullary tumour of the thigh surrounding the femoral vessels, considerably detached in an operation, and then sloughing in a mass.*

A robust Welshman, forty-seven, employed as a policeman, who had always enjoyed good health, was received into St. Bartholomew's in October, 1849, on account of a swelling in the right thigh, which had arisen a fortnight after a kick on the part, and nine months previously, having grown rapidly at first, and then been stationary for ten weeks. It was hard and unyielding to the touch, with tolerably free lateral motion, situated rather above the middle of the thigh. The femoral vessels were supposed to be either behind or towards the inner side of the mass, and to be unaffected, as the tibial arteries pulsated equally on both sides. He could walk five or six miles without inconvenience. There was shooting pain in the inner side of the knee and ankle, and pain was excited by pressure on the inner side of the swelling which was not otherwise tender. The propriety of

an operation was determined on in consultation, and I performed it on October 13th, beginning with an incision about eight inches in length, over the middle of the tumour, in the long axis of the limb. The sartorius was exposed and divided, when the anterior and lateral connexions of the mass were quickly severed. The tumour presented a smooth, circumscribed outline; it was hard, but with an elastic feel. A slight incision made into its substance was followed by free arterial hæmorrhage. In order to separate the mass from its deep posterior connexions, I held it upwards and kept the edge of the knife close on its surface; a violent bleeding quickly ensued from the femoral artery which was cut across; it was immediately seized and secured by ligature. The deepest attachments still remained, and the whole disease could not have been removed without cutting through the large vessels above the swelling, a proceeding which would have been out of the question even if the patient had not already lost a large quantity of blood during the operation. I therefore closed the wound, with firm support of the parts by adhesive plaster and bandage. He was removed to bed in a very low state, vomiting much, and complaining of pain in the knee, but not in the seat of disease. On the 20th the whole tumour had perished, and was converted into a black mass, surrounded by a healthy granulating surface. This slough which was easily removed on November 10th was as large as an ordinary orange, and perforated by a large artery, and by another canal lying close to it with less distinct coats; these were evidently the femoral vessels. On December 13th, the wound was nearly closed and he could walk with a stick. He was discharged well on the 19th, when he returned to his residence in North Wales, where he died from return of disease in the thigh in eight weeks. Both lungs were studded with larger and smaller masses of

yellowish grey substance, with the characters of firm medullary cancer, and the mass which had returned in the seat of disease had the same appearance.

CASE III.—*Medullary tumour of the arm, removed; relapse, and amputation at the shoulder joint.*

A lady of twenty-six, of fair complexion, with light hair, had enjoyed good health, but there was generally a scurvy state of the skin, and some members of her family had suffered from scrofulous ailments. About the end of 1833, she noticed a small hard tumour in front of the right arm, unaccompanied by pain. Early in the following spring, the tumour was observed to have increased, and it was then attended with pain. It grew in spite of various means employed with perseverance, becoming more and more painful. Her nights were restless, and there was much constitutional irritation. In May, 1855, I was consulted by this lady, who also saw Mr. Stanley, and we concurred in advising the removal of the tumour, which I performed accordingly. A tumult of irritative fever succeeded, attended with delirium. At this time the patient was five months advanced in her second pregnancy. This disadvantage was over-ruled by the size of the swelling, its rapidity of increase, and the certain augmentation of bulk if the proceeding had been delayed till after delivery. As the disease was found to be situated under the brachialis anticus, its exposure required a large external incision. The operation was long and severe, and the loss of blood considerable. The tumour, which lay upon the bone, but was not connected to it, having been freely movable laterally, was about the size of a small orange, dark red, firm, and much resembling a kidney in consistence. In July she returned to her residence at the sea-side. The wound was not yet healed. Three or four sinuses had

formed, which continued to discharge. She slowly regained her strength; the sinuses closed, but the cicatrix retained an unhealthy appearance. In September she gave birth to a healthy child. Shortly after she began to complain of pain in the part, which had a hard and unnatural feel. A morbid growth had formed on the bone above the seat of the original disease, the arm was hard, swelled, and most acutely sensitive in its upper third, the axillary glands were unaffected, and there was almost constant lancinating pain. Mr. Stanley and myself now considered amputation to afford the only chance of prolonging life, and on the 31st of January, 1836, I performed it at the shoulder-joint. The number of vessels requiring ligature amounted to between thirty and forty. Everything went on well, and the wound was healed by the end of the tenth week. The morbid growth in contact with the bone, similar in character to that of the first tumour, was not of great bulk. All the surrounding vessels were much enlarged. For some time she continued to gain flesh and strength. About February, 1837, she began to complain of oppression of the chest, with difficulty of breathing on walking up an ascent. One day, after dinner, she went up stairs faster than usual, whereupon a spitting of blood ensued, which happened again repeatedly during the next three or four months, and was attended with a cough. These symptoms abated, and severe pain in the head came on. From this time sight was affected, gradually almost to blindness, and the senses of smell and taste were impaired. Subsultus tendinum, and, sometimes, delirium supervened, after violent paroxysms of pain. Death put an end to a state of the most acute suffering on the 24th of August, 1837. No examination of the body took place.

The patient attributed the beginning of her ailments to an accident which had happened about two years before their

commencement. She was struck by the winch-handle of a swing-bridge, which caused her to complain of pain in her back and chest for some days. It could not be made out for some days that she had complained of any hurt to her arm on the occasion.

CASE IV.—*Medullary disease, originating in the great sciatic nerve; operation.*

M. A. M—, æt. 47, was admitted into St. Batholomew's for a tumour of the hip and the buttock. She had applied for relief two years ago, complaining of excrutiating pain in the side of the foot, which deprived her of rest. Although relieved by opiates used internally and externally; the pain never entirely left her. Shortly before admission, she mentioned the existence of the tumour, and was received on that account, with a view to its removal. It was a bulky enlargement behind the trochanter, deeply covering the ischiatic notch, and the tuber ischii; covered by the gluteus maximus, less movable upwards and downwards than from side to side. When the muscles were put on the stretch, so as to press upon the tumour, there was a peculiar sensation of pain along the course of the nerve, and in the foot, which ceased when they were relaxed. Her general health was tolerably good. I made an incision of a foot in length through the integuments, and the gluteus muscle, and thus exposed the tumour, which was covered by a firm capsule. Upon dividing this, the swelling proved to be a reddish, vascular, and fungoid growth, of the consistence of brain, yielding readily to the pressure of the finger. It was partially removed; as it could not be detached from the pelvis, the outer and greater part of the mass was cut off; the base was then found so closely connected with the

ischiatic nerve, that it was necessary to divide the trunk, and remove about three inches, of which the fibres were separated from each other, spread out and intermingled with the substance of the tumour. Although cut through as near as possible to its exit from the pelvis, the section was necessarily made where the nerve was in the unnatural state already mentioned.

Although she did not lose much blood in the operation, she began to sink a short time after, the face became pale and anxious, the features shrunken, the pulse barely perceptible. With the help of wine and brandy, the circulation partially recovered. Towards the evening, she again sunk, the pulse became altogether imperceptible, the extremities cold, the teeth firmly closed, and the action of the heart could just be ascertained. Brandy and liquor ammoniæ were resorted to, and animation slowly returned, but she continued insensible for three or four hours, tossing about continually. The operation had been performed in December, and she left the hospital well in March, with sensation and power of motion in the front of the thigh, but none in the foot. Some months after, the foot had recovered sensation and motion to such a degree that she could walk well with a stick, and she continued in good health. She went on well for nearly two years, and then died from return of the disease.

Case V.—*Malignant (medullary ?) tumour on the thigh, with several formations in other parts of the body. Life prolonged for many years after amputation.*

The Rev. C. H. S— consulted Sir Astley, then Mr. Cooper, in 1819, for a tumour on the thigh, which had begun six months previously, appeared spontaneously, and had grown rapidly. Mr. Cooper considered the disease to be fungus hæmatodes, and recommended amputation, to which

the patient consented, and took a lodging near London; the day was fixed and the surgeon attended. He was probably alarmed by the state of the patient, and postponed further proceedings until a consultation should be held on the case. Sir Everard Home, Messrs. Cline and Abernethy, who met him on the occasion, were unanimous in the opinion that the disease was malignant, and that an operation would be hopeless. The patient returned to his residence in the country, under what seemed equivalent to a sentence of death, and determined in his despair to see Sir David Dundas of Richmond, an excellent practitioner of long experience, who had seen him originally, and did not think quite so badly of the case, not regarding it as desperate. He also requested the attendance of Sir W. Blizard and myself in consultation on his case. We found a large tumour on the inside, and rather to the front of the left thigh, a little above the knee; it was of bright red colour and had an elastic feel. There was a firm, indolent tumour, as large as an egg, deeply seated at the back of the pelvis, and a similar one in the back near the spine; one as large as a nut in the left eyebrow; while several small knots could be felt under the skin in various parts of the body. He was worn down by the irritation of this disease and entire want of rest to the greatest degree of weakness, excessively emaciated, with rapid and feeble pulse, and profuse fetid perspiration. The case seemed to me perfectly hopeless; Sir W. Blizard, who thought that a very slight chance of benefit was offered by removal of the limb, amputated high up two days afterwards. The patient was immediately relieved from the more serious and distressing symptoms, and eventually got well, remaining in a fair state of health, though subject to irregular and often severe pains of nervous character, sensitive to external influences, and obliged to manage himself very cautiously.

In 1825 it had been necessary to remove the superciliary tumour, which had become larger and troublesome, a portion of the supra-orbitary nerve, being closely adherent, was taken away with it. In December, 1828, he consulted me on account of a swelling in the forearm, as large as a walnut, apparently connected with the ulnar nerve, and causing pain with various sensations in the course of that nerve, upwards and downwards. The dorsal and pelvic tumours were unchanged; knots could be felt under the skin in various parts, but were not visible. He was nervous and irritable, with an aged look, and an expression of suffering. In February, 1829, the tumour in the forearm was removed; it was deep, firm in texture, and closely connected with a nerve, of which a portion was removed with it. The wound healed favorably. In December, 1830, a tumour, which had formed since the last operation, was removed from the stump. He had not been aware of its existence until his attention had been directed to the part by violent lancinating pains. This was equal in size to a goose egg, circumscribed, and presenting on division an appearance like that of scirrhus of the mammary gland, but less hard. It extended to the tuber ischii, so that the exposure and complete removal of the mass required an incision in the whole length of the stump. Although never in good health, and occasionally suffering severely, he lived on till about 1846, the tumours on the back and pelvis having remained in their original state.

Case VI.—*Large tumour of suspicious character in the thigh; operation.*

Cases of various kinds are frequently met with, for which we are at a loss to find a proper place in our nomenclature and classification, and we are sure to meet with such doubtful examples among tumours, as in the instance of a gentleman

who had a swelling in the back of the thigh, occupying nearly the entire length of the part. I made an external incision, at least a foot in length, and found the large diseased mass closely covered, and inclosed with the flexors of the knee by the fascia lata. Having made a slit in that structure, I had the pleasure of finding that the connexions of the disease were loose, so that when the division of the fascia had been sufficiently extended, I was able to turn out the mass almost completely with the fingers. The blood welled up so copiously and rapidly from the entire surface of the great cavity thus exposed, that it was necessary for the safety of the patient to stop the hæmorrhage immediately and effectually. This object was accomplished by bringing the sides together, and applying strong pressure by means of adhesive plasters and roller. Expecting the occurrence of subsequent bleeding, and of difficulty and delay in the process of healing, my fears far exceeded my hopes. There was, however, no further trouble, the wound healed quickly and well, and nothing unfavourable had occurred in the next year or two. The disease consisted of a rather loose but very vascular texture, of which I do not remember the exact character.

MEDULLARY DISEASE IN THE EYE.

The organ of vision is one of the most frequent seats of this very serious and alarming disease, which is often met with in healthy children, and in the first year of existence. The morbid substance is usually deposited in the fundus of the globe, where it is distinctly visible through the transparent media, and produces a bright metallic reflection in the pupil which can be hardly overlooked, as it contrasts so remarkably with the natural clear black of that opening. The increase

of the deposit distends the eye and disturbs its circulation, soon causing opacity of the lens, and pushing the iris against the cornea. The circumstance could not be more favourable to the complete removal of malignant disease in its earliest stage. This has been repeatedly done with uniform failure by return of disease in the part, and ultimate fatal termination. The hope of benefit from an operation being thus entirely abandoned, we anxiously inquire whether a chance of relief can be discerned from any other source. There is some evidence that the employment of mercury in an early stage of the disease, probably before the crystalline lens and iris have suffered in any way, may sometimes check the complaint, and even lead to what may be called a temporary cure.

I was consulted in the case of a boy six years of age, in good health, in whom the disease had been accidentally discovered by the metallic reflexion in the pupil; the eye appeared healthy in all other respects, but vision was lost, which had not been observed previously. I ordered the gray powder two or three times daily, in doses of two or three grains, pushing the remedy as far as could be done with safety to health. The lens soon became opaque, and the iris was a little pushed forward. The disease, instead of increasing, became quiet, the lens was slowly absorbed, and an opaque capsule remained behind the pupil, effectually concealing the interior of the globe. The general appearance of the organ was not altered. The health remained good for a year or two from the first notice of the disease. He then had a serious illness, attended with pain in the head, and considered by the attendant physician to be water in the head. From this he recovered, and remained tolerably well for nearly two years. The physician remarked that he looked remarkably well, and actually inquired which

eye was dark, as both looked so exactly alike. He seemed perfectly well on the evening before his death; on the following morning at breakfast he was sick and complained of excruciating pains in the head, which went on for six hours, when he expired at the age of ten years and a half. The contents of the cranium were actively congested, and a small portion of firm diseased structure was discovered on the inner flat surface of one cerebral hemisphere.

In the early part of 1841, I saw a child from Liverpool, in consultation with the late Mr. Thomas and the late Mr. C. Guthrie. It was an unequivocal example of fungus hæmatodes of the eye. The lens and iris being unaffected, I proposed the long-continued use of mercury in small doses. In June, 1842, I received a letter from Mr. Neill, of Liverpool, stating that "some four months ago, a smart attack of inflammation took place in the diseased eye, which was reduced by leeching, &c., since which time a wasting away of the eyeball has been going on similar to that wasting which goes on after a punctured wound in the neighbourhood of the eye, and the eyeball is now a mere yellow shining morsel, not a fourth of the natural size. The other eye is showing symptoms of disorganizing inflammation also, and the vision is becoming very indistinct. The pupil does not dilate by the use of belladonna, the iris is puckered round the edge, and the eye has the appearance as if the posterior humours pushed the iris against the cornea, as is often seen in glaucoma."

FUNGUS HÆMATODES OF THE TESTICLE.

Medullary disease is frequently met with in this organ, more often in the active period of life, from twenty to forty,

than at an earlier or later age. I have already alluded to two cases, of which one terminated fatally in the first, and the other in the second year (see p. 581). The disease may be of the softer or firmer kinds, it may advance more or less rapidly, but seldom exists for more than a year without having attained a magnitude which leads to the question of operation. The enlargement is of uniform surface, and covered by healthy scrotum. It is not a painful affection. I have never seen it make its way externally, though in an instance where the disease had been left to its full development and secondary formations had taken place in various parts, the original tumour was full ten inches in length. The part is generally removed by operation, although no instance is known of permanent cure from that proceeding. The wound heals in the usual way, and the cicatrix remains sound, but death is gradually brought on by a large development of disease in the abdomen covering the spinal column behind the peritoneum, and generally involving the pelvic and lumbar glands. The duration of life after the operation varies, as will be seen in the three following cases, of which the last presents the greatest prolongation within my own experience.

Case I.—A gentleman, fifty years of age, of healthy appearance, but bearing scars in the neck, indicating that the glands in that region had suffered considerably in early life, consulted me for an enlargement of the testicle to the size of a fist, which had been gradually increasing for two years, mercury having been taken so as to affect the system, and the iodide of potassium having also been given freely without any influence on the complaint. After a consultation on the case, and assisted by Mr. Stanley, I removed the testicle, which was a well marked specimen of medullary disease, from the cut surface of which thick creamy fluid could be

scraped out in considerable quantity. On the tenth day after the operation, when the wound had united well, I was suddenly summoned and found him in a high fever. He was bled from the arm with alleviation of the symptoms, but died in twenty-four hours. On examination, all the thoracic and abdominal viscera were found healthy. Over the large vessels on the vertebral column and behind the peritoneum, the cellular tissue was infiltrated with a large quantity of medullary disease. The lumbar glands were healthy.

Case II.—I was called to a clergyman in the country with an enlarged testicle, which his surgeon had declined to remove, principally on account of swelling and thickening of the cord. At an earlier period this gentleman, a cautious and prudent practitioner, had punctured the swelling, in the belief that it was hydrocele, and he was so firmly convinced on this point that he made a second puncture, as the first had been unsuccessful. The tumour was of firmer consistence when I saw the case, and the cord was merely affected by the increased weight of the part. The patient had determined to undergo the operation unless some other effectual treatment could be recommended, and I therefore removed the testicle, of which the cord was simply thickened. The testicle presented an example of firm, medullary disease, of a thick reddish fibrous structure, with deposits of coagula throughout. The patient soon got well and seemed perfectly recovered; the wound healed and remained sound. He continued in good health. About a year after that time, he began to waste in flesh, he lost his appetite, and felt ill, without any definite complaint, though the symptoms rather pointed to the chest. He grew worse and worse, and died.

Case III.—A gentleman of fifty-one, of robust frame and

considerable bodily power, who had always enjoyed good health, experienced, in the summer of 1849, a swelling of the right testicle, of uniform surface, firm, but not hard, and free from pain. It increased gradually in spite of the use of mercury carried to salivation, and I removed it on December 16th. It was a specimen of the medullary disease in its firmer form, and the cord was quite healthy. He recovered so rapidly from the operation as to be able to leave town on the eleventh day after its performance. He continued in full health and strength, discharging his professional duties as a barrister in large practice with perfect ease and efficiency. Just after Christmas, 1851, the left leg began to swell, and the whole limb was considerably enlarged by the end of February, 1852, the health and spirits being good. Soon after the right foot and leg became œdematous, and both limbs were greatly swollen, the state of general power being so good that he still attended in court, and addressed the jury sitting. The general health failed, pain came on in the right loin, he gave up professional duty, and took to his bed in the end of April. Suppression of urine came on in the beginning of May; on the 11th of that month he became unconscious, and died in a few minutes. A large white mass of disease, consisting of a brain-like or creamy matter, interspersed with firmer portions of more solid and yellow material, had formed behind the viscera, covering and closely adhering to the lumbar spine. It extended on either side along the brim of the pelvis, involving the iliac vessels and the ureters, encroaching upon and covering the kidneys, both of which were soft, while the left was small, and showed much white inflammatory deposit. All other parts were healthy.

A gentleman, about twenty-five, who had suffered repeatedly from clap, contracted that complaint again in the autumn

of 1837, the symptoms being extremely violent. They had gradually abated, so that he was able to resume his usual avocations, which required great personal exertion, when, at the end of February, 1838, the discharge not having entirely ceased, the right testicle swelled, and became painful, the complaint being considered and treated as hernia humoralis from clap. The swelling lessened, but did not disappear. In March, 1839, it enlarged again, without much pain, and resisting all remedies both local and internal, had attained the size of the fist, when I saw him in July, and removed it by operation. It was the first case in which I had seen the disease as a distinct new growth imbedded in the substance of the testicle. The disease in this case was in the body of the testicle, which presented a uniform oval enlargement, of normal appearance, so far as the external covering was concerned, except at one point, where the membranes were a little raised by a yellowish body, as large as a horsebean. On cutting through the testicle, a large oval tumour was found growing from behind, and surrounded everywhere by a thin layer of the glandular substance of the testicle in a nearly normal state. The tumour was not homogeneous; portions were yellow, others red, whitish, or grayish. It was moderately firm, and a prominent knot of its substance had raised the tunics at the point already mentioned. This gentleman died in about a year after the operation, having become indisposed without any mark of local affection, excepting pain in the abdomen and back.

In January, 1841, I removed a diseased testicle exactly similar to the preceding, in the case of a gentleman, aged twenty-nine, who had previously enjoyed good health. The disease had existed four months. The wound healed rapidly, and he had enjoyed excellent health, and looked well when I saw him in September of the same year, but he had expe-

rienced lately pains in the back and loins, and sometimes along the front of the thighs. A large tumour could be felt in the abdomen below the epigastric region, and a smaller on the spine below.

FUNGUS HÆMATODES IN THE BONES.

I have already mentioned this subject, and related two cases in which amputation of the femur had been performed with apparently permanent success, on account of this disease, in the condyloid portion of the bone (see pp. 577 and 578). Having there stated that the chance of perfect recovery is greater when the head of the tibia is the seat of the disease, I think it necessary to mention two cases which throw some doubt on this point.

CASE.—*Medullary disease in the superior articular extremity of the tibia, with secondary affection of the inguinal glands and the liver.*

I was consulted on February 21st, 1825, by a gentleman, twenty-two years of age, tall, of stout frame, fair complexion, and light hair, for a swelling at the knee. There was a general fulness about the tibia, with a slight redness. Pain was brought on by exercise and ceased by rest. I thought it an inflammatory affection of the bone, and treated it accordingly. Having been quite well at the preceding Christmas, he had felt pain in the knee since, and supposing it to be rheumatic had endeavoured to dance it off, and went to Cambridge to pursue his studies. He returned to London in the beginning of March, when the complaint was worse. The late Mr. Okes, of Cambridge, had felt pulsation in the part, and thought the disease aneurismal.

There was now a tumour between the bones, and immediately under the knee, with general fulness at the same part, and some swelling below. The most prominent part of the tumour was so elastic that no doubt existed of its containing fluid. There was some pain on pressing the tibia; no pulsation in the swelling, but that of the tibial arteries was suppressed, though plain on the opposite side. There was general indisposition, with loss of appetite. The case appeared quite doubtful to two eminent surgeons, who saw the patient in consultation with me. The swelling now enlarged with a considerable protrusion standing out under the knee, without any definite boundary, and continuous so as to include the tibia in its basis. At this time the tibial arteries again pulsated. There was much constitutional affection, with accelerated pulse, loss of appetite, and bad nights. The sensation of fluidity was now so strongly marked that a deep puncture was made in the swelling, with the sanction of a surgeon called into consultation on the point; nothing escaped but blood. The necessity of amputation was now apparent, and I removed the limb about the 6th of April. He died of bleeding on the sixth day, from the femoral artery giving way in the night. The end of the vessel was found completely open, the ligature with its knot entire lying in the stump. A medullary growth, soft and brain-like, filled a large excavation in the head of the tibia. It extended forwards to form the tumour, and backwards under the calf, just at the division of the popliteal artery, thus accounting for the pulsation in the early stage of the swelling, for the suppression of the pulse in the tibial arteries so long as the tumour was confined by the strong fascia, and its subsequent return when the disease was no longer bound down by this structure. The inguinal glands, which had been observed to be slightly enlarged, were diseased, and presented a marbled appearance

on section, from intermixture of white medullary matter with the natural light brown of the gland. One or two glands in the pelvis were diseased in a similar way; and there was a medullary tubercle in the thin edge of the liver as large as a gooseberry.

FUNGUS HÆMATODES OF THE FEMALE BREAST.

I removed the mammary gland of a lady, about twenty-two, in good health, on account of a firm tumour situated near the centre; it had not been observed long, and was free from pain; there was not glandular affection in the axilla. It is doubtful whether she would have resorted to surgical advice if she had not been engaged to be married within a short time, and then to accompany her husband to India. The disease was a deposition of medullary substance with small portions of coagulated blood, about equal to a large walnut, the gland being otherwise perfectly healthy. Her death occurred in India within two years of her departure from England, without suspicion of its having been connected with the former disease in the breast.

A married lady, forty-eight years old, of stout frame and healthy constitution, who had borne several children, having experienced some pain in the breast, and bleeding from the nipple, and also found a swelling in the part, consulted me on the subject. In the breast, which was large and otherwise healthy, there was a firm swelling, without retraction of the nipple or enlargement of the axillary glands. There had been discharge of blood from the nipple several times. I removed the entire gland. When it was cut through, a quantity of dark blood, not unlike treacle in colour and consistence, flowed out, having been contained in a cellular structure, which seemed to consist of vascular ramifications contorted and confused as in a nævus. In this was imbedded

a portion about equal to a filbert, of soft, reddish medullary substance, contained in a cyst, from which it was easily detached by the handle of a knife. The surrounding cellular substance was thickened and compact, so as to give the lump the firm feeling of scirrhus. No other disease was found in the gland.

Case of permanent recovery after operation.

The most remarkable case which I have seen of fungus hæmatodes affecting the female breast is that of a lady, in whom the operation, performed under circumstances all but desperate, was followed by complete recovery, which may probably be deemed permanent now after the lapse of eleven years without interruption or alarm. This lady, rather tall, dark complexion, and apparently healthy constitution, married, but without children, said that there had been some swelling of the right breast in early youth, for which plaster and medicines had been used. It was not further noticed till 1848, when the part was submitted to the examination of a practitioner, who, although he stated that it was of no consequence, and would soon be cured, employed various fomentations and medicines, and recommended generous diet, raw eggs especially, to keep up the constitution, which did not fail till the tumour began to enlarge rapidly, in September, 1850, when it was pronounced to be an abscess. In December appearances like boils began, with swelling of the face, tongue, and throat, till January, 1851, on the 31st of which month she represented that she broke down with extreme sickness, and was obliged to keep in bed entirely. I saw her in the beginning of February, when the first aspect of the disease and of the patient gave so strong an impression of utter hopelessness as required some time and reflection to counteract. There was a great

mass of disease in a truly frightful state, commencing at the very back of the axilla, including the right breast, enormously enlarged, and reaching over to the sternum. Excepting the axilla, where the skin was not affected, there was not a healthy piece of integument over the rest of the bulk. The distended and thinned skin was of a dusky red throughout, except over the central portion of the mass, where it had mortified, and now presented a large dirty gray slough, covering a quantity of semi-fluid, disorganizing structures; the rest of the mass had the softness of medullary disease, and the whole was so far movable on the chest as to show that there was no firm connexion at the base. The ignorant pretender to whom this lady had entrusted her health and life for three years had represented that the abscess, as he called it, was about to break, and that she would then be well. The pulse was very feeble, the powers of life being nearly exhausted by pain, want of appetite and sleep. The alternative was clear, certain death within a week, or an operation which might prove fatal. I mentioned my willingness to undertake the operation, as affording the only chance of prolonging life, but without guaranteeing its safety. The operation, under the influence of chloroform, carefully administered by Mr. Coote, was performed on February 8th, 1851, the long incisions and the detachment of the mass being executed as rapidly as possible, in order to limit to the smallest amount the inevitable loss of blood; and with the same object the surface was covered with lint firmly held on as fast as it was exposed. Brandy was given previously and during the operation, which was accomplished with little bleeding and hardly any suffering. The constitution was at once greatly relieved, rest being procured by moderate opiates, while fluid nourishment and stimuli were freely taken and well borne. On April 18th, recovery was sufficiently advanced

to allow of the air being taken in a carriage. I was aware that diseased parts had been left in the axilla and neighbouring side of the chest, as the condition of the patient would not have allowed the prolongation of the operation by what would have required careful dissection, and the exposure of a region which it is always desirable to avoid. The parts thus left seemed to come forward towards the surface, and were thus accessible in two minor operations, on April 23rd and May 27th; and a more considerable proceeding under chloroform was necessary on July 19th. The entire wound was completely closed by July 31st; and I had the pleasure of meeting the patient with perfect recovery of health, strength, and good looks, at the Exhibition of 1851, in August. She says that her health has been better since the operation than before, and the cicatrix, which I have seen within the present month (October, 1862), is in a perfect state. The enormous stinking mass removed by the operation was too much disorganized for satisfactory examination, but it presented the usual appearances of medullary disease, and had undoubtedly been entirely of that structure. The portions subsequently removed were of light pink colour, very soft, and closely resembling fœtal brain. The same kind of soft structure in small portions sprung up repeatedly in the part of the wound nearest to the axilla during its healing, so as to retard the process of cicatrization. This occurred not less than ten times. I scooped these out carefully with the end of a director, when not larger than a filbert, and rubbed the exposed surface thoroughly with nitrate of silver.

There must have been in the case of this lady a strong disposition to malignant disease. An elder sister died some years before my attendance, without having undergone operation, of disease in the breast with all the characters, as clearly described to me, of medullary cancer. A younger sister,

unmarried, had disease of both breasts, which I removed in succession. The character of the affection was not so strongly marked as in the former case. There was general change of structure throughout the gland, which could only be referred to the fungoid class. The right breast was removed on June 7th, 1851, the lady being then forty-four. A soft swelling, the size of a large walnut, was removed from the axilla in July, 1854. The left breast was removed in January 2nd, 1855, the parts on the right side remaining perfectly sound. She died from erysipelas and exhaustion on the 13th of the same month. The uterine functions were performed regularly in both ladies during the whole of their illness.

The preceding case is calculated to impress a caution against pronouncing absolutely that a case is malignant and necessarily fatal under circumstances that may admit of doubt, and then refusing to give the patient the chance of an operation which might prolong life for a longer or shorter time. These points are strikingly illustrated in a case of serious disease in another quarter, which was under my care in St. Bartholomew's, in 1851. The following narrative was drawn up by Mr. Edmund Archer, my house surgeon, who had the immediate charge of the patient:

Case of disease in the right superior maxillary bone, extending across the bony palate, and ending in a considerable swelling on the corresponding bone of the left side.

H. J—, æt. 22, a robust, healthy girl, was seen at the surgery of St. Bartholomew's, in February, 1850, with a small circular livid growth, occupying the interspace of the two upper bicuspid teeth on the right side, and involving also the gums immediately adjacent. It was freely removed, and caustic was applied to the exposed surface. Healing took place rapidly, and no appearance of reproduction oc-

curred until several weeks after, when the cicatrix was found to have assumed the same livid hue as the original growth had exhibited; the suspicious spot was, therefore, a second time excised, and a portion of the alveolar border of the upper jaw was removed by cutting forceps, the potassa fusa being at the same time freely applied. Cicatrization again took place, but more slowly. The part remained, however, without any appearance of reproduction until the expiration of nearly six months, when she was admitted under the care of Mr. Stanley, by whom the livid cicatrix was once more removed, and the subjacent surface of bone carefully scraped. She remained several months in the hospital, during which the growth rapidly returned, involving now the right antrum, and also a portion of the left superior maxillary bone. Nearly all the teeth in the upper jaw became loose; a considerable projection occupied the right cheek, corresponding ala nasi, and the hard palate on both sides. The cavity of the right nostril, and the nasal duct, were completely obstructed, and the glands beneath the jaw were enlarged. The orbit was not involved. Consultations of the surgeons were frequently held on the question of operation, as the patient was very solicitous for its removal at any risk. The unanimous opinion was against the proceeding, partly because the disease had spread over the palate and formed a firm swelling on the left side of the mouth, and partly in consequence of two small, moderately firm swellings, apparently connected with the bone, which had formed at the vertex of the skull. At length the poor girl left the hospital on February 3rd, 1851, and sought assistance at other institutions, the surgeons connected with which are not ordinarily remarkable for timidity in operative surgery; but no interference was deemed expedient. On February 13th, 1851, she was re-admitted into St. Bartholomew's,

under the care of Mr. Lawrence. The case was again carefully considered by the surgeons of the hospital, and by several eminent foreigners, both continental and American, amongst whom were M. Roux of Paris, and Dr. Warren, of Boston, all of whom concurred in the opinion that the disease was malignant, and that any operation must be utterly useless. The swelling in the right cheek is now about as large as half an orange; the lips stick together during sleep, a bloody discharge issues from the right nostril, especially in the morning. From time to time three loose teeth have been extracted from the upper jaw, and on each occasion nearly half a pint of blood has been lost, with marked but temporary alleviation. The swellings on the head are no longer perceptible. Complete despair now seemed to have taken possession of the unhappy patient; advice and remonstrance were alike unheeded, and she had determined on self-destruction, unless some operation could be undertaken. Once more the several circumstances of the case engaged the serious attention of Mr. Lawrence, who, still considering, in concurrence with all who had seen the case, that the removal of the entire disease was altogether impracticable, turned his attention to the great and increasing size of the original mass, which already filled the mouth, so as to render feeding difficult and painful, and almost to prevent articulation; and he came to the conclusion that it was not only justifiable, but almost necessary to take away that part, although the free bleedings which had followed the extraction of the teeth created some anxiety respecting the larger hæmorrhage that must attend the operation. He therefore determined to comply with the urgent solicitations of the patient by removing that part of the disease which included the right upper jaw-bone, excepting its orbital portion, which was unaffected, and to leave the left

half behind. This would at least relieve the patient from the present increasing annoyance of the large and offensive mass in the mouth, and afford opportunity for observing the further progress of the affection, deferring the consideration of the entire extirpation of the disease, in the event of its proving non-malignant, until amendment in health and spirits might enable him to undertake the task with less fear of so dreadful a result as death on the operating-table.

In the operation performed on May 25th, the patient, having been placed under the full influence of chloroform, an incision was made extending from the malar eminence to the angle of the mouth, and dividing the whole thickness of the cheek. The flaps were then dissected in either direction; the connexions of the superior maxillary bone were divided by bone forceps, and the bone, with the diseased growth, was removed. Alarming hæmorrhage occurred during the operation, nor was it until some hours afterwards that the state of the circulation was sufficiently recovered to warrant us in regarding her without feelings of serious apprehension. She was placed near an open window, cloths wrung out of cold water were lightly and suddenly thrown on the chest, the part being afterwards quickly rubbed dry, hot bottles were applied to the feet and axillæ, and she was assiduously plied with brandy and ammonia. At four o'clock a hare-lip needle with twisted suture was used at the angle of the mouth, and the rest of the wound was closed by four interrupted sutures. At eight o'clock warmth had been restored, but the pulse remained extremely feeble and frequent.

Two days after the operation, slight inflammatory swelling appeared round the wound. She was thirsty and feverish; pulse frequent, 128; bowels were constipated. Six leeches were applied with marked relief. The bowels acted several

times, after a dose of castor-oil. The sutures were removed on the fifth day, when the edges of the wound were united throughout, and the feverish symptoms had entirely disappeared.

She left the hospital July 9th, 1851, with the wound firmly united, the aperture in the roof of the mouth much reduced in size, and interfering but little with articulation by the insertion of a piece of moistened bread into the orifice. There was not any increase of the disease on the opposite side.

When the patient went home, the morbid deposit still remained in the palate, and there was a firm, round tumour, equal in size to a large walnut, closely connected to the outer and back part of the left superior maxillary bone, and projecting into the mouth. These relics of the malady, which caused neither pain nor inconvenience, lessened very slowly, and at last entirely disappeared. She was fitted with a plate bearing a regular row of upper teeth; mastication and articulation were perfect, and no trace of the disease or operation was observable, either within the mouth or externally. Very close inspection was necessary to discover the line of the cicatrix in the cheek and upper lip, and I had some difficulty in making it out. The morbid growth in this case possessed great vascularity and rapidity of growth, and it had consequently spread to an alarming extent within a short time. It had been seen and examined by many surgeons, both foreign and English, who had unanimously pronounced it to be malignant, although the result of the operation showed that this opinion was incorrect.

To the last two cases of operation, performed with successful result, under the most discouraging circumstances in the presumed nature of the disease, it will be instructive to subjoin an instance of precisely opposite character, in which a dangerous and inevitably fatal secondary disease has

appeared after the removal of a part to which not the slightest suspicion of malignant character could attach. A man, about forty-five, who had always enjoyed good health, his occupation through life having been agricultural, came into St. Bartholomew's under my care, for an enlargement of the right tonsil, presenting the usual character of hypertrophy, and obviously requiring excision, an operation which I had never performed, except on much younger subjects. The only complaint was of some difficulty in swallowing, apparently dependent on the enlargement. This was rather beyond the bulk that could be passed into the opening of the so-called guillotine, usually employed, in the operation. I therefore cut off as much as protruded, with the effect of remedying completely what had been complained of. The part removed was simply hypertrophied tonsil. He returned to the country, with a strict injunction to come back if any further inconvenience should be experienced. He came to the hospital again in the month of October, with a swelling as large as an egg, proceeding from the former site, and seeming to fill the pharynx, so as to produce a formidable impediment to the act of swallowing. This I removed with the ecraseur, getting the loop of the chain over the lower end of the swelling, which was at some distance below the tongue, drawing up the ends, so as to include the root of the mass, and then fixing them to the movable branches of the instrument, the action of which caused so much choking feel and involuntary efforts of the surrounding parts, that it was necessary to hasten the process, which was accomplished almost without loss of blood. The part removed appeared as an entire tonsil, simply enlarged by hypertrophy, with slight surrounding covering of cellular tissue in a perfectly natural state. The section presented a substance of very light brown tint, similar to that of the natural

gland, and in a lobular arrangement. Mr. Savory reported that a most careful microscopical examination detected nothing but gland elements. This patient came once more to the hospital in July of the present year, with a swelling apparently glandular, larger than my fist, under the right sterno-mastoideus, of firm but not scirrhous hardness, and covering closely all the important structures at the side of the neck up to the angle of the jaw. It was not painful, and had not been so during its increase, which had been rather rapid.

My colleagues and myself regarded this swelling, which had attained its great bulk within a few months after the removal of a primary disease, as a malignant affection, deciding, at once and unanimously, that it was not a fit case for operation. If it could have been considered merely as an innocent affection, I should not have hesitated to attempt its removal, although the operation would have been formidable and dangerous to life at the time, besides being very doubtful in its result. Considered as a secondary fatal tumour consequent on a primary disease, to which no suspicion of malignancy could be attached, it is of no slight practical importance. The diseased structure of two mammary glands, excised in cases of which the details have been previously related, was pronounced to be perfectly innocent after careful examination, including microscopical scrutiny by persons of competent experience and judgment. Yet in one of these (p. 532) hard scirrhous knots formed in the neighbourhood of the cicatrix three times, while on one occasion the latter and the subjacent structure were indurated, so as to require removal; while in the other (p. 534) an enormous mass of disease formed within a short time, and filled the abdomen and the neighbouring inguinal and femoral regions on the side opposite to that of the diseased breast. These three cases show us that the character of malignancy may exist when no

traces of nucleated cells are to be found; so that, however interesting these bodies may be in a pathological point of view, they afford little, if any, assistance in deciding practical questions. The unfavorable result of these three cases is the more puzzling when contrasted with the unexpected and permanent cure which occurred in the case at p. 606, and more particularly in that at p. 603, in which all the characters of fungus hæmatodes were seen in their most unequivocal form.

CHAPTER XXI.

MELANOSIS—OSTEOID CANCER.

Melanosis, a greek word of the same spelling, from μελαινω, to blacken, might be equivalent to black disease in English. It is a malignant affection, analogous in consistence to fungus hæmatodes, but strikingly distinguished by its colour, which is that of the deepest sooty blackness, owing to the intermixture with its texture of pigmentary matter like that of the choroid membrane of the eye, or of the rete mucosum of the black races. It is sometimes seen in dark tints of blackish brown or gray, and even in lighter shades of those colours. It differs from the medullary disease, inasmuch as it has been seen in the primary form only in the skin and the eye, so far as my own experience goes. In the latter organ, instead of occurring like medullary disease in early life, it is not seen before adult age. Its secondary manifestations are more numerous than even in cases of fungus hæmatodes.

In the skin it has frequently begun in one of the congenital malformations known in common language as moles, being slightly elevated portions of integument, of brownish or darker colour, smooth or uneven surface, classed among nævi, and owing their colour to the admixture of pigmentary particles. These moles usually continue unchanged through life, but they may if somewhat large, swell and become

painful. The surface may be fretted, by rubbing of dress, into a sore, with painful and occasionally bleeding fungus, and then with melanotic degeneration. This is followed by secondary swellings in the neighbourhood, and gradually in important internal organs, with inevitably fatal termination. I saw a case during life, and witnessed the examination after death under the care of Mr. Langstaff, who has given a detailed account of it in the third volume of the 'Medico-Chirurgical Transactions.' It began in a large mole on the shoulder, which had swelled and become troublesome, being of dark, bluish-red colour, and about three quarters of an inch in circumference. It was excised and found to consist of a firm, purple vascular mass growing from the cutis. There was much bleeding, and the part healed slowly. Two tumours had formed in the axilla, and rapidly increased after the operation, forming at last a swelling which weighed four pounds after death. Four other tumours formed in different parts, one in the neighbourhood of the inguinal glands. The integuments of the great axillary swelling became very thin, and sloughed, giving issue to dark blood and ichor.

Protuberances of the surface had been occasionally punctured, with more or less copious escape of dark blood, and great relief. No pain was complained of for a considerable time, but it came on gradually and increased to the severest suffering, consisting of excruciating and darting sensations in the swelling, in the side of the neck, and along the arms, under which life sometimes seemed to be giving way. Death occurred at the end of five months. The external surface of the swelling was an aggregation of dark-coloured tumours, varying in size, but not large. Some of these consisted of soft medullary substance like brain, with coagulated blood, others of the same consistence but dark gray, and a few were blackish. The fluid expressed from the latter was like the black

pigment of the choroid coat, or that of the bronchial glands. The liver was filled with tumours throughout, and the lungs were diseased in the same way; two tubercles were found in the pancreas; there was one in the sternum, one under the pericranium on the top of the head, and a third on the dura mater, under the occipital bone. This case exemplified what has been seen on other occasions, namely, the origination of the complaint in a mole, and the combination in the morbid growth of the melanoid with the ordinary medullary disease, both being equally soft in consistence.

I have seen it beginning in the texture of the skin as a dark blue and almost black circular spot, about the size of a split pea, round which other similar spots have gradually formed at short distances.

A case very remarkable for the number of melanotic tubercles during life, and the still more abundant development of the disease after death, was treated and examined by Dr. Norris, of Stourbridge, in 1817, being, so far as I know, the first description of the affection in this country. It is fully detailed in a collection of cases published by him in 1857. The patient, aged fifty-nine, of light hair and complexion, was in apparently good health when first seen on account of a deep brown tumour on the abdomen, which had arisen from a mole; it was ulcerated, and discharged a fetid ichorous fluid. Several brown nodules of similar structure had sprung up around it. This tumour, half the size of a hen's egg, was excised, and the part slowly healed. In less than six weeks the tumour began to grow again from the surface of the cicatrix, and a great number of livid tubercles appeared around it, forming a mass of disease resembling a large bunch of black grapes, extending completely across the abdomen. The inguinal glands were swollen and tender. Health was tolerably good, and the patient was able to take

exercise and attend to business. Dark blue spots arose in the vicinity of a mole on the sternum; others appeared in succession on the side and back, and subsequently on the forehead and scalp. Great and increasing pain came on, followed by general dropsy, cough, and dyspnœa, under which he soon died. The original tumour was dark brown throughout; the second, though resembling the first during life, exhibited a true melanotic appearance after death; both were of firm consistence. On puncturing several of the tubercles, a thick black fluid was discharged from them. "When," says Dr. Norris, "the abdomen, chest, and cranium were thrown open, it was a most extraordinary phenomenon: thousands upon thousands of coal-black spots, of circular shape and various sizes, were to be seen closely dotting the shining serous, mucous, and fibrous membranes of most of the vital organs; I should think the most dazzling sight ever beheld by morbid anatomists."

Besides disease in all the abdominal viscera except the spleen and bladder, there was a great mass in the loins, from which flowed many ounces of dark fluid, like tar. The lungs were diseased throughout, and minute deposits of melanotic matter, from the size of a pin's head to that of a pea, were found in abundance under the lining membrane and in all the muscular structures of the heart. Some minute black spots were seen under the lining membrane of the superior cava. Deposits were found on the skull-cap, and the dura mater was studded with them. The brain was not affected, nor the extremities, with the exception of a speck in the leg.

Dr. Norris states further, respecting this patient, that his father had numerous tubercles at the back of the neck, not melanotic; that they were cauterized, and that he soon died; that his daughter came from Wales with a hard cancerous kind of tumour of the breast; that his eldest son had an

enlarged cancerous kind of lip and mouth, and went to Jersey to die; that a younger son had many moles, one in exactly the same spot where the disease in his father had originated, and that he had two brothers, both of whom were marked with numerous moles.

Causes.—On this point we are as much in the dark in the case of melanosis as in that of fungus hæmatodes and cancer. Dr. Norris, who has seen many instances and paid much attention to the subject, having also lived in the midst of coal and ironworks with the unwholesome atmospheric influences to which they may be supposed to give rise, offers the following remarks on the subject:—"Most of the cases I have seen of the disease, and many of those reported by acute morbid anatomists, have occurred to patients residing in very smoky iron and coal districts, where iron manufactories abound, and the air is constantly polluted by volumes of black smoke; or in large towns such as London, Manchester, &c.; or in men who have smoked immoderately; and in the wives and daughters of those, who living in the same apartments, have inhaled fumes of tobacco from parents or husbands."

Treatment.—All the cases of cutaneous melanosis that I have seen have terminated fatally. The only chance of preserving life is by free extirpation at the earliest period, indeed under circumstances of suspicion, with a view to prevent the development of this hitherto fatal malady. If therefore a mole, having been previously quiet, as they usually are, should pass into an active state, swelling, changing colour to a darker tint, becoming painful or uneasy, and more particularly if the surface should become broken, either spontaneously or by external cause, it should be immediately removed with a good margin of sound skin. Should a dark blue or black spot appear in the skin, the same course should

be taken without delay. Dr. Norris, however, relates an exceptional case, the only one that I know of, in which a melanotic disease was removed by himself with permanent success. It occurred in a young woman of twenty-six, of fair and freckled complexion, thin and delicate form. Three years previously, a mole situated between the shoulders had been wounded by the blade of a pair of scissors for the purpose of removing it. A dark brown stain subsequently surrounded the mole, which had begun to increase twelve weeks before Dr. Norris saw it, when he characterised it as the most perfect specimen of melanotic tumour he had ever seen. It was as large as a moderately sized mushroom, oval and flat, soft and elastic, and attached by a thick pedicle. There was a small tumour the size and colour of a black grape at its upper surface. The part was removed with abundance of the surrounding substance. When Dr. Norris published this with other cases in 1857, the patient had continued well for eight years.

The origin of the mischief from the accidental injury of a mole and the neglect of early measures were seen in a Cornish gentleman, fifty-three years of age, who had on the left fore-arm a small mole with long hairs growing on it, which he had hurt by friction with a flesh-brush a year and a half before I saw him. A person to whom he showed it said it was a bleeding wart and tied a silk thread round it. A small swelling came in the skin after the mole had dropped off, and there were warty appearances around it. This was freely removed by a surgeon, as well as a small swelling which formed in the scar of that operation. When I saw him there was a cicatrix about two inches long over the radius, and about its middle a firm swelling as large as a nut, a similar swelling over the ulna, another just above the internal condyle, with another as large as a pigeon's egg,

apparently of the neighbouring gland, a larger swelling in the axilla, and a firm tumour in the skin of the opposite axilla. The patient had always enjoyed good health, and was quite well when I saw him.

MELANOSIS OF THE EYE.

The primary seat of this affection is probably in the choroid coat; it is certainly between the sclerotica and the retina, which suffer at first merely from pressure of the morbid growth. Where the melanotic substance is deposited, the choroid cannot be traced, but it is seen, of natural appearance, lining the sclerotica, in the part free from disease. Although no trace of melanotic degeneration in the optic nerve had been observed in either of the two cases subsequently related, that nerve was discoloured in the second, and the dark tumour within the cranium was probably connected with the continuation of the same cord. In a case which I examined after death many years ago, where the contents of the orbit had been converted into a mass of disease nearly black, the same structure was continued through the foramen opticum, and connected with a large deposit of similar colour at the base of the brain.

By the operation of excision before the morbid deposit has pierced through the coats of the eye, life may be prolonged for an uncertain period, of which four years may be the outside, but it is doubtful whether the success has been permanent in any case. I operated some years ago on a young Irishman, under thirty; he recovered quickly, and I saw him in good health more than a year afterwards: he promised to return to the hospital if anything should happen to him. I have neither seen nor heard of him since, but do not thereby conclude that he is still living. The longest period of safety,

within my own experience was in a case which will follow. At the urgent request of the patient, who was willing to undergo a serious operation as a relief from intolerable suffering, I removed the contents of the orbit in so advanced a stage of the disease that there was no distinguishable portion of the eye left in this protruding mass, from which a somewhat thick fluid escaped in considerable quantity. There was a small, shrunken sclerotica, with some black matter. The front of the bulk was an irregular broken and black surface, which passed off by gradual intermixture into a mass of moderately firm medullary disease. Death followed on the tenth day; the liver was filled throughout with deposits chiefly of melanotic character.

The two following cases exemplify the nature, progress, and serious results of this formidable malady.

Case. I.—*Melanosis of the left eye; extirpation of the globe at an early period; death in three years and three quarters after the operation, from secondary disease of the liver, pancreas, ovaries, and other parts.*

E. R—, a female, of rather stout frame and healthy appearance, who had always enjoyed good health, was admitted into St. Bartholomew's, October 7th, 1841, as a venereal patient, on account of superficial ulcerations and mucous tubercles of the external organs. She said that her age was twenty, but she was probably two or three years older.

A few days afterwards, she called my attention to the state of her left eye, of which she had made no complaint at the time of admission. It was red, watering, and painful, and presented serious changes in the state of the iris and lens. It appeared, on inquiry, that six months before, without previous suffering, she had discovered accidentally that she was blind

on that side. She experienced no inconvenience, until three months after, when pain came on in paroxysms so severe as to induce her to become out-patient at the Ophthalmic Hospital in Moorfields. She discontinued her attendance after two months, in consequence of her confinement, during which time the paroxysms were less frequent and severe.

We found the conjunctival vessels and those of the sclerotica slightly injected; the cornea transparent; the iris dark-coloured, dull, and motionless; the pupil widely dilated; the crystalline lens of a dull, dingy hue; both iris and lens were in contact with the cornea. Three small staphylomatous projections, one above and two below the middle of the globe, occupied the outer part of the sclerotica, close to the edge of the cornea; large tortuous vessels, of venous character, ran over the two lower. Vision was totally lost; there was constant pain, which was occasionally very severe. The suspicion of melanosis immediately occurred to my mind. The presence of a morbid growth in the back of the globe would account satisfactorily for the changes of appearance and position in the iris, pupil, and lens, as well as for the partial absorption of the sclerotica. Leeches were applied three times to the left temple, with benefit; but the pain was not entirely removed.

As the appearances above described might be accounted for by the formation of fluid within the globe, although I did not think it probable, I punctured one of the staphylomatous projections with a grooved needle; no fluid escaped. Entertaining no further doubt respecting the nature of the complaint, I explained to the patient the necessity of the operation, to which she readily consented. The globe was extirpated on the 23rd of October, 1841, the lids being separated by a free incision at the external commissure, and

turned backwards, so as to expose fully the front of the orbit, and the posterior connexions being divided as far back as could be accomplished conveniently.

Examination of the eye.—The globe, not unnaturally soft, was divided through the centre. There was no trace of vitreous humour; a dark and blackish mass, of soft consistence, occupied nearly the whole interior of the globe, pressing the retina, which was healthy, and formed a flattened mass, towards its inner side, and the crystalline lens, which was semi-transparent, against the posterior surface of the cornea. During the examination, the diseased mass dropped out from one half of the section, leaving the inner surface of the sclerotica smooth, but slightly darkened in colour. In that part of the globe which was occupied by the diseased mass there was no trace of choroid membrane, and the growth therefore, filled the space between the sclerotica and the retina, which was folded into a small compass. That portion of the sclerotica towards which the retina was pressed was lined by healthy choroid. The optic nerve was healthy. The eye is preserved in the museum of the hospital.

There was but little subsequent bleeding; no vessels were tied. Four hours after, she had cold chills, and vomited several times. She quitted the hospital, well, on December 6th.

September 6th, 1842.—She was seen in good health; there was no return of disease in the orbit. From the time of her leaving the hospital she was in a laborious situation as domestic servant, and remained well to the latter end of 1844, when she called upon me, complaining of pain and fulness in the abdomen. Suspecting that internal disease might be forming, I advised her to leave her situation, and to come into the hospital.

December 12th.—There is a small swelling on the right side of the navel, covered by healthy skin, of which the

appearance is slightly altered by the dark colour of the subjacent growth. There is general fulness of the abdomen on the right side and upper part. The liver is enlarged and uneven on the surface, extending below the margin of the chest. Towards the confines of the lumbar and iliac regions there is a tumour on each side, somewhat movable, of indefinite size and extent. Pain is experienced occasionally. The several functions of the body are performed naturally, but she sleeps badly.

March 13th, 1845.—The disease has been making rapid progress. Five dark-coloured, subcutaneous tumours, the size of nuts, can be counted upon the chest, and in the right mamma. The abdomen, which equals in size that of a woman at the full period of utero-gestation, is distended laterally by the enormously enlarged and tuberculated liver, below which other masses may be felt. With the exception of menstruation, the different functions are properly performed. She is collected in mind, and suffers pain, either in the head or abdomen, at times only; in the intervals she is quite easy. Small blisters and mustard plasters on the abdomen afford temporary relief. The disease advanced steadily, attended by occasional pains either in the head or abdomen, and eventually by purging of blood, at times in considerable quantity, until June 6th, when she died.

Mr. Coote has drawn up the following account of the examination after death:

There were two or three small, black tumours in the scalp; the scull-cap, thicker and heavier than natural, contained in the diploë, similar deposits, each about the size of a large pea. Black matter was found about the optic foramen, in the lesser ala of the sphenoid bone, and along the inferior margin of the left orbit. The bony substance was not

swelled, nor apparently altered in structure, in the situation of these deposits.

The brain was healthy; there was a small, black spot lying upon the surface of the anterior cerebral lobes under the pia mater. The left optic nerve, from the orbit up to the commissure, was shrunk into a slender membranous cord, without trace of nervous matter; the state of atrophy was continued in a slighter degree along the right, or opposite optic tract, into the optic thalamus.

There were five dark-colored, spherical tumours, about the size of nuts, visible through the integuments of the chest, situated chiefly about the right mamma. Three similar tumours were noticed under the integuments of the abdomen; they were loose and seated in the cellular tissue; some were firm and black, others of a brownish hue, consisting of thick fluid contained in a cyst.

Black matter was deposited in the cancellous texture of some of the left ribs; a mass of black matter the size of a musket bullet was lodged upon the anterior surface of the dorsal vertebræ.

The lungs were healthy.

There were numerous black tumours upon the outer and inner surface, and in the muscular substance of the heart; two of considerable size projected into the cavity of the left ventricle.

The liver, enormously enlarged, seventeen and a half pounds in weight, occupied the greater part of the abdominal cavity; although much of the surface presented the natural colour, consistence, and organization of the hepatic substance. The enlarged gland consisted principally of a morbid deposit, in larger or smaller masses, which occupied the entire thickness of the organ, and projected from the surface in rounded tubercles of various magnitude and generally of black colour.

In the interior the colour varied from a deep black to a light yellowish brown. The consistence varied; it was generally softish, so as to break down under the pressure of the finger. When passed over paper, linen, or the skin, a black or brownish colouring matter was left behind; the morbid substance was contained in a kind of cyst, from which it could be turned out. The larger masses presented a slight lobular arrangement on section.

The gall-bladder was healthy, and contained bile.

Upon the mucous membrane of the jejunum were seen several small black patches; larger patches were found in the fold of the mesentery, and on the peritoneal covering of the pancreas.

The pancreas was filled with numerous deep, black deposits of irregular form, some as large as a musket bullet.

Smaller deposits were found in the kidneys; two cysts, resembling in size and shape the human testicle, each containing a mass of black matter, were attached to the right kidney. The uterus was healthy.

The ovaries were greatly enlarged, and converted into irregular, lobulated masses, about eight inches in length which retained no trace of natural structure; each of these masses consisted of a thin but dense cyst, filled with melanotic structure, of soft consistence, and of the deepest black colour. The ovaries, with the uterus, are preserved in the Museum of the Royal College of Surgeons of England.

Some minute black spots were seen upon the mucous membrane of the vagina, near the os tincæ.

The blood-vessels were healthy.

Under the microscope this morbid deposit was found to be composed of irregularly shaped cells, of larger size than in common medullary disease, and containing dark granules, varying in quantity according to the colour of the part.

In those parts which were soft, and brownish in colour, the cells had given way, and allowed the granules to escape. The granules had everywhere a kind of molecular movement.

Case II.—*Melanosis of the right eye; extirpation of the globe; death at the end of six months from melanotic disease within the cranium.*

S. K—, æt. 43, married, of spare habit, and swarthy complexion, but of healthy family, and the mother of six healthy children, never suffered from any illness until two years ago, when, without obvious cause, the right eye became inflamed, the lids swelled, and vision was lost. The inflammation subsided readily under proper treatment, but the sight did not return. Her friends, however, remarked that the eye had a more bright and glistening appearance than the other, and seemed the best of the two. About nine months ago, she had severe pain in the globe, which induced her to examine it in a glass, and on raising the upper lid, she discovered a black spot in the white part. This slowly increased and projected slightly till about eight weeks since, when it grew more rapidly, pushing the eye downwards behind the lower lid. For three months after the discovery of the black spot she was free from pain, but it then occurred in paroxysms, increasing in frequency and being particularly severe at night. Yesterday (January 9th), the tumour began to bleed.

January 10th, 1845.—There is a dark-colored tumour, the size of a walnut, with four black, tubercular prominences, protruding from the upper part of the right eye, partially covered by the upper lid, which is stretched over it, and rests in a groove on its upper surface. The portion exterior to the lids, directed outwards, is ulcerated, and bleeds freely when touched. In every other part the conjunctiva is entire, but

its vessels are large and tortuous. The development of this tumour above the eye has pushed the globe downwards and outwards. When the lids are separated by voluntary effort, the palpebral aperture is entirely occupied by the morbid growth. On depressing the lower lid, the cornea is brought into view quite transparent, but pushed down to the very lowest part of the orbit. The iris is unaltered, and pressed against the cornea, together with the lens, which is discolored and opaque. Vision in the opposite eye is perfect; appetite good; no disease is apparent in any other part. The history of the case, with the appearances just detailed, left no doubt that melanotic disease had formed within the eye, and had made its way through the coats at the upper part of the organ, so as to constitute the dark tumour which projected between the lids. Extirpation of the diseased organ offered the only prospect of benefit.

January 11th.—The operation was performed in the usual manner. There was some trouble in separating the upper lid, which was tightly stretched over the tumour, but the globe was satisfactorily removed. The cut surface of the optic nerve presented a dark discoloration in slender streaks; as it had been cut through close to the sclerotica, it was thought advisable to take out another portion. Some discoloration was noticed in the situation of the second division. There was no bleeding of consequence; no vessels were tied; wet lint was placed over the orbit, and the patient was carried to bed.

Upon making a vertical section of the eye and tumour, it was found that a morbid growth, of soft consistence, and brownish colour, with black portions interspersed, had proceeded from between the sclerotica and choroid in front of the optic nerve, and pushing forwards the iris, which was healthy, and the lens, which was opaque, against the cornea, had made

its way through the upper part of the sclerotica, just behind the ciliary ligament, and formed a tumour the size of a walnut, covered by conjunctiva. A shred of retina was discovered among some loose fibrous substance. No trace of choroid was seen, nor of vitreous humour, although the morbid growth did not fill the interior of the globe.

No unfavorable symptom occurred after the operation. The swelling of the lids subsided when suppuration was established; the wound healed, and she was discharged in perfect health on February 3rd. The unfavorable result of the case, however, is apparent from this portion of the brain, which has been forwarded to us by Mr. S. Freeman, of Stowmarket, the gentleman who attended her at the time of her death, which took place in the early part of this month (July), after a few days' illness. Within a week of her decease she had been able to walk a distance of fourteen miles.

The brain, as might be expected in warm weather, reached us in a state not admitting minute examination; you see, however, a mass of black matter the size of a large walnut, in a kind of cyst at the base of the brain behind the orbit, pressing the left optic nerve and stretching the commissure. The carotid arteries are imbedded in its substance; the right is pervious, the left apparently obliterated at one point. The growth is partly of a grayish-brown colour, and partly black, and resembles the original disease in the eye. The soft parts remaining in the bottom of the orbit were sent with the brain; the remnant of the optic nerve formed a firm mass, with dark streaks in its substance, about as large as a small horsebean. The remaining portions of the other orbital nerves were healthy.

The thorax and abdomen were not examined.

OSTEOID CANCER.

Osteoid Cancer.—Although the external and obvious characters of structure in the bones appear, on first view, not only different from, but directly opposite to, those of the softer parts, the pathology is essentially the same in the two cases. This is seen in the repair of injuries, in the causes, progress, and nature of morbid affections, and particularly in the liability of the bones to cancer and fungus hæmatodes, both primary and secondary, as well as to melanosis in the latter form. This pathological correspondence is carried still further by the circumstance that the bones give rise occasionally to diseased formations, in which bony structures and cancerous elements are intermingled in various proportions, fibrous or fibro-cartilaginous materials also being sometimes present at the same time. Such growths spring from the surface of the bone, the femur most frequently, and surround it, the medullary cavity participating in the disease sooner or later. They are distinguished from exostoses and fibro-cartilaginous tumours, which they resemble in position and firmness, by growing rapidly and with pain, which is often so considerable as to affect the health. The disease involves all the lymphatic glands in the course of absorption, which are enlarged and converted into hard masses of the osteoid disease, and ultimately disease is developed in the internal organs, more particularly in the chest. In some instances the disease has advanced slowly and without pain for several years, and has then assumed a more active form. The result of amputation, which had been performed in many instances, has been invariably fatal.

Osteoid cancer is an appropriate denomination for this disease, of which cases are related by Mr. Stanley, under the name of malignant osseous tumour; while the subject is con-

sidered with greater detail, both anatomical and pathological, by Mr. Paget.

In a case which occurred under my own care in the hospital, and has been described by Mr. Stanley, a tumour composed of soft fibrous and dense osseous substance completely surrounded the lower part of the femur. The whole series of femoral, inguinal, and lumbar absorbent glands were converted into osseous tumours, identical in structure with the swelling round the femur, both being composed almost wholly of a solid, dull white, chalk-like osseous substance, which in the femur was continuous with a similar deposit in the medullary and cancellous structure of the bone.

I am indebted to my friend Mr. Savory for the following case of osteoid cancer now under his care as the present sheet is passing through the press. It is so clear and full, without prolixity, that I should have been happy to adorn my work with other equally instructive and interesting narratives from the same hand.

Case of Osteoid Cancer of the Femur.

A seaman, forty-five years of age, was admitted into St. Bartholomew's Hospital with a tumour which occupied the lower two thirds of the left thigh. It was of an elongated oval shape, and well-defined; the integuments were healthy, and moved freely over it. The tumour evidently involved the femur, and felt as hard as bone. Its bulk was greatest just above the knee-joint, and from this part it could be traced upwards until it appeared gradually to subside upon the surface of the femur, at a short distance below the greater trochanter. No enlargement of the femoral or other glands, or any disease elsewhere, could be detected. The man first became aware of the existence of a swelling at the lower part

of the thigh five years previously. For a long time it grew very slowly and with scarcely any pain, so that he was enabled to pursue his occupation, until within the last six months; but during that period it had rapidly increased, with much suffering, and at length, hardly able to walk, he entered the hospital. The thigh was amputated in its upper third, the femur being sawn through about two inches above the highest point where any enlargement of the bone could be detected. The sawn surfaces presented a natural aspect.

Upon dissection the tumour exhibited all the characters of osteoid cancer in a well-marked form. When the integuments were reflected the muscles investing the tumour were found pale and softened, wasted and degenerated; and here and there in their substance appeared small circumscribed portions of firm cancer. It was difficult with the naked eye to define the limits of the growth; it seemed to pass gradually into the adjacent muscles. The surface of the tumour was of a pale buff colour, firm, but easily cut with a knife. At a few lines below this, however, it became very hard, as hard as compact bone. A longitudinal section of the tumour made with the saw displayed its continuity with the femur; indeed the periosteum of the upper portion of the bone appeared to be lost over it. No distinction could be drawn between the lower portion of the shaft of the femur and the surrounding growth; the compact and cancellated structure being equally blended with the substance of the tumour into an extremely hard, dense, uniform osseous tissue. The unossified circumference of the tumour was composed of firm fibrous tissue, with cancer cells scattered irregularly through it. The structure of the more central ossified portion resembled that of ordinary bone.

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