rom the points at which they have been developed, and they still give rise to the formation of their characteristic tissue. Bone may be made to grow in various parts of the body, and its germs have formed bone-tissue even in the lung. Yet all these germs have apparently the same origin; and we must, therefore, conclude that as successive generations of germs are formed in one individual organism of complex structure, the power of *producing* different kinds of tissue-forming germs becomes more limited, although each still retains its power of infinite multiplication if the restrictions, under which its growth is normally carried on, be removed.

As development proceeds and more perfect structures are evolved, the tissues first formed, having served a temporary purpose, are removed. In the formation of some of the tissues of the higher animals, several series of textures succeed each other in regular order. The germs of the whole series have arisen from the same mass, but the development of each successive order of germs has led to the production of structures which materially differ from one another in properties, mode of growth, and chemical composition. It might be said that the conditions necessary to the growth of the first series become changed, and the resulting textures are modified in consequence; and that every successive alteration of the conditions under which the germs grow necessarily produces a modification in the character of the changes taking place in them. It does not seem that the first series of germs dies, after having arrived at the end of the natural period of its existence, and gives place to the next set; but, before the first series have ceased to grow, they are encroached upon by the increase of those which are to take their place, and are thus *destroyed;* the vital powers of those last formed being greater than the vital powers of those which preceded them. The first set may by their growth be removed to a great distance from the nutrient material, while perhaps the development of tubes carrying nutrient matter accompanies the increase of the latter; and thus material capable of being animated is freely distributed to them. But these supposed *altered conditions* have not been brought about by the influence of accident, nor are they due to mere external agents; but they result, so to say, from the changes which have been effected by the particles which preceded those whose development we are considering; the conditions which favoured the growth of the last having been induced by a previous series, and so on from the beginning; *internal conditions* resulting from the action of a preceding race of living particles being at least as necessary to the development of a structure as the external conditions of heat, light, electricity, etc.

These external conditions appear to act very differently upon different living structures exposed to their influence under precisely the same circumstances. The different results seem to be due to the different internal powers of the living structures which they have derived from preexisting structures of the same kind. In no case does it appear that any *essential modifications* of structure or altered order of changes or action, have been induced and maintained by altered external conditions. The *tendency* of actions, due to inherent powers, to repeat themselves in the same order in endless series, seems to predominate over, and to resist, the tendency which altered external circumstances may be supposed to exert in modifying the structure of tissues and the nature of the physiological changes, which characterise every kind of living structure. The power of repetition —in fact, the life of the structure—is destroyed by the altered external conditions to which it is exposed before these have produced the modified results expected, or, if I may so say, caused the changes to diverge from the direction they were originally made to take.

[*To be continued.*]

SCROFULOUS DISEASES OF THE EXTERNAL LYMPHATIC GLANDS:

THEIR NATURE, VARIETY, AND TREATMENT.

By P. C. PRICE, Esq., Surgeon to the Great Northern Hospital; the Metropolitan Infirmary for Scrofulous Children at Margate; etc.

III.—TUBERCULOUS DISEASE OF THE EXTERNAL LYMPHATIC GLANDS.

[*Continued from page* 144.]

II. Notwithstanding the most judicious and persevering resort to such therapeutical means as have been described, it very commonly occurs that tuberculous glands remain in a state of induration and enlargement for an indefinite period, and demand more direct surgical interference, on account of the disfigurement, inconvenience, and positive danger to important structures and functions, which they cause. But the adoption of such measures as will be presently discussed depends on certain conditions, which it is all important to bear in mind; for an injudicious employment of them not only frequently leads to indifferent results, but to consequences the opposite to those which the surgeon desired.

No precise rules can, however, be laid down, by which to regulate the kind of local treatment to be followed; although there are certain features in every case falling under notice, which, if duly appreciated, will enable the practitioner to select those means which are most appropriate. An acquaintance with the history and symptoms exhibited by slow, insidious, and obstinate tuberculous disease of the lymphatic glands, situated, for instance, in the neck, at once forbids a too speedy resort to definite measures; for it commonly happens that although, for a considerable period, only one or two glands in a particular region may evidence implication of a persistent character, others in closer or more distant relation will sooner or later assume similar morbid conditions.

This is particularly the case when the patient shows a marked tendency to tubercular disease of other organs.

Too great care cannot, therefore, be exercised in recommending a plan of treatment, which, even under apparently favourable circumstances, is not always followed with the wished for success.

When it is determined to destroy or remove one, two, or a limited number of glands, one or other of the following methods may be employed; but they ought never to be practised before recourse has been had to milder means, and to those measures which are known to improve the general health.

Experience has so thoroughly convinced me of the importance of attending to this recommendation, that I rarely suggest even the consideration of any ultimate local treatment ere I have made certain that milder and more general means have, after a fair trial, proved unavailing.

a. Caustics and Actual Cauteries. The destruction of obstinate tubercular glands by means of one or other of these agencies, is a practice which has met with admirers; but I much question not only its advantages but its propriety. An indurated gland, even admitting that tubercular infiltration has led to considerable alteration of the true glandular tissue, cannot be disintegrated and destroyed by means of caustics, without involving the integrity of neighbouring parts, and occasioning an amount of inflammatory disturbance which may prove constitutionally injurious. It is also questionable whether the ultimate results of this practice be so satisfactory as some authorities assert. I have seen very serious inflammation ensue from even a most careful use of caustics, applied in the way to be first described.

and have often had cause to regret that the subsequent processes of healing and cicatrisation have not been more perfect.

Several plans for the application of caustics have been suggested and followed from time to time. Some surgeons, after cauterisation of the integument covering the diseased gland, destroy the gland itself by means of strong escharotics, such as the Vienna paste, potassa fusa, nitrate of silver, etc. It need scarcely be said that such surgery is, as a rule, far from meeting with the approbation of those who make conservatism the standard of their art. The unnecessary destruction of healthy skin, the pain and nature of the injury, and the scar which remains, even if the diseased organs be effectually removed, at once discourage the adoption of a measure unworthy even of empirics. The same remarks apply with equal weight to the use of the actual cautery, as a means for destroying lymphatic ganglia thus affected.

b. Introduction of Substances into the Diseased Gland. Within the past half-century the destruction of obstinate tuberculous glands has been obtained by a process somewhat less coarse, and more effective, viz.—the introduction of certain substances into the gland itself, for the purpose of creating an amount of irritation sufficient to procure resolution, or to cause such destructive changes as lead to softening and suppuration.

Although this practice is not by any means, so far as I am aware, commonly resorted to by English practitioners, still on the Continent it has gained many supporters. Within the last few years, I have seen it pursued in some of the Parisian hospitals, in the following way:—The glandular tumour to be operated on is first pierced by a sharp thin-bladed knife, when a portion of the caustic to be employed is introduced into the cavity made for its reception. The caustics in general use are composed of various proportions of chloride of zinc, potassa fusa, nitrate of silver, etc., and made into sticks resembling those of maccaroni, by means of flour or starch with gum. In this way the caustic selected can be more conveniently applied than in its natural state. If it be desired to promote rapid softening and suppuration, several pieces of the caustic stick may be thrust into the tumour; but, as a rule, those who resort to this method incline to a less rapid destruction of the diseased organ, and from what I have seen, I believe it to be the wiser plan.

Instead of caustics of this nature, the *trochisques escharotiques de minium*, so strongly recommended by Baudelocque, may be employed. These substances are composed of red oxide of lead and bichloride of mercury moulded by means of paste into the form of ears of corn, and are used much in the same way as the caustic sticks. (*Op. cit.*)

My friend Mr. Hoffman of Margate, who has paid considerable attention to the treatment of scrofula in various forms, prefers inserting into the tumour to be destroyed a certain portion of *iodide of starch*, which rapidly exerts an effect partly discutient and partly destructive; and from the results of his experience it appears to be a proceeding worthy of adoption. My own experience is however, in favour of the *potassa fusa* when judiciously employed; for I have reason to believe that the after results are often all that can be desired. Besides these various substances, others devoid of any caustic properties, such as parched peas, etc., are sometimes introduced into diseased glands for the express purpose of inducing suppuration; and, in certain instances, the employment of them is followed with advantage.

Although the contact of strong escharotics is commonly followed by immediate destruction of the part to which they are applied, and, perhaps, by more or less direct irritation of surrounding healthy tissue, still it is astonishing to see how comparatively little excitement is generated by the introduction of a moderate amount of these caustics into obstinate glandular tumours. In one case I saw treated by a French surgeon of eminence, I anticipated, judging from the amount of caustic paste introduced into a glandular tumour situated in the neck, that the local disturbance would be extreme; but a daily acquaintance with the after-progress of the case showed what I have since corroborated in similar instances, that the dread of excessive action need not be entertained, provided requisite care be taken.

In three cases, in particular, which I some time since treated in this way, I had no cause whatever to dread the occurrence of undue disturbance in healthy parts, although the patients were not in the most favourable condition.

M. Lebert, although he has himself had no experience in this form of treatment, states that the elder M. Guersant, formerly of the Children's Hospital in Paris, found that the use of these caustics, especially of the chloride of zinc, did not produce a reaction so acute as he might have supposed. (*Op. cit.*)

The introduction into enlarged and diseased glands of small sized wires raised to a high temperature by means of fire heat, or the galvanic current, has been lately much spoken of. Having only occasionally resorted to this plan, and then merely for the sake of trying its efficiency, I am unable to offer any definite opinion regarding its positive value; but I think it not improbable that a discriminate resort to the galvanic wire will occasionally be found of service, as its application is unaccompanied with pain, and there results but slight, if any, subsequent disfigurement.*

c. The Knife. When tuberculous glands prove refractory to such means as have been described, and a resort to caustics, cauteries, etc., is deemed inexpedient, it is sometimes advisable, as a last resource, to recommend the use of the knife. But, before doing so, it is the duty of the surgeon thoroughly to acquaint himself, not only with the true condition and situation of the diseased glands, but with the constitutional diathesis and state of his patient; for, unless such knowledge be satisfactorily acquired, operative measures will not be followed with that success which might otherwise be anticipated.

The following conditions justify a resort to the knife for the removal of enlarged and obstinate tuberculous glands, ere any evidence of softening and suppuration is afforded. Firstly: When such glands are limited in number and superficially situated; when they have resisted all milder means of treatment, and their presence proves injurious to neighbouring important structures by exercising pressure on large blood-vessels and nerves, and causing impediment to the functions of deglutition and respiration. Secondly: When the presence of the diseased glands simply gives rise to deformity, and there exists no apparent impediment to their safe removal.

As was formerly observed, the lymphatic ganglia of the neck have a superficial and a deep situation; and although the glands composing each division may become involved with tubercle, the inclusion of the latter is generally accompanied with more embarrassing complications, and the treatment required is consequently more difficult, and often unsatisfactory.

It generally happens, as we have already seen, that when tuberculous disease has manifested itself in one, two, or more of the deeply seated lymphatic ganglia, and when medicinal and other means have failed, but a short time elapses ere the glands in close proximity become similarly affected. It is on this ground that a too

* Mr. H. Lobb, who has paid considerable attention to the treatment of various forms of chronic disease by means of galvanism, tells me that he believes considerable good is sometimes effected by its application; but that it is of most value when the glandular enlargement is dependent on simple inflammatory changes.

hasty resort to the knife is injudicious and unsurgical. When, however, there exists no direct impediment to the removal of one or more diseased glands placed near large vessels and nerves, the greatest skill is necessary. I have known extensive injury done to these structures in attempting to take away a cluster of tuberculous glands; and it is by no means unusual for the surgeon to find increasing difficulties presenting, the further he proceeds with his dissection; and instances are recorded in which the number, size, and position of the glands, which had become fused into a mass, compelled an abrupt discontinuance of the operation.

In a former chapter I have alluded to one such occurrence; but, fortunately, cases of this description are comparatively rare in the hands of practical surgeons. When, however, nothing short of operative measures will succeed, they must be proceeded with in the same way as is recommended for the removal of non-glandular tumours which are deeply seated, and in relation with important structures.

No matter to what size the glandular swelling may have attained, it is seldom or never necessary to take away any portion of the skin, provided it be healthy. A single straight incision through the covering integument will, should no very severe inflammatory changes have ensued, generally enable the operator satisfactorily to expose the tumour, and subsequently to free it from its connexions with adjacent parts by using the handle of the scalpel rather than its blade.

Not only should the line of incision, especially if the operation be called for in a region exposed to observation, such as the neck, be chosen with due regard to the prevention of future deformity, but the lips of the wound should be joined in such a way as to render the surgeon's handiwork difficult of detection.

When the glands involved in disease are more superficially situated, less surgical skill is required; for there is not so much danger of wounding large arterial and venous tracts and important nerves. The same tact is, however, necessary in endeavouring to obtain a cure with the least possible subsequent disfigurement.

I have frequently met with the most satisfactory results in removing tuberculous glands situated near the surface of the neck; but then I have been careful to select only those cases which appeared favourable for operation.

I cannot close these observations relating to the removal of enlarged and diseased glands situated in the neck, without again enforcing the necessity of a most careful inquiry into the local and general symptoms exhibited in every case which may be submitted to operation; for unless this be done there is every probability of failure, and the occurrence of similar disease in glands which were previously healthy.

A case illustrating these remarks is recorded in the *Medical Times and Gazette* for February 1859. A girl, about sixteen years of age, had removed, by Mr. Hilton, of Guy's Hospital, upwards of twenty glands from the left side of the neck. "The case did well; but, after the girl had left the hospital, other glands in the same side of the neck enlarged, and we saw her in another hospital about a year afterwards with a swelling nearly as large as her original one."

Although it is most commonly in diseased conditions of the cervical glands that direct surgical interference is called for, still it is sometimes expedient to take away the glands situated in the arm-pit and other parts. Only those surgeons who have undertaken the removal of the axillary glands can be fully aware of the difficulty experienced on account of the near proximity of highly important blood-vessels and nerves; with care, however, the operation may be safely accomplished. I have already quoted an instance in which I assisted to clear the axilla of tuberculous glands; and Mr. Hillman, of the Westminster Hospital, records a case in which he successfully took away all the glands of the arm-pit in a boy four years of age.

[*To be continued.*]

Transactions of Branches.

SHROPSHIRE SCIENTIFIC BRANCH.

DIPHTHERIA.

By W. NEWMAN, M.D., Fulbeck, near Grantham.

[Read Jan. 25th, 1861.]

THERE seems not much doubt that diphtheria was first observed in the fen districts of Lincolnshire; some time, however, occurred before it reached this immediate neighbourhood, and, for some months after their first appearance, the cases that fell under my own notice were so mild in character that I could hardly believe them to be true diphtheria, from the absence of severe symptoms and the less duration of the whole attack.

I had soon afterwards full reason to know the true disease; and since Midsummer 1858 I have had almost a succession of cases varying in character.

In filling up a report for the committee of the Epidemiological Society, in the early part of 1859, I stated that there appeared reason to speak of two distinct forms of the disease. The *one* occurred in persons of all ages; it was marked by exudation-points, with comparatively slight redness of throat and fauces; these points of exudation not spreading, and the whole clearing off in two or three days. The *other* was marked by deep redness of fauces, thicker and more extensive exudation, first appearing in separate patches, but rapidly coalescing into one large mass; the symptoms were much more severe; and convalescence was tedious.

Further experience inclines me to the belief that these are simply allied forms of the same affection. The one will merge into the other insensibly; one member of a family shall have the severe form; two or three others only the slighter condition.

There cannot be doubt as to existence of direct contagion from one to another. More than once it has been imported into a row of houses by some relative coming from a distance; thence travelling to those families in direct intercourse with the house just affected; and so on through the village. I took the disease myself, in August of the last year, from a girl to whose throat I had applied the usual escharotic. That cases do happen without history of infection is certain, and these are most probably due to transmission of the fomites somehow or other by the atmosphere; as seen, *e.g.*, in the ordinary exanthemata. I do not know that there is anything to add to the disease as described in systematic treatises. Some minor points may, however, be touched on. There is, I think, in almost every case I have seen, a peculiar change in the voice even before the exudation or swelling of the tonsil declares itself: the sounds are husky and unnatural. There is, coincident with the first appearance of redness on the fauces, a sort of yellowish mottling usually over the central portion; and when this is to be seen, after the lapse of a very short time there is the characteristic exudation. More than once I have been led to believe the affection would result in pure diphtheria, when other symptoms and the prior history of the patient would rather lead to the opinion of acute tonsillitis. There are early and extreme prostration, and not merely the muscular pain of catarrh in the limbs, but often severe gnawing pains.

I have examined the fibrinous deposit repeatedly, but never discovered any cryptogamic growth therein.

Scarlatina has been said to be allied to diphtheria, and the two to be mutually prophylactic of the other.