scratches or sores of mucous membrane and skin which may be produced through the violence of movement.

Of drugs for this graver type of case, the most serviceable seems to me a combination of bromides and chloral. In the present case, bromides were at first used every three hours with insufficient effect. It was only when chloral was added that a sufficient restraining action on the movements was effected. The bromides were given in doses of 30 grains every three hours or thereby. Chloral was then added, first to the extent of 20 grains, which had little effect, and then twelve hours later in 30 grain dose. Fortunately this succeeded in giving the patient four hours' sleep. On the following night a similar dose afforded seven hours' sleep. During the deep sleep the muscular phenomena disappeared almost completely. On awaking from sleep, the patient presented some of the old violence of movement, but he seemed extremely tired. After the second night's sleep, he remained profoundly exhausted, and this has continued. The pulse remains rapid and the temperature elevated (100° F.). This is of grave omen, all the graver that now he has begun to show disinclination for food. When I saw him, a few minutes before coming to lecture, it was hopeless to think of bringing him to the clinical theatre. I must content myself by inviting you to pay a quiet visit to his bedside. The outlook is most dubious. Fatal collapse seems imminently threatened.

POSTSCRIPT.

[For two days the patient continued to get progressively weaker. Feeding became extremely difficult. At the end of forty-eight hours the temperature fell abruptly to 97° F. The pulse got very rapid (about 144) and almost indeterminate. Six hours later the collapse ended fatally. Unfortunately the patient's father resolutely refused a post-mortem examination.

The day after the lecture was delivered there appeared in the *Lancet* (January 18th, 1908) a Note on Certain Pupillary Signs in Chorea by Dr. F. Langmead. After dwelling on the paucity of observations regarding the pupil in chorea, he reports that he has sometimes observed the occurrence of hippus in children more than slightly affected by the sthenic type of chorea. I have pleasure in citing this, because so far as a further glance through the literature reveals, it is, apart from the observations recorded in the lecture, the only reference to the phenomenon as occurring in chorea.]

A Clinical Lecture

ON

CHRONIC BRONCHITIS.

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THE treatment of cough, and more particularly of what is termed "winter cough," constitutes a large share of out-patient and of general practice at this season of the year. Now, a condition which is so common year by year, whose features are so familiar, is apt to lose in scientific interest, or to be set aside in the more fascinating pursuit of the newer methods of treating conditions supposed to be more interesting or more important. The words of Hooker, written in the earlier part of last century, apparently remain true:

The science of medicine in all its departments is in a very changeable state. The discoveries which are made from time to time in anatomy, physiology, and pathology, the theories which are put forth, and the new remedies and modes of treatment which are continually proposed, keep up a constant excitement in the profession.

A disease, therefore, which is not invested with the prevailing scientific halo is apt to be neglected. But no disorder, however commonplace, should be divorced from a continuous association with scientific thought. And

when old facts and old views are considered in this light, the commonest conditions acquire interest, and our hitherto defective view of them gathers clearness and definition.

THE DIAGNOSIS OF A BRONCHIAL COUGH.

We are perhaps too frequently apt to conclude that a cough betokens some chest trouble, and unless care be taken, great and sometimes ridiculous mistakes may be made. The diagnosis must always be carefully and systematically carried out. To the practised ear, it is true, a cough will often betray its seat or its causes from its characters, such as tone, intensity, etc. But in all cases the physical examination should be complete. First, the entire mucous tract from the nares to the bronchi should be inspected, as the cough may arise from any point in this path. The external auditory canals should also be examined in view of the possibility of ear cough. In children, teething requires only to be mentioned. Any area of hyperaesthesia, any congestion, hypertrophy, ulceration, granulation or growth occurring at any point in the upper respiratory tract may be the cause of cough. It is unnecessary to enumerate the various lesions which are specially apt to be overlooked. I have known, for instance, a cough which had baffled several physicians quickly disappear after cauterization of hypertrophied adenoid tissue at the root of the tongue. Cough having its seat in the upper respiratory passages is usually of the hard and dry character.

When in the course of this examination the larynx is under survey the trachea should always be inspected, as the information gained is often very valuable. In some patients the trachea, or at any rate its anterior surface, can be seen right to the bifurcation in the usual sitting positions, but in some cases Killian's positions are necessary. By practice one can usually make out the bifurcation or see into the right bronchus, and note is made of the degree of hyperaemia or anaemia, venous congestion, patchy coloration, mucous deposit, and any other irregularities. But these phenomena are so intricate in their relationships that their discussion would demand a separate lecture.

The examination of the chest is next carried out, but it must be remembered that conditions provocative of cough may be present simultaneously in both upper and lower respiratory tracts. In this examination, all possibility of cough arising from diseases of the lungs or pleurae, from pericarditis, aneurysm, tumour or enlarged bronchial glands must be considered. Should the physical signs in the chest be meagre or absent, we must not neglect to consider the possibilities of nervous or reflex cough. You remember the instance given by Graves of a patient whose cough had long baffled the faculty, but which was promptly cured by an old woman who administered something which caused the expulsion of a tapeworm. The stomach and the pregnant uterus are frequent sources of reflex cough of remoter origin. It is necessary, however, to note that the class of nervous coughs may be accompanied sooner or later by congestive conditions in the larynx and trachea due solely to the mechanical irritation. This is commonly found in children, in whom such coughs are frequent. Lastly, there is the purely hysterical cough, which is generally apparent from its loud ringing or barking character, though in some instances it is merely a "teasing hem." I have known iodide of potassium and ipecacuanha given for such a cough in the expectation that it might thereby be "loosened."

If, on the other hand, our examination proves the presence of a cough due to a bronchial catarrh or bronchitis of the chronic variety, we proceed to consider the scientific conceptions on which the treatment is to be based.

THE NATURE OF CHRONIC BRONCHITIS.

It is generally assumed that catarrhal conditions of the bronchial mucous membrane are caused by irritants of various kinds which affect the mucosa as a whole, and this view is doubtless to a certain extent correct. But morbid anatomy, clinical facts and the results of treatment lead us to recognize that a more definite idea of the nature of bronchitis must be entertained if confusion is to be avoided. The indications, however, become clear when we consider the particular elements or structures in the

membrane which the *materies morbi* specially elects to attack.

In this connexion permit me, in the first place, to offer a few observations respecting the mucous glands of the bronchi. In man and in all the higher animals these glands exist in abundance. Notwithstanding this, it is a curious circumstance that we have no knowledge of the fate of their secretion. In the normal condition there is never any expectoration of mucus. It is generally believed that the mucous secretion merely serves as a surface lubricant, but I venture to submit that this view is open to question. In the first place, it may be asked, if the mucin secreted is merely required as a surface lubricant (an office which the lining epithelium, with its goblet cells, seems perfectly adequate to fulfil), why are the glands not only abundant, but why does the mucin they secrete differ in certain respects from the mucin secreted by the mucous glands in other situations? We do not know a great deal about mucin, but the researches of F. Müller and Hammarsten have supplied some valuable data. According to these investigators, the bronchial mucin contains 35 per cent. of a reducing substance obtainable both from the carbohydrate and the proteid constituents of the mucin molecule. This reducing substance is a glucosamine or non-fermentable sugar. On the other hand, the mucinoid substance secreted, for instance, by the glands of the bile ducts is a nucleo-proteid and not a mucin at all, and therefore contains no reducing substance. Again, the salivary mucin is a true mucin, but it differs in certain respects from the bronchial mucin. For example, the bronchial mucin is insoluble in dilute hydrochloric acid, while the mucin of the salivary glands is soluble. The bronchial mucin becomes flaky with acetic acid, while the salivary mucin is precipitated into tough fibrous masses. The mucin derived from other situations shows similar discrepancies. Now, if the bronchial mucin has this rather elaborate structure, is its whole function that of a lubricant? If the salivary mucin is at least intended to be swallowed with the food in order to subserve some purpose of digestion, are we justified in ascribing to the bronchial mucin a function so subsidiary in comparison?

Again, according to a number of observations in man and animals which I carried out at one time, it was found that these glands were relatively more abundant in the young, and seemed gradually to decrease as age advanced. This would seem to imply that they are specifically related to the growth and development of the lungs.

It appears, therefore, not unreasonable to consider that the mucous glands possess vital functions, not yet apprehended, by which they maintain or promote a healthy metabolism in the parts in which they are situated. It is easy to suggest that they may possess an internal secretion, or that they may separate and destroy effete products. That their secretion possesses a substance powerful enough to reduce Fehling's solution seems, at any rate, to favour the latter supposition.

The most important tissue in any organ being the secretory tissue, it is above all necessary to consider in inflammatory conditions to what extent and in what manner this tissue is affected. Now uncomplicated chronic bronchitis is chiefly an expression of abnormal activity in the epithelial or mucous tissues of the membrane. The epithelial lining of the affected tubes remains, as a rule, not only perfectly intact, but in a state of abnormal luxuriance and formative activity. The same applies to the mucous glands, which frequently partake of hyperplastic changes. From these sources altered mucus and young epithelial cells are produced, and the latter, instead of maturing, are cast off as mucous corpuscles. Outside the mucous tissues the only further change in the membrane is found in the blood vessels and lymphatics; the remaining structures—the muscle, elastic tissue, cartilage, etc.—are passive, and show no structural alterations, at least not until a very late stage of the disease, and then always in association with certain interstitial lesions of the lung itself. There are, however, the vascular changes. The capillaries are much dilated, but ordinarily there is no great diapedesis of leucocytes. In normal circumstances there is a quick-flowing, quick-ebbing tide of blood in the membrane, owing to the alternate expansion and relaxation of the tubes in the respiratory acts. In bronchitis the tubes are swollen and more or less rigid, causing tidal embarrassment and engorgement of the vessels. Hence the exudation of serum and disturbances

in the local lymph circulation. The expectoration, therefore, consists of mucus, serum, mucous corpuscles, degenerate epithelium, and few or more leucocytes. It is frothy and sticky, and often exhibits colour changes, blue or green, which are due to the action of bacteria after the secretion has lain in the tubes. When freshly secreted, the mucus resembles normal mucus, but it is a vitiated or toxin-bearing mucus, and its quantity is under ordinary circumstances regulated by the amount of toxin present and the area of tubes involved.

Chronic bronchitis is therefore an affection in which, apart from the blood vessels, the epithelial tissues are chiefly engaged. We note that it occurs frequently at the extremes of life. It is found in the child, because the mucous glands are in their highest degree of functional activity; and in the aged, because they are in a state of decay. In either case they are more easily the prey of morbid agencies. In the child a mucous bronchitis is found; but in the old we often find much thin mucoserous discharge, due to degeneration in both glands and vessels—a bronchorrhoea. The special implication of the mucous glands in chronic bronchitis was not missed by the older physicians, some of whom referred to bronchitis as “follicular” disease, meaning thereby disease of the mucous glands or follicles. Ordinarily, we find chronic bronchitis confined to the larger and middle-sized tubes, and associated with more or less emphysema, more or less asthma, and attended by considerable expectoration. We also encounter a “dry” form of the affection, the *catarrh sec* of Laënnec. Some have supposed this “dry” form to be gouty in nature, but Garrod and other eminent authorities have disputed this. We find both dry and moist varieties in gouty subjects. The variety, however, which is persistently dry, is always circumscribed to certain tracts of lung, and the smaller bronchial tubes are chiefly involved; hence the paucity and viscidly of the sputum. Otherwise, we find all gradations of moistness and dryness occurring at different times in the same subject, and there seems to be no essential difference between them.

Next to the epithelial tissues on which the brunt of the disease falls, we have to consider the functional disturbance which is produced in the bronchial muscles, and this is a very important point. It is caused by the irritation of the toxins and by the mechanical conditions present. Spasm and relaxation are thereby produced. Either the toxins acting on the nerve endings, or the interference with the normal rhythmical movements caused by the swelling and tension, may goad the muscle on to a condition of spasm. To this succeeds a degree of exhaustion, and so a vicious circle is maintained. In very advanced case the relaxation is permanent, and may amount almost to a condition of paralysis.

TREATMENT.

The treatment of chronic bronchitis is of course many-sided, and the complications may be numerous, but for the present we may confine ourselves to the consideration of the medicinal treatment which the circumstances of its pathology suggest. Now we have all of us been accustomed to think of expectorants in connexion with the cure of bronchitis. What is implied by an expectorant? It is, of course, supposed to be a substance which induces or assists expectoration. But when we come to reflect in what way this assistance is given we may find ourselves in difficulty. Take, for instance, senega. We are advised that when the secretion is profuse, and the expulsive power feeble from weakness of the bronchial muscles, this drug is to be given. How does it act? We should expect it either to stimulate these muscles directly or else to stimulate the respiratory centre. But we have no knowledge that senega acts in either of these ways. Dr. George B. Wood says that its action is that of an alterative, and W. E. Dixon, who studies the actions of drugs from the laboratory standpoint, declares that it is not absorbed into the system at all. Squill, again, is recommended for the same purpose as senega—that is, to assist in the expulsion of the secretion after febrile symptoms have subsided. Now, what we really know about squill is that it is a powerful cardiac stimulant. Ringer asserted that it acted on the heart like digitalis, and experiments confirm this. Speaking of its action in bronchitis, Wood says that it “excites the local capillary circulation and the epithelium.” Christison, on the other hand, said that squill should be given in acute bronchitis, as it never

stimulated the circulation. Many other examples might be quoted showing our ignorance of the action of the alleged expectorants on the bronchial tubes, though probably few would assent to the opinion of Dixon that any action they possessed was merely reflex, due to the excitement of the stomach.

In view of the morbid alteration in the epithelial and glandular tissues, which is such an essential feature of the disease, we turn to the search for an agent or agents having a specific action on these structures. A good many drugs act on the mucous tissues, but in the case of chronic bronchitis we may limit our consideration of them to two or three. The first is iodine, in the form of potassium iodide. Although recommended by Sir Charles Scudamore in 1847, its great efficacy in cases of chronic bronchitis, both as expectorant and alterative, has only in recent times been fully recognized. The next to be mentioned is the balsam of Peru. The volatile oils—benzyl benzoate and benzyl cinnamate—and organic acids contained in this powerful substance exert a direct, peculiar, and specific effect on the mucous cells of the bronchi. The last I may mention in this connexion is oil of turpentine. But after trying the various oleo-resins, tar, ichthyol, sulphur, and many other drugs, I have found the balsam of Peru the most efficacious and the most generally applicable. It acts quickly, altering and diminishing the mucous expectoration. Patients will return in the course of a few days saying that the expectoration has changed from yellow to white, and the cure is often very rapid. Nor is its efficacy, as is generally supposed, chiefly confined to cases with excessive secretion. On the other hand, certain cases of more or less dry bronchitis will rapidly yield to this substance even after potassium iodide has failed. As regards the oil of turpentine it is extremely efficacious in advanced cases—especially, though not necessarily, where there is abundant secretion; but it is not easy to lay down definite rules for the administration of either of these substances. When the expectoration is already free, we begin at once with the balsam in doses of 10 to 20 minims, given disguised in emulsion with malt, ammoniac or mist, amygdalae, oil of anise and syrup. Very shortly a decided improvement will in most cases have set in and no further treatment may be necessary. If, on the other hand, the expectoration be scanty and difficult to expel, we begin with potassium iodide (gr. v-vij), and having obtained a free expectoration, follow up with the balsam. The addition of ammonium chloride or carbonate and sodium bicarbonate assists the action of the iodide. The salts may be disguised by extr. glycyrrhizae liq. Under certain circumstances the iodide may be added to the balsam, but this is not often called for.

Now, it is to be remembered that these drugs act chiefly on the mucous tissues or on the vessels, and do not directly allay irritation. If, therefore, their remedial action be not in all cases soon apparent, it must not be concluded, as many are apt to do, that they have failed. They will not readily fail providing we bring about the suitable local conditions. There may, for instance, be an excessive degree of irritation in the nerves, the cough continues very bad, and the mucous membrane cannot obtain that degree of rest which is required in order that our curative remedies may act. It is needless to enlarge on the importance of rest as an essential to healing action, and the bronchi form no exception to the rule. First, then, get the membrane rested, and there are several ways of bringing this about. We may use soothing inhalations such as Scudamore's compound inhalation of ipecacuanha, conium, and hydrocyanic acid. Morell Mackenzie recommended some very good inhalations, and mention may be made of carbolic acid when the membrane is dry and oil of turpentine when there is mucous deposit on the trachea. The vapour of tar and belladonna is often very efficacious. Medicated pastilles should not be omitted, for there appears to be a special connexion between the area just where the respiratory tract joins the oesophagus and the cough centre. At any rate, it is often remarkable how anodyne preparations applied to this part will allay even a bronchial cough. But in many cases the sedative will require to be taken internally, and of these there are many from which to choose: the bromides, hyoscyamus, conium, etc., and of course opium and its preparations. The more recently-introduced hydrochloride of acetomorphine is very efficacious and not attended with unpleasant by-effects.

There is also another and important source of irritation which may first require to be combated, and that is excessive action on the part of the bronchial muscles, due to causes which have already been mentioned. The class of sedatives employed for the cough usually relieves the asthmatic attacks, especially if the iodide be given as well. But in other cases there is sufficient expectoration and our remedies act well enough so far as that is concerned, but the irritation is caused by the retention of secretion owing to weakness and disorganization of the bronchial muscles. In these cases strychnine, digitalis, and ferruginous preparations will give assistance. Strychnine stimulates the respiratory centre and digitalis directly stimulates the bronchial muscles. On the other hand, if the secretion is excessive and becomes threatening, we should check it by opium and give a cathartic. The idea that opium is dangerous in such circumstances has been over-rated. There is a mean to be found where its influence is decidedly beneficial.

In most ordinary cases of the disease the plan of treatment herein sketched out, coupled with the free use of rubefacient applications and massage over blocked areas, so as to induce the lung reflex of dilatation, will generally be found satisfactory. The presence of emphysema does not thwart our attempts unless it be excessive, for emphysema of itself does not usually induce bronchitis. This may be seen in the case of those suffering from the congenital form of the disease, who, though dyspnoeic, may be but little troubled with cough and expectoration. The condition of the circulation and the renal functions must be carefully supervised, and when the back of the disease has been broken, so to speak, tonics are useful. Griffith's mixture, which contains iron and myrrh, is a good one, but unsightly. The combination was really first recommended by Dr. Badham, who in 1808 discovered the true nature of bronchitis. He prescribed an electuary of ferr. carb. one part, myrrh four parts, and syr. zingib. three parts. Dose, a teaspoonful. Large doses of sarsaparilla with nitric acid are recommended by Graves in cachectic states. Then the diet is of great importance. Some patients require the carbohydrates cut down very much, and others the proteids. Bronchitics are also very prone to indulgence in alcohol, but their instincts, in this respect are erroneous, as it undoubtedly feeds the flames of the disease, and is one of the chief causes of its persistence and recurrence.

BLINDNESS IN PORTUGAL.—A long report by Dr. Meyer on blindness in Portugal, its causes, and the extent of its prevalence, was presented to the Lisbon Medical Society on January 13th. It is based, for the most part, on records obtained in the years 1904 and 1905 (than which, apparently, there are no later available), and some of the conclusions arrived at were communicated at the meeting of the Medical Congress in 1906. Dr. Meyer's data own various origins—the general census, certain inquiries undertaken by himself, and others by Dr. Branco Rodriguez, and from these he constructs tables showing the number of blind persons to every 10,000 of the population in the various districts of the kingdom and in various years. These are rather remarkable as exhibiting very great differences. Thus, for example, in 1878 Braganza stood at the head of the list with 25.4, while in the island of Madeira the proportion was only 5.5 per 10,000. Madeira has apparently always had this low percentage of blind persons if we may judge from these statistics, though in 1904 the figures had risen to 7.6, about equal to those of Lisbon, which is the next most favoured district in this respect. The total proportion for the whole of Portugal, which in 1878 was 20.0, had sunk in 1904 to 12.5, a considerable gain, though the ratio is still high compared with other European countries. Although Bulgaria has the enormous proportion of 31.5 and Russia the very large one of 19.6, the only other country showing double figures is Finland, with 11.9. England has 8.6, France 8.8, and Norway 8.7; Italy, Switzerland, and Germany are rather better with 7.5, 7.2, and 7.1; and the best averages of all are shown by Holland with 4.7, and Denmark with 4.4. The three main causes of blindness in Portugal, whether in the case of one or both eyes, are injury, ophthalmia neonatorum or congenital blindness (these two not being statistically separable), and small-pox. Of 2,041 persons blind of both eyes, the numbers due to these causes were respectively 467, 567, and 439; and of 3,786 persons who had lost the sight of one eye only, injury accounted for it in no less than 2,485 cases, small-pox in 736, and "congenital" in 203.