the nutrition, circulation, or function of the lungs or other organ to which the microbe gains access. The purely local conditions may be thus suggested for discussion:—

(1) Pulmonary catarrh—not bronchitis affecting the tubes lined with ciliated epithelium, but the form of “pneumonia” which affects the intralobular passages and ultimately the air sacs; not lobar and fibrinous, but lobular and catarrhal inflammation. How far is this condition a necessary antecedent? Does phthisis ever follow hepatitis, or bronchitis, or emphysema? What relation is there between pleurisy and phthisis? Does phthisis ever begin without preliminary catarrh—that is, do the bacilli themselves, mechanically or by their chemical products, act as irritants on a healthy lung and produce the soil suitable to their future growth? Is the pulmonary catarrh which follows measles more apt to end in phthisis than any other? or that which is often a sequela of whooping-cough? Again, are the various forms of pneumoconiosis—potters’, miners’, grinders’, ironworkers’ phthisis—all of them tuberculous? If so, must we assume that when pulmonary catarrh is severe and protracted it always becomes the seat of tuberculous affection—in other words, is the bacillus of tubercle practically ubiquitous in cities and workshops? Does the influence of cold damp dwellings and undrained soil—which the late Dr. Bowditch in New England and Dr. Buchanan in our own country have demonstrated—depend on the frequency of pulmonary catarrh to which these conditions give rise?

What shall we say of cases of phthisis following traumatic or idiopathic hæmorrhage? Does a healthy lung ever bleed? and does pulmonary hæmorrhage lead to catarrhal pneumonia, tuberculous infection, and caseous degeneration and ulceration? or is hæmoptysis only the first symptom, and never the first event, in a case of pulmonary phthisis? If hæmoptysis is a cause of phthisis, why does not tuberculous disease supervene on hæmorrhage from the lungs of cardiac origin? Does a wound of the lungs or injury to the chest lead to phthisis, whether by causing hæmorrhage or inflammation? Was this the explanation of the classical instance recorded by Herodotus (lib. vii, cap. 88), or was the fall and the subsequent phthisis a mere coincidence? Do the bacilli act as mechanical irritants or do they poison the tissues with their excreta? in either case, do they set up pulmonary catarrh or do they find it?

Of general predisposition, can we justly regard either anæmia, starvation, drink, or bad ventilation, syphilis, or diabetes, as causes of phthisis; or may we explain their action as either favouring lung catarrh, or providing ready access of abundant bacilli to catarrhal lungs?

How shall we meet the undoubted fact of hereditary consumption? Is it not more frequent than the chance incidence of a very common malady will explain? How many cases may be due to direct contagion, as from mother to child, or from one child to another? How many can be fairly attributed to common habitation, trade, food, or habits? In strictly hereditary cases, is it special susceptibility to the poisonous products of bacilli, or tendency to pulmonary catarrh, or vulnerability of the tissues generally which is transmitted?

What is the true relation of pregnancy and childbearing to consumption? Is phthisis ever congenital; and, if not, at what age may it first appear? Again, are we to look on the very important symptoms of derangement of the digestive organs—the not infrequent initial vomiting, the early dyspepsia, anæmia and wasting, which often precede the cough and physical signs of pulmonary disease—as due, like the pyrexia of phthisis, to the effects of bacillary infection, or are they in any cases to be regarded as predisposing causes?

To pass rapidly on to another group of concurrent conditions of phthisis, is the traditional phthisinoid chest the precursor of future or the effect of present disease of the lungs? The same question applies to the *ungues adunci*, and to the general build or *habitus* of the body which has been supposed to denote the tuberculous predisposition or diathesis. Does curvature of the spine or rickets lead to phthisis? Does caries of the bones or tuberculous disease of the joints or lymph glands, or lupus, or leprosy, and if so, how and under what conditions? What are the facts as to liability of the two sexes and of different ages? and do they throw any light on the etiology of

phthisis? What are the facts of geographical distribution, and how do they affect the theories of contagion, of pulmonary inflammation, and of general vulnerability? What animals are most liable to tuberculous disease of the lungs, and to what causes may we ascribe the almost complete freedom of some and the equally marked proclivity of others?

Lastly, we may inquire whether there are any natural prophylactics of phthisis: ventilation, cold, heat, particular kinds of food, or special diseases, such as gout, cancer, and valvular disease of the heart?

In leaving the discussion of this subject to the Section, I will venture to recommend that we may best help each other and the Association by keeping strictly to the etiological aspects of pulmonary phthisis, excluding the important considerations of pathology, prophylaxis, and treatment, which will arise from the conclusions at which we may arrive; and that the subject which has been assigned for discussion may be regarded from the threefold aspect I have indicated: the invasion of the bacillus and its action on the tissues, the predisposing causes in the lung itself, and the predisposing causes in the organism.

[The continuation of the Discussion will be found at page 846.]

THE USE OF DRUGS IN THE TREATMENT OF EARLY PHTHISIS.

Read in the Section of Medicine at the Annual Meeting of the British Medical Association held in Bournemouth, July, 1891.

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THE discovery of the tubercle bacillus, and the way in which it appears to be associated with the progress of the more serious forms of tuberculous disease, has tended to cast drug treatment rather into the background. The ancient treatment of phthisis pulmonalis by demulcent drinks, such as infusion of comfrey or of mullein, and by such remedies as paregoric tincture and oxymel of squills we now regard with feelings allied to pity, and think we have made some progress in drug healing. We look with more respect on the tar water treatment of consumption highly commended in 1744, and Sir A. Crichton's treatment of the disease by continuous inhalation of the vapour of boiling tar mixed with carbonate of potash to neutralise the acetic acid is a method often advantageously pursued in the present day.

In hospital practice, especially among out-patients, one is compelled to do the utmost one can with drugs. The patients are poor, often hard worked, and they cannot obtain the advantages in the way of change of air and rest that fall to the lot of the more affluent classes. In the poorer classes phthisis is often brought about by some neglected inflammatory mischief in the first instance, such as bronchitis, pleuritis, and sometimes pneumonia. In such cases drug treatment has a good chance to distinguish itself, and it is to cases of this kind that I would specially draw attention, as from such my experience has been largely drawn.

A brief reference to two patients in Victoria Park Hospital some years ago will guide as to the line I wish to take, and will be suggestive to any who may make remarks on this paper. One day I found two new cases in the four-bedded ward, both young men. One came from Bethnal Green with a history of long winter cough and bronchitis, signs of consolidation at one apex. The other, a youth, who carried his story in his face—cough, with progressive emaciation coming on gradually from no known cause, slight hæmoptysis, high temperature, and rapid breaking down in the upper part of one lung, came from a high and dry part of Oxfordshire, a district that I well know. I remarked to my assistants that the first case would leave the hospital and return to Bethnal Green much relieved. The case of the other patient would not be reached by drugs but would go from bad to worse; and so it proved, for he died in the hospital.

Let me place before you another case in which from the first I felt sure medicine would prove useless. A young lady, aged 17, living in Scotland with every comfort around her,

was much cast down by the rather sudden death of her mother. Gradually cough came on. The temperature rose from 101° to 105° ; pulse 130. The urine contained excess of urea, but no albumen. I saw this girl in January, 1886, in a most healthy house in a high dry part of Yorkshire, and found the symptoms as above given. There was no marked dullness, but the left chest was full of crackling *râles* and the right lung had uneven bronchial breathing, evidently soon going to follow the left. Catamenia suppressed. Five grains of sulphate of quinine served to reduce the temperature for a time. Nothing, in my opinion, could have been more unpromising, and I could only endorse the opinion already given by physicians from London and Leeds that the case was one where we could not have much hope. Privately I remarked to the doctor in attendance that he would not find any drug that would have the least effect in controlling such a case as that before us. We of course did our best to encourage the patient and her friends, and prescribed iodoform pills; but in March the young lady died. Both lungs were full of *râles*, there was slight hæmoptysis, and diarrhoea was very troublesome. The case was not to be reached by drugs in our present state of knowledge.

Bacilli were abundant in another very similar case.

I have no more to say about the drug treatment of acute tuberculosis, and willingly quit the subject.

It is in cases of catarrh at the lung apex due to cold caught or to respiration for some time of close vitiated air that drug treatment appears to advantage. That peculiar catarrhal state of the apex which has been described as pulmonary cachexia, and which is close on the borders of tubercle, and is due to a degenerated condition of the epithelium from constant respiration of bad air, improves rapidly when the patient is removed to a pure air, such as that of Bournemouth. Where, however, we cannot give the patient the advantage of removal we have to do our best with drugs. Specially I would draw attention to the good results that may be obtained in such cases from the use of the hypophosphites. From what I saw of the effect of phosphorated oil given in cases of phthisis by the late Dr. Cotton at Brompton Hospital, I was induced to try the hypophosphite salts. The oil of phosphorus given in small dose in capsules is very apt to cause nausea, but this objection does not apply to the hypophosphites, and at the same time these salts contain phosphorus in such an active condition that they burn readily when heated in a capsule over a flame.

The result of some twenty-five years' experience in the use of the hypophosphite salts has led me to the following conclusions based on records of cases. Hospital out-patients who came with cough and expectoration, perhaps blood-stained at times, and who presented *râles* at the lung apex, continuing there after some amount of bronchitis due to cold had been overcome by various remedies, improved in a way that surprised me on giving them 5 grains of hypophosphite of soda three times a day. Plain water or infusion of calumba were the vehicles usually employed in giving the remedy. The patients got better, and some would return in perhaps six months' time with the same symptoms and signs again, and would again improve on the hypophosphite treatment. In cases of persistent consolidation of lung after pneumonia I have in very many cases seen absorption of effused products proceed speedily under treatment with hypophosphite of soda; this, too, in cases where ordinary treatment had been followed to no purpose for some time. Cases of this description that appeared doomed to a speedy death by phthisis I have seen clear up and recover perfectly on 5 grains of sodium hypophosphite given three times daily for five or six weeks. In cases of pleurisy with effusion the hypophosphite salts seem to me to have no effect whatever. In cases where the pleura appeared to have been roughened by deposit so that friction sounds of loud and coarse character were very audible I have seen all these sounds vanish and the patient do well under the hypophosphite of soda.

Before the days of the tubercle bacillus I had learnt that there were cases of phthisis attended with fever and rapid progress in which the hypophosphite failed in a way that I could not understand. I believe from more recent observation that these were cases where the tubercle bacillus was too strong to be overcome by a medicine whose action lay mainly in promoting the absorption of inflammatory products.

Many years ago Dr. Graves, of Dublin, as well as Dr. Rush, of Philadelphia, and Dr. Munk, of London, laid stress on the use of mercury as an absorbent in cases of phthisis. Mercury, says Graves, is of use where the affection of the lung is local and the system generally not affected. In scrofulous pneumonia, rather than in tuberculous disease, the mercury is said to act with most advantage. How far this is true I will not now stay to inquire, but the idea in giving mercury was to get rid of inflammatory deposit and so prevent phthisis. We now say, Get rid of inflammatory deposit and so take away what may prove a nest for the growth of tubercle bacilli.

Whether it be phosphorus or a hypophosphite that is given, I believe a process of fatty change and liquefaction of the effused product is set up and absorption follows. Sometimes the process seems to me for a time attended with some amount of increase in temperature, and when this is the case it is well to reduce the dose of the drug or give it at longer intervals. In recurring hæmoptysis, too, the hypophosphite must be used with care. The most active in liquefactive power is the hypophosphite of potash, and I remember a practitioner telling me he had given, as he said, the hypophosphite of soda, and it caused such rapid breaking down of the lung that he determined to have nothing more to do with hypophosphites in phthisis. It turned out to be the hypophosphite of potash that he had been giving. The lime hypophosphite acts often remarkably well in cases where secretion is profuse. The daughter of a medical man was cured of bad diarrhoea by hypophosph. calcis. The lime salt checks profuse sweating and also diarrhoea. The dose should not exceed 5 grains, and it answers best when given with 5 to 10 drops of the saccharated solution of lime, glycerine, and sometimes syrup of tolu.

Very rarely indeed have I found when the hypophosphite fails to remove an apex catarrh or inflammatory deposit that I have gained by changing to such medicines as tartarated antimony in very small dose, iodide of potassium, or some form of mercury. Once or twice a change of treatment has been eminently unsatisfactory; in one case clearly disastrous.

Passing over such drugs as the mineral acids, creasote and guaiacol, which are often useful as tonics in some cases, I must say a word on the use of the inhaling respirator. This mode of treatment first came to my notice more than ten years ago. A patient, who had been at Ventnor Hospital, showed me the simple form of inhaling respirator used by Dr. Sinclair Coghill at that hospital. This method of treatment has now been greatly extended, and I believe it to be trustworthy and efficient. Most here present know the form of respirator now in use, and the use of the respirator with iodoform and eucalyptus oil, as devised by my colleague, Dr. Vincent Harris, has proved most useful in the treatment of early phthisis.

The patient should, after clearing his lungs as much as possible in the morning by cough, wear the perforated zinc respirator invented by Dr. Burney Yeo, and keep it on for an hour; again in the middle of the day, and a short time at night. Nothing appears to me so useful as iodoform with ether, alcohol, or eucalyptus oil. This is soothing and excites no cough. Next to this comes the best German creasote, with or without ethylic alcohol. Thymol, carbolic acid, and iodine are all inferior to the above.

Next to these inhalations—I would not say inferior to them—I place persistent, and even severe, counter-irritation as a means of treatment too much forgotten. We have seen a remarkable arrest of phthisis of an active kind in a young woman in the Victoria Park Hospital from croton liniment used eight years ago. The linimentum terebinthinæ aceticum of St. John Long is still deserving of a high place, especially in chronic disease of the lung base.

I would like to have said a word on the use of drugs in early and late hæmoptysis, and on the great value of occasional emetics, but I think I have said enough for the present.

ERRATUM.—Through an oversight of Dr. Godson's in correcting the proof, the mortality in Dr. Murdoch Cameron's Cæsarean operations, 1 fatal case in 10, is put down as 1 per cent. instead of 10, the 0 having been inadvertently omitted.