THE CAVENDISH LECTURE ON A SPEEDY AND SOMETIMES SUCCESSFUL METHOD OF TREATING HAY- FEVER.

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It has been sometimes said by way of reproach that the scientific workers in medicine, although eager in the pursuit of knowledge for its own sake, were careless of its practical applications to the treatment of disease. If at any time this reproach was a just one I do not know, but beyond all manner of doubt it would not be a just one now, for in almost all countries, and in nearly every school of every country, you can see not only the earnest pursuit of knowledge, but the most zealous efforts to force it into fruit for the uses of men; and in the study of no subject could you find a better proof of this than in the study of hay-fever, of which I am about to speak. From Blackley of Manchester to Mackenzie of Baltimore you will find a succession of inquirers whose efforts to discover the nature of this malady have been accompanied by efforts equally earnest and persevering to discover its most appropriate treatment. And from America, most earnest and persevering of all countries at work, we have received the largest and best fruits of this double pursuit. And to-night the plan of treatment of hay-fever which I shall have the privilege of submitting to your consideration is entirely founded upon a physiological study of the disease. It is, however, with the results of this study only in so far as they bear broadly and directly upon treatment that I propose to occupy myself. With minute discussions as to the nature of hay-fever, its physiological and pathological relations, and the causal agencies engaged in its evolution, I shall have to-night only an indirect concern. Nevertheless, as I wish to set forth the true grounds for a rational treatment of this malady, such discussions cannot be passed over entirely.

Before proceeding further, I wish to pause for a moment, and advert to the name by which this malady is known. From nothing has medicine suffered more than from hypothetical naming. What may seem to be the correct and adequate hypothesis of to-day may become the incorrect and inadequate hypothesis of to-morrow, and when the true nature of a malady is discovered, the diffusion of the discovery is hindered, if not prevented, by the retention of a name which, established by custom and continued from convenience, conceals the truth and perpetuates the error. I could adduce few better illustrations of this than the naming of the disease under consideration. The epithets of hay-fever, hay-asthma, pollen-fever, rose-cold, and peach-cold are widely open to this objection. They withdraw the attention from internal states, and they tend to narrow our ideas of causality within the limits of outward things. It is true that the pollen of certain grasses is the most common exciting agent of the paroxysm of hay-fever, but it is also true, for it has been demonstrably proved, that the paroxysm can be excited not only by other external agents, such as light and heat and dust, but also by local affections of the nose and throat, by irritations propagated from distant parts, and by influences generated *de novo* in some part of the central nervous system. It is only of late, and through researches made for the most part in America, that we have come to a knowledge of these facts. Even there, however, the tendency to hypothetical naming continues, and the term proposed by Mackenzie of Baltimore, to whom we owe so much of what is best in our recent knowledge of this subject, is not free from grave objections. He calls the disease periodic vaso-motor coryza, but in this designation there is involved a hypothesis which to-day may be doubted, and which to-morrow may be disproved. Nor are the epithets proposed by myself—periodic specific coryza and periodic nervous coryza—free from just and grave objection. We are thus in need of a proper name for our malady. No one can be rightly framed except out of its commoner physical characteristics, and no one can be safely used unless it shall imply no hypothesis, and be capable of remaining always the same however much our theories of the disease may change. Of the innumerable persons exposed in similar, if not identical, conditions, to the exciting causes of hay-fever, only a few

are affected with the disease, and of those few there are, strange to say, scarcely any among agricultural labourers and gardeners, who are habitually exposed to the pollen of grasses believed by some authors to be the sole causal agents of the development of the asthmatic paroxysm. It seems, therefore, only fair to conclude that in the evolution of the malady some other agent than the external exciting cause must be directly concerned. Further investigation proves this conclusion to be correct. From experimental examination we learn the existence of a second factor in the production of this disease, a factor which resides in the mucous membrane of the nose, mouth, pharynx, and eyes, which mainly concerns the nerves of these parts, and which manifests itself in all their histological constituents by a peculiar irritability of reaction to certain excitants.

Furthermore, when in cases exhibiting this peculiar local irritability we pursue our inquiries into the characters of the constitutional state associated with it, we discover certain *bizarre* symptoms of disorder which belong exclusively to the nervous types of organisation, and which stamp the organism exhibiting them as specifically and pathologically "nervous."

Lastly, if, pursuing our investigations further still, we institute an analysis of the *differentiæ* distinguishing the nervous constitution in this disease from the nervous constitution of cognate affections, we are led to the conclusion that they reside for the most part in the respiratory and vaso-motor centres, and in the ganglia connecting and connected with both.

In this way we discover reasons for believing that there are three great factors concerned in the evolution of hay-fever, the nervous constitution, the irritable local state, and the exciting cause. As a general rule to which there are some remarkable exceptions, all these factors, although in varying degrees, co-operate in the development of an attack of hay-fever. Concerning each of them I have to offer a few observations which will make plain the ground upon which a rational treatment of this malady can be based.

The nervous constitution associated with hay-fever is sometimes inherited and sometimes acquired. For the most part inheritance comes from the arthritic and the nervous. When acquired, it is acquired most easily by those who are most closely subjected to the complex influences of over-civilisation, by those who lead laborious, sedentary, and intellectual lives, as well as by those who, avoiding the difficulties and discipline of life, seek luxury with ease, by those who prefer excitement to duty, and by those who become weak through failure to exercise their strength. And when once hay-fever appears it exhibits still further the closeness of its relationships to the nervous system by choosing the man before the woman, the educated before the ignorant, the gentle before the rude, the courtier before the clown. Some of the more general affinities of hay-fever are harder to be understood. It prefers the temperate to the torrid zone, it seeks the city before the country, and out of every climate which it visits it chooses for its subjects the Anglo-Saxon, or at least English-speaking, race.

And now concerning the second factor in the evolution of hay-fever—the condition of the mucous membrane of the nasal cavities and parts adjacent—we have divers and some diverse views. All observers are agreed that there is some pathological condition of the affected parts, but no two of them are agreed as to its exact nature. For my own part, I conclude from the investigations which I have pursued into the matter that there is one fundamental condition which reconciles all these varied and sometimes opposing views. This condition is one of irritability, and the irritability is of a sort which involves the nervous, vascular, lymphatic, and cellular constituents of the affected parts, and, when excited, disturbs the chemical, morphological, and secretory changes taking place therein. When this local irritability is provoked into action there arises a series of local structural changes which are all but characteristic of the paroxysm of hay-fever. The erectile tissue becomes distended, the blood-vessels are gorged with blood, groups of lymph-cells fill the lymphatic spaces, the mucosa is crowded with migrating leucocytes, younger epithelial cells are vacuolating and proliferating, secretion is increased in quantity and altered in character and composition, sensation is sharpened, altered, or benumbed, and the whole metabolism of the affected region is profoundly disordered.

These local changes are always present in the paroxysm of hay-fever, and whenever they concur and co-operate it may be safely said that hay-fever is present. When this local irritability exists in an extreme degree, almost any exciting agent—an odour, a vapour, dust, a touch, light, or heat—will quickly call forth the whole series of structural changes already described as almost exclusively characteristic of the paroxysm of hay-fever.

And now let me speak shortly of the third factor engaged in the evolution of this malady—that is of the external, exciting, or deter-

mining causes to which it is commonly ascribed. Authors in general, from Gordon in 1829 to Mackenzie in 1885, advocated the view that the paroxysm of hay-fever is due, in persons of a certain idiosyncrasy, exclusively to the action of the pollen of grasses or of flowers upon the mucous membrane of the nasal cavities and adjacent parts. In support of this view, it is contended that the disease occurs only during the season when certain grasses and flowers are in blossom, that it may be artificially induced by the application of pollen to the nasal mucous membrane, and that it may be prevented from occurring, or may be cured when present by dwelling on board ship at sea where no pollen is to be found. Now, whilst it must be admitted that these contentions are in some degree just, and that the most common exciting cause of the hay-fever paroxysm lies in the action of the pollen of certain plants upon the nasal mucous membrane, it cannot be denied that they require qualification, and that they are inadequate to a complete explanation of all the facts which make up the history of this disease.

For on this side it may be contended as proved that the malady is less common among agricultural labourers and gardeners than among other persons, that sometimes it occurs at other seasons of the year than in the hay-season, that it has been induced by local irritants in which pollen did not exist, that it has occasionally arisen in consequence of irritation in a part with which the nose is in sympathy, and that the mere action by itself of pollen upon the nasal mucous membrane is insufficient to provoke a complete paroxysm of hay-fever. For myself, I am compelled by my inquiries to adopt the view that in the evolution of almost every attack of this malady the three factors already mentioned are at work—the nervous constitution, the local irritability, the external exciting cause—and that, whilst this last is most commonly a pollen acting more in virtue of its physical characters than of its intimate nature, it may be any other agent capable of calling into action the irritability of the parts concerned in the mucous membrane of the nose.

And now, when we consider these facts and theories of hay-fever with the view of framing a rational plan of treatment, we find ourselves beset on every side with difficulties. Theoretically the objects to be achieved by treatment are—the soothing and strengthening of the general nervous system, the allaying of local irritability, and the removal of the exciting cause.

To remove the exciting cause, or, rather, speaking correctly, to remove the susceptible person from it, is to prevent the oncoming of the disease, and if you send him to sea or to the summit of some Alpine height, you will assuredly succeed. There are, however, many who cannot follow this counsel, and who must remain under the influence of the exciting cause of the malady. What can be done for the patient in such circumstances? We may strive to strengthen by tonics the weak and irritable nervous constitution, and Morell Mackenzie has had some success with valerianate of zinc and assafoetida, whilst Blackley has failed with every drug which he has tried. By common confession general treatment, although not useless, is never by itself successful.

We are therefore compelled to turn to the study of local treatment as the chief mode of relieving or curing this disease. There are three plans of local treatment:

The first plan is to *allay* the irritability of the nasal mucous membranes.

The second plan is to *exhaust* the irritability of the nasal mucous membrane.

The third plan is to remove or to modify, or to destroy by caustic, or by cautery, galvanic or igneous, such portions of the nasal mucous membrane as are found, or are believed to be, the seat of the pathogenic irritability. This third and most radical plan of treatment is practised for the most part, I believe, in America, and in the hands of Daly of Pittsburg, Roe of Rochester, and Mackenzie of Baltimore, it has been followed by lasting and signal success. But as there are not as yet at our disposal materials sufficient to form a critical estimate of the relative value of this mode of treatment, as I have myself no personal experience of the practice of it, and as in this imperfect lecture my chief object is to submit to your consideration the plan of treatment designed and practised by myself, I dismiss for the present from further consideration all operative procedures of this radical kind.

The first plan of treatment proposes to prevent or to cure hay-fever by allaying the pathogenic irritability of the mucous membrane. This was the object which I endeavoured to achieve when I began my therapeutical experiments in the treatment of this disease. From trials extending over several years, no remedies of this sort, except aconitine or atropine, returned me any results of the smallest value, and the results returned by the use of these alkaloids were so insignifi-

cant, and the effects following it were sometimes so disagreeable, that I abandoned my inquiries in this direction. The introduction of cocaine, however, and its recent employment in the treatment of hay-fever, induced me to reopen my experiments in this direction. At first my success was considerable, for three out of five cases were immediately relieved, and the relief was maintained by the frequent renewal of the application of cocaine to the nasal mucous membrane. But when, last year, my experience of the use of this drug somewhat increased, my success in using it diminished. In one case the application failed and disagreed; in another case it neither disagreed nor failed; but I was quite unable to discover in the patients the grounds of this difference of action. Nevertheless, although it appears to me that the success of cocaine as a local remedy in hay-fever has been over-rated, although the necessity of frequent application is troublesome, and although its use is not free from inconveniences which might eventually prove something worse, I am of opinion that its success and its comparative freedom from injurious consequences are sufficient to justify, with careful watching, a longer and larger trial.

There are three ways of using cocaine in the local treatment of hay-fever; it may be used in the form of a solution, of a spray, or of a nasal bougie. Personally, I prefer to use a solution varying in strength from 5 to 15 per cent., and I apply it to the interior of the nose and the back of the soft palate by means of a large camel-hair pencil attached to an aluminium shank, and bent at an appropriate angle. For use in the form of nasal bougies, from a quarter of a grain or more of the hydrochlorate of cocaine is dissolved in a mixture of gelatine and glycerine, and made of different weights and shapes, according to the peculiarities of the case in which they are to be employed. For using cocaine in the form of spray, some efficient and ingenious spray-producers have been invented. Many of them have been furnished with nozzles so constructed that the spray can be applied directly to almost any part of the nasal and pharyngeal cavities. These spray-producers, with weak cocaine solutions, are sometimes very useful in allaying the small but still troublesome irritation which, in the intervals of the hay-fever paroxysms, is apt to arise in the ears, eyes, and mouth. By the great kindness of Mr. Martindale, to whose pains, intelligence, and accuracy in matters of this kind we are all so much indebted, I am enabled to show you all these preparations of cocaine, and all the instruments wherewith they are used.

I come now to consider the second plan proposed for the local treatment of hay-fever. The object of this plan, which includes constitutional treatment, is to subdue the irritability of the nasal mucous membrane to such an extent that it shall no longer react to special or common irritants, whether pollen or dust, in a pathogenic manner. In the first place the patient is put upon such a regimen as will conduce most to the improvement of his general health. He is instructed to have a simple but liberal dietary, to be extremely moderate in the use of alcoholic stimulants, to have daily exercise, to follow early hours, and to continue, if that be possible, even at the cost of suffering, his ordinary occupations. If the patient is very weak, he is instructed to take with meals drachm doses of Easton's syrup, with three or more drops of the solution of hydrochloric of arsenic. If he is nervous as well as weak, I prescribe for him, in their full respective doses, tartarised iron, ammonium bromide, tincture of nux vomica, and solution of arseniate of soda. In some cases I think that I have seen great benefit follow the use, thrice a day, of five grains of sulphate of quinine dissolved in citric acid, and given in effervescence with carbonate of ammonia. For the strictly local treatment, there are required a common laryngeal brush and a carbolic mixture. This mixture is composed of glycerine of carbolic acid one ounce, hydrochlorate of quinine one drachm, and a two-thousandth part of perchloride of mercury. Heat will be required in order to dissolve the whole of the quinine; without heat, Mr. Martindale informs me that the glycerine of carbolic acid will dissolve only half the quantity prescribed.

Let me now describe the method of procedure to be followed in applying the carbolic acid mixture to the mucous membrane of the nasal cavities. If there is much mucus in the nostrils, cleanse them by means of a douche of warm water containing boro-glyceride¹ in the proportion of an ounce to the pint. Dip the laryngeal brush in the carbolic acid mixture, and see that the brush is full but not overflowing. Place the left hand on the left side of the forehead, and the thumb on the tip of the nose, with the shank of the brush between the thumb and two forefingers of the right hand, and the brush itself directed upwards, push it gently but firmly into one of the nostrils, carry it as high as you can without inflicting injury, move it about so as to bring the mixture in contact as much as possible with the interior of the upper part of the nostril, and then withdraw it. With another

¹ Before the introduction of boro-glyceride, I employed a five-grain solution of chlorate of potash, which was less efficient.

brush filled with the carbolic acid mixture, or with the same brush washed, dried, and replenished, you complete in the manner following the two operations required for each nostril. Having the left hand in the position already described, and the right hand holding the laryngeal brush with the hair pencil directed forwards from the body of the operator, push the brush along the floor of the nostril into the pharynx, and after ensuring free contact with the adjacent parts withdraw it. If during this operation the brush is over-full, some of the carbolic mixture will fall into the throat and excite coughing or some other discomfort. When you have thus finished the treatment of one nostril, and carefully removed any of the carbolic acid mixture which may have been spilt upon the nose or lips, you will proceed to treat the second nostril in exactly the same manner as you have dealt with the first. During the performance of these manœuvres great assistance will be obtained from the left hand of the operator being placed over the left side of the face and forehead of the patient. With this hand the operator can adjust the patient's head to the various movements of the laryngeal brush, and with the thumb of the same hand placed on the tip of the patient's nose, the opening of the nostril can be adjusted to a convenient size and shape. When the local effects of a paroxysm are severe, and have extended to the back part of the soft palate, it will be desirable to introduce through the mouth into the pharynx the laryngeal brush, moderately filled with the carbolic acid mixture, and there, by a manœuvre easily acquired and practised, to brush the posterior surface of the soft palate and the adjacent parts.

The immediate effects of these manœuvres differ in different persons and in the same person at different times. In all cases the effects are more or less disagreeable, and last from half an hour to half a day. Sometimes a little blood-stained mucus is discharged from the nose and throat, sometimes there is a slight frontal headache, sometimes there is a trivial cough, and occasionally you will have developed all the local phenomena of a paroxysm of hay-fever.

When advising a patient with hay-fever to submit to this plan of treatment for its relief, I have found it expedient to warn him beforehand of the disagreeable effects which sometimes follow the application of the carbolic mixture, and to assure him that they are both brief in duration and devoid of danger. When this warning is withheld, some patients will grossly exaggerate their sufferings, ascribe all sorts of injurious consequences to the application, and cover the physician with undeserved reproaches. Sometimes a single application of the carbolic acid mixture is sufficient to prevent for a whole season the return of the hay-fever paroxysm, and four times within my own knowledge it has never reappeared. Usually two or three applications are necessary to insure a full chance of success. The length of the interval between the applications must be determined by the character of the immediate effects. If these are mild, the applications may be renewed on alternate days; but if severe, at least three days should elapse between succeeding applications.

Of the measure of success which has followed this treatment of hay-fever, now practised over twenty years, I am unable to speak with exactitude. Patients when relieved seldom, and when unrelieved never, return to record their experiences, and I have been unable to get at the subsequent histories of more than a third of the number of persons whom I have treated. It is, however, my conviction that of this roughly estimated third whose cases I have been able to follow, a half has been cured for the season and four persons have been cured "for good." This you will say justly is not a success of which to boast. Quite so. But if you will compare the results of this treatment with the results of every other treatment, not excepting the cucaine treatment, which is its closest rival, you will have to confess that, however small may be the measure of success, it is not one which you can afford to despise. At any rate a communication of this kind is entitled to your indulgence, inasmuch as it is an honest, although very humble, endeavour to press pathology into practice and to take away the reproach which has been cast upon us of ignoring or of repudiating the natural and just alliance which should unite in closest relationships the science with the art of medicine.

LEPROSY IN RUSSIA.—A committee has been appointed at Dorpat to consider the best measures to be taken for checking the spread of leprosy in the Baltic provinces, where it is greatly on the increase.

EPILEPSY IN ITALY.—Recent statistics show that the greatest number of cases of epilepsy were met with in Liguria and Sicily during the years 1885 and 1886. At the end of last year 1,014 epileptic patients were under treatment in lunatic asylums, and 3,768 patients had been received at the different hospitals during 1883 and 1884.

SEVEN hundred Hebrew patients are said to be annually treated in the Jewish ward in the London Hospital.

LECTURES

ON

CERTAIN DISEASES OF THE JAWS.

Delivered at the Royal College of Surgeons of England, June, 1887,

By CHRISTOPHER HEATH, F.R.C.S.,
Hunterian Professor of Surgery and Pathology.

LECTURE I.—ON CYSTIC DISEASES OF THE JAWS.

MR. PRESIDENT AND GENTLEMEN,—The occupant of the Hunterian Chair of Surgery and Pathology in this College has a large choice of subjects on which to address you, and my predecessors in office have accordingly ranged at will over the domain of surgery. I propose to confine myself to a comparatively small portion of surgery, but one of no little importance, and shall have the opportunity of referring for illustration to that splendid collection of pathological specimens which, begun by Hunter, has in this special department been greatly enriched by the labours of Liston and Fergusson, and is now without a rival in its perfection.

The "Injuries and Morbid Affections of the Maxillary Bones and Antrum" was proposed as the subject of the Jacksonian Prize in this College in the year 1827, but no dissertation was sent in for competition. The same thing again occurred in 1842, and this is the more remarkable because the majority of Liston's great cases had occurred before this date, and both he and Fergusson were then actively engaged in instructing large numbers of pupils, some of whom might have reduced their teaching to paper.

In 1867, "The Injuries and Diseases of the Jaws, including those of the Antrum, with the Treatment by Operation, or otherwise," was again put forth as the subject for the Jacksonian Prize Dissertation, and having seen much of Sir William Fergusson's practice, and having myself done some little work in the same direction, I ventured to compete, and had the satisfaction both of being successful and of adding to the museum a considerable number of valuable preparations, many of which I shall bring before you.

DISEASES OF THE ANTRUM.

The antrum maxillare, or sinus of the upper jaw, was known as early as the days of Galen, but was first described with any degree of accuracy by our fellow-countryman, Nathaniel Highmore, of Sherborne, whose *Disquisitio Anatomica Corporis Humani* was published at the Hague in 1651. By the kindness of a former pupil, Mr. W. H. Williams, of Sherborne, whose wife is a direct descendant of Nathaniel Highmore, I am enabled to place before you the author's own copy of his anatomical work, bearing on the title-page the signatures of successive incumbents of the Sherborne practice. And yet it is remarkable that the copy of the same work in our College library is more perfect in containing a curious allegorical frontispiece, which is wanting in the Sherborne copy, although the *Frontis physiognomica descriptio* is there. At page 227 of this work will be found a plate illustrating (not quite correctly) the anatomy of the antrum, and from it Figs. 1 and 2 are reproduced. In another figure is shown a curiously inaccurate

Fig. 1.

Fig. 2.

rate drawing of the antrum, which, as the author says, "is more frequently empty, but is sometimes found filled with mucus, into which the humours from the head are able to distil by a certain meatus from the cavity in the frontal bone and from the ethmoid