

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

ASTHMA.

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THE writings of Dr. Saenger, of Magdeburg, on asthma have received so little attention in this country that it may be worth while to submit a condensed abstract of them to the readers of the DUBLIN JOURNAL OF MEDICAL SCIENCE. The current definition of asthma is "a neurosis characterised by recurrent attacks of dyspnœa" (this may be regarded as a statement of fact) "caused by spasm of the muscular walls of the bronchioles, associated with turgescence of the mucosa" (this is obviously a hypothesis). The cause of the assumed nervous instability is usually considered to be either an hereditary weakness or one acquired from whooping-cough or repeated bronchitis, &c.

On this hypothesis there seem to be but two courses open to us in treating the disease—either to remove the exciting agents of the nervous attacks or to strengthen the nervous system so as to enable it to resist the noxious agents in question.

The first method is that about which one reads in the journals and text-books. Our attention is drawn to the naso-pharynx as the most fertile source of the "reflex" which sets up the "neurosis." Again, we are told that a vaso-motor derangement of the mucosa is the exciting agent, or that the mechanical obstruction is due in the first instance to an inflammatory swelling. The "reflex" has been attributed to the stomach, the uterus, the ovaries, &c.

Treatment.—If we except the procedures based upon the hypothesis of a naso-pharyngeal or a gastric reflex, the treatment is purely symptomatic, and leaves the patient no better able to resist a second attack when the usual conditions recur. Therefore these patients are advised to keep themselves aloof from the

known or supposed exciting causes in their particular cases, to reside in other localities, &c. Of course general hygiene and proper diet is not neglected, and this is the only measure usually advocated to put the patient in a better condition to resist future attacks. I need not mention the quack remedies and popular nostrums which are advertised to "change the constitution, &c."

The following is a very condensed abstract of Dr. Saenger's last paper :—

The chief symptom of an asthmatic attack is breathlessness. Its cause is obviously chiefly acute pulmonary distention, by which the capacity to remove used up air and waste products and obtain fresh air is lessened. The catarrhal condition of the bronchioles adds a mechanical obstruction. The intensity of the breathlessness is greatly aggravated by the lack of sufficient time for the patient to become accustomed to the condition, as can be proved by the complete absence of such breathlessness in advanced phthisis and extreme emphysema, as well as in thoracic tumours and exudations. Besides this a psychical factor comes into action.

The nature and origin of the pulmonary distention is less easy to explain. It is obviously not caused by tonic cramp of the diaphragm. Indeed, pulmonary distention can be induced normally by exaggerated respiratory efforts. Although the expiratory muscular forces are much greater than the inspiratory, we all during violent bodily exertion inspire more forcibly than we expire. The probable reason is that expiration is usually merely passive, and when increased expiration occurs without physical cause for extra respiration, it is due to a voluntary act, such as speaking, singing, &c. Being unused then to increased expiration from physical causes when want of breath occurs, our expiration soon falls below our inspiration, and the result is a gradually increasing distention of the lungs. This point has been established by several observers.

There is no probability that the distention in asthma is caused by forcible expiration with narrowed outlet, as in players of wind instruments, &c. But the principal cause of the acute lung distention in an asthmatic attack must be found in an abnormal narrowing of the bronchioles. This narrowing naturally impedes expiration much more than it does inspiration.

An inflammatory bronchitis cannot be reckoned among the causes producing this narrowing at the start of and during an

asthmatic attack. No anatomical changes are found in the mucosa sufficient to justify the diagnosis of bronchitis, and an inflammatory attack in some cases actually lessens the asthmatic spasms.

The abnormal narrowing of the smaller bronchi must be regarded as the principal cause of the acute lung distention during an asthmatic attack. From what has been stated above it is evident that no other explanation is left for this phenomenon except that it is of nervous origin. The nervous origin may be regarded as certain, but the material bodily occurrences conditioning are purely hypothetical.

Cramp of the muscular walls is not likely, of itself, to produce such extreme and long-continued distention. Further, this does not account for the catarrhal phenomena.

The vaso-motor theory is more attractive. It can account for the swelling, distention, and the rapidity of onset, but it also leaves the catarrh unexplained, unless we assume that vaso-motor paralysis produces not alone swelling, but also increased and altered secretion of the affected mucosa, which is possible. Indeed the catarrh is explicable on the purely nervous hypothesis, as the secretion of glands is increased in quantity by nervous stimuli—*e.g.*, the salivary, lacrimal, and gastric glands, and even altered in quality, as shown by Pawlow in the case of the salivary glands.

Let the “asthma-catarrh” (so called) arise how you please, there can be no doubt but that it, like the stenosis, is purely functional.

Assuming direct nervous origin of “catarrh,” the hypothesis of a direct nervous origin will account for the stenosis. Increased activity will induce secondary hyperæmic swelling of the mucosa. But against this must be set the cases in which asthma occurs without increased secretion, and, therefore, we should not assume that the stenosis must in all cases arise from the same cause. Our present knowledge does not permit us to dogmatise as to which of the theories is to be accepted. That different bodily actions can be caused by one and the same mental cause is a well-known fact of experience.

It has been stated that asthma is at bottom a nervous disease. Is there anything in common among the various conditions that excite an attack?

An attack may arise from material or from psychical causes.

Most of the former are either characterised by some unpleasant derangement of normal respiratory sensations or by direct hindrance to respiration. These pre-asthmatic disturbances may be of various kinds. Inhalation of dust, cold air, odours, very dry or very moist air, &c.—anything that makes breathing unpleasant. Mechanical hindrances as the horizontal position, gastric distention by gas or solids, bodily exertion, sneezing, coughing, laughing, weeping, and nasal obstruction, sudden fall of barometer, &c.

In other cases the respiratory connection may not be so apparent, but it is always there. For instance, pain, shock, anxiety, surprise may produce in any one the feeling of breathlessness. Therefore, we may conclude that as all the conditions which produce an attack have this in common, that they derange our breathing, their power of causing an attack is most probably due to this respiratory disturbance. We must also conclude that all the causes of asthma, whether bodily or psychical, produce their effects by their influence upon the mind (*seelische Wirkung*). And this mental condition is essentially one in which there is a pathological direction of attention to the apparently serious state of the respiratory organs. Supposing this to occur in a patient formerly subject to severe bronchitis, nervous or functional bronchial catarrh may result. But this “catarrh” is not an attack of asthma. The latter only results when not alone is want of breath experienced, but also when the patient for some reason or other cannot make a sound “objective” critical judgment upon this want of breath. He is in fear of suffocation. The result is sudden and extreme acceleration and forcing of respiration, which, under the conditions as described earlier, produces lung distention and all the other symptoms of an attack. Conditions present at the first attack may induce other attacks, even if they are not actually accompanied by want of breath on the subsequent occasions.

In considering this question it must be remembered that attacks do not always come on suddenly, but very often gradually.

Saenger goes so far as to think it probable that asthma arises even in cases where there is no memory of antecedent bronchitis in the way described, and the objection that the first attack may occur in childhood does not hold. Children have very good memories.

Diseased conditions of the nervous system of various kinds

make the development of asthma more easy. But of themselves they do not cause asthma. The predisposition must be present—that is, the condition resulting from past bronchitis.

As regards the nasal theories. Of course nasal abnormalities can produce shortness of breath and cough, but it is quite an error to assume that they are primary causes of asthma. So far is this from being the case that Dr. Saenger has many patients cured of their asthma, but with marked nasal abnormalities, septal spurs and deflections, and polypi still untreated. Attention to the state of the stomach is more important than to that of the nose.

The influence of emphysema on the course of asthma is not what one would expect *a priori*, for experience shows that the tendency to shortness of breath and the frequency and severity of the attacks bear no constant relation to the emphysema. Saenger reports cases cured of asthma with marked emphysema, and others with severe asthma and no permanent emphysema. The objective want of breath has no fixed and unalterable relation to the subjective, and there is a mechanical as well as a nervous adaptation to the emphysema. This point is demonstrated by some of the cases recorded.

Saenger obtains the nervous adaptation by his method of treatment, which is briefly to accustom the patient gradually to bear higher and higher degrees of voluntarily produced trouble in respiration without breathlessness.

Professional singers and players of wind instruments are singularly free from asthma. The reason is obvious, and bears strongly upon the principles that should govern a correct method of treatment. These persons, by constant practice in enduring hindrances to respiration, acquire the power of enduring a breathless condition that untrained persons could not stand.

In connection with this we must remember that, as previously pointed out, some of the breathlessness in an attack of asthma is purely subjective. It is, in fact, an instance of auto-suggestion. A proof of the subjectivity of the feeling of want of air in an attack of asthma, in part at least, is found in the inefficacy of oxygen inhalation. Of course the psychical or mental factor tends to increase the activity and power of the material factors, as the greater intensity of the respiratory effort aggravates the lung distention, &c.

It is, however, in many cases not alone the greater respiratory effort, but also an alteration in its type, which assists in pro-

ducing an attack. It has been shown by Struebing that even in sound persons violent expiration with open glottis can produce the symptoms of asthma catarrh. In asthmatics the same holds good, and they have, naturally, a tendency to breathe in this fashion in order to get rid of bronchial secretion, and when they experience difficulty in so doing—*i.e.*, getting up secretion—they exhale with all the more vigour, and, therefore, aggravate their condition. As the attack proceeds, however, and control over respiration is lost, the typical asthmatic respiration appears—*viz.*, deep inspiration with shallower expiration. The inspiration is shorter, though much more effective, than the expiration. Its effect, too, is of course increased by its tendency to open the finer bronchi. Expiration can have no such tendency.

Asthma is then a peculiar traumatic neurosis whose character is determined partly by the anatomical and physiological character of the lungs and bronchi and partly by the psychical lesion which causes an abnormal anxiety in the person affected as to the serious condition of his breathing apparatus.

Treatment.—From what has gone before it is plain that mere bodily treatment cannot suffice in asthma. Mental effects certainly follow from mere bodily treatment, but they have been hitherto arrived at more or less accidentally, and are not always beneficial. We can understand how asthma has obtained the undeserved ill repute of an incurable disease. Correct treatment must deal with the mental as well as the bodily conditions, which on the one hand occasion the disease and on the other are produced by it.

Saenger's method is to produce an effect upon the mind by anti-asthmatic exercises during the intervals between attacks, which gradually accustom the patient to relatively considerable respiratory disturbance, and the body has to submit to a definite regulation of the respiration during the progress of an actual attack.

The drugs, &c., hitherto employed merely treat symptoms, lose their effect in time, and obviously produce no permanent improvement. Saenger's mechanical treatment is less pleasant for patient and doctor, but produces permanent results, and gains in efficacy every time it is employed.

The object of the treatment is to help the expiration and make it more effective. This cannot be done by increasing its violence either by the efforts of the patient or of the doctor. Nothing

can do more harm than such an attempt, as has been pointed out above. It narrows the bronchioles, causes emphysema, and induces coughing. What is to be aimed at is not to strengthen but to weaken the expiratory effort, and at the same time to make it even longer than it is already. To obtain this result inspiration must also be weakened, and so far as possible shortened. A fixed *Tempo* is established, and this rhythmic in- and ex-piration combined with lessened effort gives the intrathoracic organs a relative rest, and therefore diminishes their blood supply. The cough becomes less instant too.

In carrying out this method the outlet for the expired air must be narrowed as it is in singing, speaking, whistling, blowing, for, as has been already shown, expiration with unrestricted outlet can of itself induce breathlessness.

Whether expiration takes place with narrowed glottis or narrowed mouth is a matter of individual taste. And what means, clock or other, is employed to regulate the rhythm is unimportant. Saenger's own method is to make the patient count in even time with prolongation of the vowel sounds to a given number, and then inspire only for as long a period as it took to sound one number. The points are (1) both inspiration and expiration must be weakened; (2) expiration must be not stronger, but longer, than inspiration; and (3) the outlet in expiration must be narrowed. The patient should, if possible, inspire nasally with a sort of sniff, and the respiration should be, if possible, diaphragmatic.

It is difficult often to get the patient to carry out this treatment, but there are no bodily hindrances to doing it. The hindrances are purely mental. The patient fears suffocation if less respiratory effort is made. There is no such danger. The subjective feeling of want of air does not correspond at all to the objective.

Success in treating an attack by this method can rarely be obtained without some previous respiratory exercises practised during an interval free from asthma. These exercises are designed to give the patient the power of enduring considerable respiratory disturbances without noteworthy breathlessness (Lufthunger).

These exercises consist in singing or counting for as long as possible without inspiring. By practice an asthmatic person can learn to count up to 50, 60, 80, 100 without drawing breath, the rate being three monosyllabic numbers per second, or two

disyllabic. Or keep up the sound of a vowel for 20, 30, 40 seconds, or even a minute. These can be supplemented later by gymnastics, the spirometer, and Saenger's lung-ventilator.

Finally, the patient must practise relieving the air-hunger induced by these exercises without taking deep long-drawn inspirations.

These exercises properly carried out will endow the sufferer with the power of overcoming asthmatic symptoms at any time or in any place without drugs or other artificial assistance.

The above are, in brief, the general principles of a method of treatment calculated to cure asthma. The particular application must be left to the knowledge, skill, and attention of the medical man.

In many cases besides this control of respiration there is required also a regulation of the cough. Violent rasping and all purely voluntary coughing must be abandoned. The patient must be taught that it is not alone useless, but positively injurious. The involuntary cough must also be suppressed, so far as possible, by exercising restraint over it, by holding the breath when the cough is coming for as long as possible, and also at other times, and, of course, taking short and superficial inspirations afterwards. Voluntary deep inspiratory efforts are an abomination. What possible good can they do? At the best the only result of repletion of the lungs with oxygen can be that respiration may cease for a longer or shorter period. The common "asthma gymnastic" so-called is distinctly injurious.

THE BRITISH ANTARCTIC EXPEDITION, 1910.

IN connection with the announcement of the departure of the *Terra Nova* from the West India Docks on the 1st of June it is interesting to note that the entire medical equipment and all photographic chemicals for the expedition were supplied by Messrs. Burroughs, Wellcome & Co., of London.