ON THE PATHOLOGICAL AND THERAPEUTICAL RELATIONS OF ASTHMA, ANGINA PECTORIS, AND GASTRALGIA.

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DURING the last three or four years my attention has been drawn to an interesting pathological and therapeutical connexion between three nervous affections which are individually reckoned among the anomalies and the difficulties of practical medicine, and which, so far as I know, have not usually been directly associated with each other in the classifications of writers on nervous diseases. I refer to spasmodic asthma, angina pectoris, and gastralgia. It is true that Kneeland some years since indicated the fact that there was some connexion between asthma and angina pectoris; but, so far as I know, no author has distinctly classified these diseases as depending essentially on neurosis of the vagus; and certainly no one has yet advanced the theory that both of them, and also gastralgia (or neuralgia of the gastric nerves), are essentially dependent on neurosis of the vagus which is of central origin, and in a large majority of cases is mainly or entirely due to inherited peculiarities of the central nervous system. Such is the proposition which I now submit to you.

In so short a communication as can alone be received by this Association, it would be impossible to bring forward sufficiently detailed evidence to establish positive proof of this doctrine; nor do I pretend myself to possess such positive proof. It will be sufficient to indicate to the members the chief of those facts which, to my judgment, make the hypothesis exceedingly probable, and certainly worth following up.

The evidence arranges itself under five sections:

1. Inferences from the known physiological functions of the vagus;
2. Evidence of the interchangeability of asthma, angina, and gastralgia, in the same individual;
3. Evidence of the pathological connexion of these neuroses with neuralgia of the fifth nerve;
4. Evidence of the common dependence of asthma, angina, gastralgia, and neuralgia of the fifth, on peculiar inherited neurotic tendencies;
5. Evidence from the similarity of effects produced by certain remedies on all these maladies.

1. As regards the physiology of the vagus, there is no need to deliver a class-room lecture to the present audience. It will be enough to remind you that, besides its other offices, the pneumogastric acts as the great afferent of sensory impressions from the stomach and from the mucous surfaces of the lungs and trachea, and as the main, if not the sole, organ of cardiac sensibility; that its ramifications form an integral part of each of the various nervous plexuses in the cardiac, gastric, and respiratory territories; and that its deep origin is placed within the medulla oblongata, and united by the most intimate connections with the sensory nucleus of the fifth nerve. There are thus *primæ facie* reasons for presuming that the three neuroses, asthma, angina, and gastralgia, would all depend upon irritation of the vagus. As regards asthma, there is, I suppose, a pretty general adhesion among the best recent authorities to the theory of irritation of the pneumogastric, which is well expressed by M. Sée of Paris in an article on the Treatment of Asthma in the *Practitioner* for July 1869. As regards the pain of angina, and indeed as regards the sources of cardiac sensibility in general, there has been much dispute; but the facts seem to me to point very clearly to the belief that branches of the vagus, reinforced in the cardiac plexus by other spinal branches which come from the cervical and the uppermost dorsal cord-centres, through the medium of the sympathetic ganglia of the neck, fully account not only for heart-sensibility, but also for the curious transmission of pain in angina to the arm, the chest-wall, and the neck. The chief objection to this view has rested upon the belief that the sympathetic branches must also have a share in the production of the pain; but the idea that the sympathetic is capable of expressing sensations of pain seems to me to rest on an exceedingly doubtful basis, and to be supported chiefly by the apparent analogies of the pain of colic, gall-stone, etc., for which pains there is really a much more probable source in branches of spinal nerves. Everything in recent physiological observation seems to suggest that all the apparent cases of sensation in the sympathetic fibres are really due to branches of spinal nerves that are bound up with them. As regards angina, the only question as to which I feel much doubt is, whether the vagus centre or the cervical and upper

dorsal cord-centres just referred to are most prominently concerned in the origination of the disease; but, at any rate, it seems clear that, from the moment that serious symptoms of angina are set up, the vagus centre must be involved, since this must be the intermediate instrument of the reflex disturbances of respiration which occur during the paroxysms. On the whole, I lean strongly to the idea, which will be found expressed in the pathology chapter of my work on *Neuralgia*, that the irritative process in angina commences in the spinal centres which send branches to the cardiac plexus, and then involves the vagus secondarily, but at a very early period.

2. The second branch of the evidence that connects asthma, angina, and gastralgia, all with the same great nerve, is derived from the singular interchangeability of the three maladies. Kneeland long ago remarked that spasmodic asthma and angina were thus apt to pass the one into the other. For my own part, I can refer to several instances of the connexion between all three diseases, and would sum up the general results of what I have seen in the following terms. 1. Severe and protracted asthma nearly always becomes complicated, after a time, with symptoms which may not amount to what would commonly be called angina, but assuredly belong to the same category; and in not a few instances (I have myself seen three) asthma leads directly into declared and unmistakable angina. 2. Asthma is nearly always associated with gastralgia. It is true that the neuralgic character of the pain is very often overlooked, and it is attributed incorrectly to dyspepsia; but I have frequently had occasion to prove the fallacy of this idea, the only ground for which is, that asthmatic patients will not bear putting a large amount of food in the stomach at once. Asthmatic patients are not commonly dyspeptic in the proper sense of the word; and the epigastric pain, from which they almost all suffer more or less, requires to be dealt with as a part of the general nervous affection. 3. The chronic form of angina is, so far as I am aware, almost invariably associated with more or less gastralgia, which, as in the case of asthma, is continually being mistaken for dyspeptic pain, and treated, with very unfortunate consequences, from a gastric instead of a nervous point of view. Like asthmatics, these patients require to be fed in small meals; but nothing save harm can come of keeping them on a small total supply of nutriment.

3. The next branch of evidence for the essential interconnexion of the three neuroses of which we are speaking is derived from the way in which they are mixed up and complicated with neuralgia of the fifth nerve—a complication which, if it can be shown to occur with a certain special frequency in these diseases, would go far to trace home the *fons et origo mali* to that portion of the medulla oblongata in which the nuclei of the vagus and the fifth are found in intimate connexion with each other. Upon this point the evidence is, in my experience, exceedingly strong, and may be shortly stated thus: that, whereas neuralgia of the trigeminus is a more or less occasional complication or attendant of other neuralgias generally, it is an almost invariable complication of nervous asthma, nervous angina, and gastralgia. Of course it varies greatly in severity. It may amount, and indeed generally does, to nothing but an attack of migraine every month or six weeks; but there it is, nearly always. And, as regards gastralgia, I have seen numerous instances of its interchangeability with facial neuralgia, of which the following is perhaps the most striking. A watchmaker's assistant, aged 42, applied to me at Westminster Hospital, suffering from intermittent attacks of epigastric pain, which came on specially at times when he was exhausted from want of food, and were uncommonly severe and prostrating. After he had been under my care for ten or twelve days, these pains were abruptly superseded by violent neuralgia in the globe of the right eye and in the branches of the ophthalmic division of the right fifth nerve generally. This neuralgia was not merely severe in itself, but it ran on into secondary iritis, with destruction of the eye for visual purposes. This is the most severe case of trigeminal neuralgia complicating gastralgia that I have seen, but I have witnessed plenty of slighter ones; and, on the whole, I believe that true gastralgia, as distinguished from mere dyspeptic stomach-pain, is nearly always attended with a tendency to facial neuralgia in some form and degree.

4. In the next place, the close interconnexion of asthma, angina, and gastralgia, and their common dependence on an affection of the central nervous system, is rendered more probable by the remarkable history of inherited neurosis which the sufferers from them will always be found, upon careful inquiry, to present. This is a branch of investigation which has greatly engaged my attention; and in my work on *Neuralgia*, the results of a good many such inquiries as to the pedigree of neuralgic patients will be found. But I have not had space for everything in that work, and must probably reserve for a separate publication the remarkable facts which come out respecting the hereditary connexion of asthma and angina pectoris. Respecting

gastralgia, it has been, for obvious reasons, impossible to procure evidence of a precise and reliable character; but, as respects asthma and angina pectoris, I will go so far as to say that I believe there hardly ever existed a sufferer from one of these diseases in whose blood-relations, either of the same or previous generations, one or more examples of the other could not be found by proper inquiry; and occasionally one comes across families which seem to have been quite plague-stricken, as it were, alternately with these two maladies. And it is a singular fact that I have twice known these diseases to be the only nervous maladies that could be traced in a large family of two or three generations.

I may here properly introduce the reply to an expression of surprise which some of my audience may have on their lips, at the frequency which I ascribe to angina pectoris, which, on the contrary, has usually been considered a very rare disease. But I have already had the honour to tell this Association (at the meeting in 1868) that observation had convinced me of the error of that opinion, which arose from neglect or misunderstanding of all but the severest and suddenly fatal cases of angina; whereas there are, in fact, a multitude of cases in which the nervous affection—the cardiac neuralgia—which is the only essential portion of the disease, exists in all shades of severity, down to an exceedingly mild and trivial complaint. And my subsequent experience has strongly confirmed me in this belief, which is also expressed by some of the most careful recent writers.

5. The last, and to me personally the most interesting, link in the chain of evidence which connects together the three neuroses, asthma, angina, and gastralgia, is formed by the results of therapeutical experiment. There is one remedy which is supremely effective, where it can be tolerated, in all these three maladies; namely, arsenic. As regards angina, I may say that, since my attention was drawn to arsenic by a remarkable case published by Philipp in 1865, I have had a rather large number of severe cases to treat; but it is within the last twelve months that I have received the most conclusive proof of the power of this drug over the nervous symptoms of angina. Two examples especially illustrate this, the subjects being respectively aged 65 and 75. Each of these gentlemen was free from recognisable organic heart-disease; but there was much probability in both cases that there may have been a certain amount of ossification of the coronary arteries. Be that as it may, in both these cases arsenic, in five-minim doses of Fowler's solution three times a day, relieved the attacks very rapidly, and completely removed them in the course of about a fortnight. There had previously been daily paroxysms in each of these cases; and the elder of the two gentlemen was the more stricken with the rapidity and completeness of the relief obtained, inasmuch as he was a medical man, and was, of course, thoroughly well aware of the intractability and the formidable nature of the disease. As regards gastralgia, the efficacy of arsenic was some years ago pointed out by Dr. Leared; and I have had several opportunities of proving the correctness of his statement. But more especially is it an effective remedy in that form of gastralgia which accompanies asthma. I have for many years been accustomed to the use of arsenic in asthma, and had seen great benefits produced by its tonic effect. I had also noticed, without thinking much about it, that the tendency to gastralgia, and also to facial neuralgia, was at the same time remarkably diminished; but at present I cannot regard the coincidence as accidental. In regard to the effects of arsenic upon asthma and angina, it seems proper to refer to the facts, long disputed, but now established as true, respecting arsenic-eating in Styria. It has been ascertained beyond doubt that many natives of that country eat arsenic, with very remarkable benefit to their power of ascending steep mountains. It enables them to do this comparatively without distress to breathing and circulation. There are, however, a considerable number of persons who cannot take arsenic in the doses and for the prolonged period which are necessary to make any permanent impression upon either of the three neuroses of which we have been speaking. These patients suffer such irritation of the stomach or bowels from it, that they cannot continue it. For the relief of such persons, I beg leave again to suggest a remedy that I mentioned in my paper on Visceral Neuralgias in 1868, and which I have since found very useful in spasmodic asthma, as well as in gastralgia and angina: I mean the subcutaneous injection of strychnia in very small doses, from the 1-120th to the 1-80th or the 1-60th of a grain. I would always try the subcutaneous administration before giving the remedy by the stomach, wherever it is possible to do so; but, if this cannot be done, strychnia should be given by the mouth in doses of 1-40th to 1-24th of a grain three times a day. I think there is little doubt that strychnia also has a physiological affinity for the tract of the vagus and the trigeminal nerves; also this is much feebler than that of arsenic; hence I should always recommend that the latter be tried first.

ABSTRACT OF A CLINICAL LECTURE ON ELEPHANTIASIS GRÆCORUM.

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GENTLEMEN,—True leprosy, or elephantiasis Græcorum, is met with in two principal forms: the first is known as tubercular, the second as anæsthetic, leprosy. The latter differs from the former chiefly, but not solely, in the fact that the cutaneous nerves are especially affected, and consequently anæsthesia of the skin forms a prominent feature of the disease. The two forms are, however, not unfrequently (about 15 per cent.) met with in the same individual.

Leprosy is common in the East and West Indies, the Mauritius, Madeira, and other semitropical countries; but it also prevails to a considerable extent in Norway, Denmark, Greenland, and some parts of the Mediterranean coast. Happily at the present time it is unknown as an indigenous disease in Great Britain, though about four hundred years ago it prevailed over the whole of Europe, and these islands were not exempt. Statistics prove that it is oftener met with in males than in females, and that the age between 15 and 30 is that most liable to its attacks. It is certainly rare before puberty.

As to the causes of the disease we know but little; for, though it is confined to certain localities, one is at a loss to discover what malarial or other exciting influence exists in common on the coast of Norway, the Mediterranean, and the West Indies. It is undoubtedly sometimes hereditary, though never contagious.

It is to a case of *tubercular leprosy* that I propose particularly to draw your attention this afternoon.

Mary Anne Edmunds, aged 45, was admitted into Middlesex Hospital on October 5th, 1871. She stated that she was born of English parents in the West Indies, where she remained during the first twenty years of her life. She then resided in England for four years; subsequently she returned to the West Indies for one year, and at the age of 25 she went to live on the West Coast of Africa, and there remained until two years ago, when she again came to England, and has since lived in London. She has one brother and four sisters, all healthy. Her eldest son died in Africa; her other children, four in number, are all strong and well, and she is not aware that any member of her family has been afflicted with a similar disease.

She suffered from what she calls "climate fever" in the West Indies, but otherwise enjoyed good health, until she went to Africa, where the present disease commenced nearly six years ago. She firmly believes that it was produced by artificial means, some malicious person having rubbed her skin with a poisonous herb, and thus injured her for life. Nothing that we can say to the contrary dispels this extraordinary delusion. She describes the first symptoms as having consisted of vomiting and pain in the abdomen, with a sensation of numbness and tingling in the limbs, especially affecting the hands and feet; these were shortly followed by slight swelling of the upper and lower extremities, with some discoloration of the skin, and six months afterwards the face became similarly affected; at the same time she began to lose her sight, "a skin," as she describes it, gradually growing over her eyes.

Her state of health has changed but little during the last twelve months that I have had her under my observation, and may be briefly described as follows. She is a tall, well-formed woman, but emaciated; the hands, feet, face, and mucous membrane of the mouth and throat, are the parts of the body most seriously affected. The skin of the hands is of a darkish-brown colour, and enormously thickened by tubercular swellings, which are scattered irregularly chiefly on the dorsal aspect of the hand and wrist. The fingers are more uniformly enlarged, and measure in circumference round the middle as follows.

	Right Hand.	Left Hand.
Index finger.....	4½ inches.	4 inches.
Middle finger	4 "	3½ "
Ring finger	4 "	3½ "
Little finger	4 "	3 "

The measurements were made about the middle of each finger. The palms of the hands are comparatively free from disease; on one finger there is a large and painful tubercle, which is now increasing in size, and giving evidence that active changes are going on at this spot. She is quite unable to close the hand or even to bend the distal joints of the fingers. Brown patches of discoloration are scattered over the skin of the fore-arm, some of them reaching as high as the shoulder, while here and there a small hard lump can be felt in the skin. There is entire loss of sensibility at the back of the right wrist over a patch of skin rather larger than a crown-piece; elsewhere the sense of touch is nearly perfect, although a sensation of numbness exists. The feet, like the