ogy cannot be contradictory, but it must be remembered that it has occasionally happened that pathological and clinical observations have been the means of enabling us to define more accurately certain important physiological laws.

In conclusion, I would remark that there appears to me to be two principal reasons why the importance of uterine flexions as factors in uterine disease is doubted by some and disbelieved by others:—1. That the complaints made by women are too often treated as fanciful, whereas what is really wanting is a discriminative analysis of such complaints. 2. A want of recognition of the influence of defective nutrition in producing such alterations in the tissues of the uterus as predispose to or constitute the first stage of serious and troublesome disease of this organ.

[ERRATUM.—In the preceding section of this paper, published last week, for “sacro-sciatic,” read *utero-sacral*.]

Berkeley-square, W.

CONTRIBUTIONS TO AURAL SURGERY.

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NO. IX.—PERFORATIONS OF SHRAPNELL'S MEMBRANE.

THAT portion of the membrana tympani just above the short process of the malleus which covers a small space communicating more or less freely with the tympanic cavity, and which goes by the name of Shrapnell's membrane, possesses an interest when it is perforated altogether disproportionate to its uses in health. These uses begin as a protective membrane, and that they also end there I have convinced myself on several occasions by observing complete absence of this part when the hearing has been perfect. Perforations of the membrane of Shrapnell have received at various times brief notices at the hands of aural surgeons on the Continent and America.¹ There are certain points in connexion with this subject that will, however, I venture to think, be of sufficient interest to warrant the following remarks. When the tympanic membrane has been completely destroyed in the process of ulceration, this small area sometimes remains, and at other times is destroyed. In either case no particular importance attaches to this circumstance, since no especial symptoms manifest themselves. But there exist a certain number of cases in which the loss of tissue is altogether confined to the membrane of Shrapnell, the membrane proper remaining intact. Out of several cases of this nature, the notes of which I have before me, in no less than six the hearing was absolutely unaffected. In five others the only symptom complained of was loss of hearing, and it was sufficiently obvious, both from the history and the usual methods of examination, that the deafness in these five was due to the products of inflammation and its results within the cavity of the tympanum proper. No inconvenience of any sort resulted from the loss of the membrane of Shrapnell itself; and although there had at some distant period been a slight discharge, this had ceased for many years. The trouble, so far as the loss of the particular portion of membrane is concerned, had therefore passed; but with regard to others in which the hearing was good, there was more or less discharge from all; and although in some there was no pain, it was on account of the periods of deeply seated pain in the ear and in the region of the temporal bone that others applied for relief. In one case, that of a lady thirty-five years old, the pain had been most intense. For more than three years she had never passed a week without great suffering. There was a slight discharge. Local applications too numerous to mention had been poured into the external meatus. Hot fomentations and leeches only afforded a very temporary relief, and medicines of all sorts, such as are given for the so termed neuralgia, had been taken at various times without any appreciable effect. The periods of pain were confined to no particular time, although they prevented sleep for part of the night; they invariably followed any exposure to the external air, and for this reason the patient not only kept wool in the external canal, but covered the ear with a pad whenever she went out of doors. Beyond the entrance of air into the ear no influence, so far as could be judged, excited it. On examination of the perforation with a small eye probe

the roughness of exposed bone could be felt, but the spot was not in any way sensitive to the touch. It seemed from a consideration of the points mentioned that the best prospect of relief would be probably found in an arrangement which protected the exposed surface for a considerable time uninterruptedly from the action of the air, and, finally, the most complete comfort was afforded by a thick covering of lycopodium powder. After the ear was carefully dried, the patient was directed to blow the powder through a piece of indiarubber tubing to which was attached a small piece of fine glass tubing. By carefully directing this along the roof of the external canal the powder was scattered over the perforation in a thick layer, which was allowed to remain for four or five days without being disturbed. Under the influence of this very simple treatment the discharge quite ceased, and the pain after a few weeks did not return. Beyond this no other protection was used, and, on the last occasion of seeing the patient, who was still using it, more than a year had passed without any return. It would appear that the reason why all previous forms of protection had failed lay in the fact that between the protection and the perforation there was a column of air.

In another case of a young lady who had a discharge from the ear since childhood, by a curious coincidence precisely the same condition was present in both ears—that is, the membrane of Shrapnell was absent, the other part of the tympanic membrane being intact; there was a profuse purulent discharge from the exposed surface; when the ear was syringed and dried the hearing was perfect; there were not any bone granulations at the seat of the perforation; and lastly, there was never pain. The small polypoid growths often observed in this situation, and so difficult to eradicate, are without doubt connected with dead bone, which extends slightly forwards, and so encroaches on the roof of the external meatus. Remembering this, I cannot but think that, in those cases where pain is complained of, this is also the direction in which ulceration has taken place—(i.e., on to the roof of the exposed canal),—as a point just anterior to the membrane of Shrapnell is frequently sensitive to the touch of a probe, although the probe may be put directly into the perforation without giving pain. In the case of another patient with this form of perforation, there had been a slight discharge since childhood, but no pain or loss of hearing.

SOME NERVOUS DERANGEMENTS OF THE HEART.

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(Concluded from page 1069.)

BUT it is not with disturbance of the reproductive organs alone such “reflex palpitation” is found. Professor Botkin, of St. Petersburg, has related a case where the palpitation was due to a floating kidney. Some time ago a gentleman came under my care whose heart-disturbance was clearly linked with irritation in his prostate gland; while in the case of a young gentleman sent up to me from Liverpool the most patient investigation could find nothing to account for the sudden onset of violent attacks of palpitation, until it was quite accidentally discovered that there had also recently been developed some irritation at the anus. They came together; and, what is more, they departed together.

There are, too, hearts whose action is persistently and continuously tumultuous; where there is a great deal of actual palpitation at times, with intervals when the heart's action is quieter, but never calm. This form of neurosial derangement, for the want of a better term, I have called “the badly behaved heart;” and very bad its behaviour is in some cases. Though most frequently met with in women, it is not confined to the female sex. Recently a Mexican consulted me with such a heart. To say that it was a perfect nuisance to him is to give a feeble description of the annoyance it caused him. In this case the disturbance was clearly related to mental worry. Beyond this it had no distinct relations; it had nothing to do with effort; it preserved no times nor seasons, and stood clear of indigestion. The only matter with which it was in any way linked was “flatulence;” and in that it only obeyed the law that when elastic gas in

¹ Vide writings of Burnett, Blake, Green, and an excellent description of this lesion in Politzer's Text-book.

the alimentary canal presses upon the heart, through the thin diaphragm, it embarrasses its action. A similar heart existed in a Jewess who attended Victoria-park Hospital, who was sorely troubled by her unquiet circulatory centre. Here the disturbance also had no definite relations: sometimes it was worse, sometimes it was better, but always tumultuous and uncomfortable, and resisted treatment for a long time; but yielded at last.

The strictly gastric relations of the arhythmic heart have not yet been clearly defined. There is, of course, the embarrassment caused to the heart by gas in the stomach, but that is not, strictly, a neurosal derangement. Then there is the disturbance caused by eating indigestible food, which somehow produces an intermittent halt, or other irregular action, often of the character of impaired energy, which is explained by some by the vague phrase "due to the fibres of the vagus." But beyond the two facts that there are unquestionably gastric as well as cardiac fibres in the vagus, and that the cardiac disturbance is coexistent with times of dyspeptic trouble, it is impossible to say anything. It is just as likely that the link lies in the fibres of the sympathetic as in those of the vagus nerve. From the fact that the cardiac disturbance occurs with periods of indigestion, either due to taking improper or indigestible food, or coming on when the system is wearied (the two circumstances when this blended condition is evinced), it is just as likely, and may be more likely, that the causal condition is often exhaustion of the organic ganglia. Of course I am not prepared to deny that amidst the varied strands of the vagus there may be gastric fibrils which transmit an impression originating in the stomach to cardiac fibrils—whether those of the inhibitory or accelerator strands. In the case of a surgeon in the Indian service who suffered from intermittency at times ever since he could remember, his trouble was greatly aggravated by his residence in India. Further, it seemed to follow very certainly upon a breakfast of ham and eggs with coffee during a winter stay in the hills of the north-west. In this case the trouble was greatly relieved by severe and prolonged exertion, and if the exertion were sufficiently great it disappeared altogether. A return to an easy life invariably brought back the intermissions. (This case illustrates well the great fact that while exertion reveals the incapacity of actual disease in the valves and muscular walls of the heart, it has no effect upon neurosal conditions—indeed, in some cases improves them.) I spoke a minute ago of the various strands of the vagus nerve. Among these are "inhibitory" fibres which hold the heart back, which "rein it in" (the coachman's reins), and "accelerator" fibres which hasten its action, corresponding to the coachman's whip. The first hold back the heart when their roots in the vagus are flooded with blood; the latter hasten the action of the heart when their roots need blood. Disturbances of the heart's action may be set up through either set of fibres. When any irritation, direct or reflex, affects the inhibitory fibres of the vagus, then the heart's action is slowed and enfeebled till any exertion is impossible. In fact, the recumbent posture in bed is enforced, and movement brings on faintness when these fibres are affected in suppressed gout; and great alarm results. This, indeed, probably constitutes the "gout at the heart" you read of. When the great toe begins to swell and burn these cardiac symptoms disappear. When the accelerator nerves are the seat of irritation, paroxysms of exceedingly rapid action are set up, where the heart will beat some 200 times a minute for several hours, the paroxysm passing away as suddenly as it comes on; but leaving the heart exhausted. Such cases have come under my notice lately. In one, seen at Torquay, the patient was apparently well when quiet, but any excitement was liable to bring on one of these paroxysms of accelerated action, which not only alarmed the patient at the time, but left her very prostrate for some time after. Beyond these conditions there is that known as "the irritable heart." Here there is a certain amount of inability to bear effort in the heart. When perfect quiet is maintained the heart's action is normal; but any effort, even assuming the standing posture, will cause a marked increase in the rapidity of the heart's action, far beyond what is normal. The consequence is that greater effort is only made on necessity, and the sufferer is considerably crippled for work. The circumstances under which the "irritable heart" is induced are physical exertion and mental strain,—combined and sustained for some time. Commonly it is a hard-worked doctor, who has quite as much to do ordinarily as is good for

him; then comes an anxious case, involving broken rest for several nights, and after that the doctor finds himself with an irritable heart; and only very slowly is this condition recovered from. So Da Costa found among the soldiers in the American civil war; so I find it among civilian patients. Like all neurosal affections of the heart, it only slowly yields to remedies. Beyond the affections outlined here, there are the well-known "smoker's heart" and the "tea-drinker's heart"—conditions of perverted action due to indulgence in these two toxic agents. Some persons cannot smoke at all, others can only smoke a little Turkish tobacco in the evening; while others again merely require to avoid strong tobacco in the early part of the day. If they exceed this, each his own boundary, uncomfortable sensations are experienced, referable to the heart, whose rhythmic action is disturbed. Precisely the same occurs in other persons with tea. These are "toxic derangements" of the heart. Some persons have habitually slow-acting hearts; but this abnormality is scarcely a "derangement."

This summary will enable us to draw some broad distinctions between organic disease and neurosal affections of the heart. In the first place organic change will reveal itself in two ways: (1) by signs discoverable upon physical examination; and (2) by the physiological indications of the effects of effort,—as shortness of breath upon exertion for instance; frequently by a lessened bulk of urine, the outcome of low arterial tension. But in neurosal affections of the heart there are no such evidences; the heart on examination is found normal except there is some perverted action. In the irritable heart, however, the effects of effort are discoverable. In other cases the neurosis has its own peculiar features, which are quite unlike those of disease of the heart—i.e., of organic change. It is not necessary for me to lay stress on the fact that a neurosal condition and organic disease may coexist. It is necessary, however, for me to lay stress on this matter;—there is no evidence, at least that I have been able to find, either from my own observation or the perusal of the works of others, that a neurosal affection of the heart ever develops into organic disease as a process of development. They have no relation to each other. A neurosal affection is a nervous disturbance; an organic disease involves morbid change. Epilepsy may be merely functional, or it may be the outcome of a distinct pathological process. So we may have a "neurosal halt" in a perfectly sound heart, as well as in one undergoing fatty degeneration. Angina pectoris may be found with a heart in full textural integrity; at other times it is found with a fatty heart. The prognostic significance goes with the surroundings of each. When there are coexistent evidences of fatty degeneration, then the neurosal halt is significant, and the paroxysm of angina pectoris may end in death. When the heart walls are sound, neither causes apprehension. It is the associated conditions rather than the neurosis which weigh with us in forming our opinion of the position of the case prognostically.

As to remedial agents, the neurosal affections of the heart once more declare their want of kinship with organic disease. The combination of digitalis and iron—of such priceless value in certain cardiac conditions—is valueless in neurosal affections; often only making matters worse.

There are, then, many and valid reasons for drawing a broad distinction between the nervous derangements of the heart and those maladies which may fairly be spoken of as "heart-disease."

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THE PHYSIOLOGY OF THE FEET.

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THE International Health Exhibition will serve one of its most useful objects if it demonstrates not only the evils arising from the use of improper boots, but the form which they should have so as to avoid those evils. Any opinion as to what this should be must depend on the view taken of the functions of the parts they are intended to cover—on the physiology of the feet as well as the shape of their outlines and the anatomy of their structure.

Disregarding the action of those parts not affecting the