few days of one another. The little girl had paralysis of the right side of the face and neck and her bigger brother had acute ataxia. In both cases the onset was sudden; the girl remained paralysed, but the boy made a quick and complete recovery. The flaccid paralysis of the neck muscles in the girl and the sudden onset and short course of the illness in the boy distinguished either from encephalitis lethargica, and illustrate two of the points in differential diagnosis which I have just mentioned.

When a case arises during an epidemic it is important not only to treat the sufferer but to prevent the infection spreading to others. This is done by isolating the patient and the contacts. The virus in carriers probably soon begins to lose virulence and infectivity and most of the danger from this source is over in a fortnight, though it has been proved that the virus can live for six weeks in the nasopharynx. The value of local disinfectants is unknown, but for the sake of themselves and others contacts should use nasal sprays or douches, and gargles. Potassium permanganate and hydrogen peroxide, which kill the virus *in vitro*, are perhaps the best disinfectants.

TREATMENT.

Though it is the ideal time little can be hoped for from the treatment of cases before paralysis sets in. Diagnosis during the period of constitutional symptoms is almost impossible except at a time when the disease is epidemic, and in any case the interval between the onset and the occurrence of paralysis is very short. The only drug which has any experimental evidence in its favour is hexamine. Attacks in monkeys, which are usually fatal, were aborted or made milder when hexamine was given early enough. Its effect on man has been tested too seldom in suitable cases for much to be said about its value, but it deserves a thorough trial. Hurst has suggested that the dose should be large, up to 60 or 100 gr. a day, and no ill-effects are to be anticipated if the urine be kept alkaline by means of big and frequent doses of sodium bicarbonate and potassium citrate. Hexamine only breaks down in an acid medium, and its activity in the alkaline cerebro-spinal fluid is difficult to understand. Perhaps the virus of poliomyelitis makes the fluid in contact with it acid, and so causing the liberation of formaldehyde leads to its own destruction. If so one can understand the need for massive doses. The only other method of treatment at this stage is to inject serum from a patient who has had the disease recently, but this is unlikely to be procurable except during an epidemic.

When paralysis have occurred, absolute rest in bed is essential, until the inflammation of the cord has subsided. The patient should be kept in bed till all pain and tenderness have disappeared, for a month at least. After this the important points to bear in mind are to look after the nutrition of the paralysed muscles and to prevent them from being stretched. Even while the patient is in

bed the muscles must be kept relaxed. Massage and electrical stimulation should be avoided during this period; the muscles can be kept slack by means of pillows or sand-bags. If these fail to hold them in the neutral position, as they may, especially when both flexors and extensors are affected, splints must be used, but care must be taken to make them light and not to interfere with the blood-supply. When the patient is up the limb must be kept very warm by means of an extra wool stocking for the lower limb or an armlet for the upper limb. Gentle massage should be carried out twice daily to help in keeping the muscles well nourished, but even at this period of the illness electrical stimulation is better avoided. It may do harm in unskilful hands, and at the best is no better than massage. Plasters are only mentioned to be condemned. Splints must be worn as far as possible continuously and must be designed with care. The exact position in which the limb must be kept depends on the groups of muscles affected and the degree to which they are affected. Particular care must be taken when both flexors and extensors are weakened. In every case the splint must be specially adapted to the condition found, and the object aimed at is the prevention of any stretching of the affected muscles. It is permissible to stretch them for a brief period, but not to allow any lasting pull on them. It is often said that no improvement takes place after two years and very little after the first year, but I have seen considerable progress take place during the third year. If nutrition and relaxation of the muscles are properly attended to deformities will not develop and the operations designed to correct them will not be necessary.

FUNCTIONAL NERVOUS DISORDERS OF THE HEART.*

BY

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(Concluded from p. 139.)

IN the first portion of this address, certain functional diseases of the heart were discussed—namely, Fainting, D.A.H. and Tachycardia, and Heart Pain. We now deal with Arrhythmia, Giddiness, Night Starts, Palpitation, and Breathlessness.

4. Arrhythmia.

Certain forms of this are found preponderating amongst neurotics as contrasted with non-nervous subjects—assuming organic disease to be excluded from both. Anyone who has studied arrhythmia instrumentally over a long period must have met the sinus form in children, extrasystole in middle

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life, transient auricular flutter and even fibrillation at various ages, and been bankrupt of their elucidation on structural or toxic bases. The same applies to certain forms of paroxysmal tachycardia, as also to bradycardia not due to heart-block. The march of time detracts from the probability of latent organic disease having been a causative factor, for none develops in the group being dealt with here. Mackenzie was of the final opinion that arrhythmias are due, not to myocardial conditions primarily, but to increased or decreased activity, or loss of control of the s.a.n. or the a.v.n. or the a.v.b. and their connexions—all included in the name "genetic system." There can be little reasonable doubt that, just as other structures of the body can exhibit increased, decreased, or irregular functioning under psychical influences, so can the heart's "genetic system." And here, again, the more neurosis is considered and sought skilfully the more surely will it be discovered in the organically inexplicable arrhythmias. A patient of mine for many years began to notice extrasystole at about the age of 30. As he focused attention and anxiety upon it, it increased to such frequency that I confess to having become alarmed too. Then came, as a blessing, Mackenzie's polygraph, and a consoling interpretation of extrasystole. Applying both to my friend, his arrhythmia passed away completely for some years, but later, and to the present, whenever he has had a "worrying time at work," back comes the extrasystole, accompanied in recent years by fibrillary tremor of the orbicularis or some other facial muscles. At times his heart is on the slow side, 48, though regular, and he has had brief auricular flutter. It is not inappropriate to mention that he once began, some years ago, to notice his stools narrow. Then, being a doctor, he thought of the worst, of carcinoma of the rectum, and became constipated, with rectal pain. His dread was met by a thorough examination of the rectum, including digital by myself, sigmoidoscopic by a rectologist, and X ray. All the findings proved negative to organic disease, but positive to neurosis—namely, the spastic anal sphincter and colonic enterospasm so prevalent amongst neurotics. He has had various other alarms, and can laugh at them all, when over. The point of chief interest is that when he is having an intense focus of his anxiety, unconsciously generated, on to the idea of such a dread disease as carcinoma, his heart never troubles him, and beats with perfect regularity; presumably his "genetic system" is then out of mental focus.

5. Giddiness.

This is a prominent and distressing symptom among neurotics, particularly in those with F.N.D.H. They *do* get giddy, they occasionally *do* fall, or have to support themselves; but they *do not* "collapse" or fall dead, the underlying terror. It amounts to this that most people may have giddiness, unless in perfect training, but know it will pass off harmlessly. The neurotic,

in contrast, when he gets giddy has a tidal wave of his anxiety bursting upon his heart and on his idea of its sudden failure, functional cardiac commotion ensues, in turn corroborating his idea. Hence a vicious circle that is one of the causes of dread of streets, or of being alone. Furthermore, the apprehension of giddiness tends to foster it by the simple process of auto-suggestion.

6. Night Starts.

Very often one of the most convincing self-arguments to a neurotic in support of the existence of disease of his heart is the fact that, when lying asleep, he is liable to waken suddenly and find his heart doing something that he deems it should not, paining, palpitating, or rendering him breathless. He argues that nothing could affect his heart in tranquil, effortless sleep, except disease. The truth is that he has had a catastrophic dream, usually of falling, the dream having vanished on return of conscious thinking. The emotional cardiac commotion has wakened him even before he had time to touch bottom in his fall, and attracts his restored attention to it instantly. Such dreams are discoverable, as a rule, only when technically sought. So, as a matter of fact, far from night starts arguing for organic disease they point to a heart that is able to respond normally to an intensely concentrated emotion. Falling dreams are common in neurotics who have diurnal giddiness, and who "fight" the idea of falling dead. When night starts are found in organic heart disease they are usually traceable to the same mental mechanism, added to which is the notion that death, when due, is naturally prone to come in sleep.

7. Palpitation.

This is generally regarded by neurotics as an abnormality as soon as they attend to it, be it as normal as with exertion, or with fear. Conversely, it is sometimes surprising to note the degree of forceful action that can be present in neurotic subjects without attracting their attention if it be directed elsewhere than to the heart.

8. Breathlessness.

This is a common feeling in those with neurotic hearts. It may occur diurnally in acute attacks from emotional stimuli from without, and nocturnally from within through dreams, as do night starts. As emotion in sleep is the more intense from being uncontrolled consciously, nocturnal breathlessness, the repercussion of an anxiety dream, is alarmingly intense subjectively. It is closely akin to, and can originate true spasmodic asthma—why not, when neurosis can induce spasm in unstriped muscle elsewhere, as in the digestive tract anywhere from pharynx to anus, and in the urinary bladder?

CONCLUSION.

To recapitulate here. It is evident that every sign and symptom of neurotic heart affections can

vividly mimic those of organic heart disease, and that the functional nervous and the organic may each be pure, or commingle in varying proportions, to their mutual detriment. As diagnosticians we can all sympathise sincerely with the prophet Jeremiah when he says, "The heart is deceitful above all things, and desperately wicked: who shall know it?" As answer to Jeremiah, I should say, he shall know it best who takes the trouble to study it both organically and psychologically.

POST-GRADUATE CLINICAL DEMONSTRATION

AT THE

HAMPSTEAD GENERAL HOSPITAL.

BY

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FIRST of all I wish to discuss two patients who come once a month to remain under observation. They are both subjects of a cardiac lesion, and exhibit some features of therapeutic interest.

TWO CASES OF MITRAL STENOSIS.

The first case is a woman of 46 who has the facies we associate familiarly with mitral stenosis, a diagnosis which examination at once confirms. She has a palpable presystolic thrill at the apex, and the presystolic murmur with sharp first sound is unmistakable. The heart-rate is perfectly regular and only 68 to the minute; in fact she would be a most welcome subject to the candidate at an examination on account of the ease with which the murmur can be timed. An inquiry will be answered to the effect that she is absolutely free from symptoms of any kind, and that she has remained perfectly well for some years.

A glance at her *past history* will show the feature to which I wish particularly to refer. She was admitted to my ward in 1922 in a state of extreme decompensation—dyspnoea, cyanosis, bronchitis, oedema of the legs, and auricular fibrillation. She had been admitted to the ward on two or three previous occasions when a predecessor was in charge. With rest and the administration of digitalis she recovered in three weeks and was discharged, only to return within a month in the same condition of cardiac distress. Further treatment on the same lines enabled her to leave hospital, relieved, only to be followed by another breakdown; and within six months there were four occasions of admission to the hospital with brief intermissions of relief—a state of affairs which had been going on for some 18 months or two years. A lucky inspiration to alter the treatment in this patient has made all the difference in the world to her. Instead of the routine digitalis I put her on to pil. hydrarg. et digitalis co., which contains, with 1 gr. digitalis,

a grain of squill and of mercurial pill. It is modified to a certain extent in different hospital pharmacopœias. I believe the original was "Baillie's Pill," and certainly Guy's men recognise it as the "Guy's diuretic pill." But, whatever the modifications, the essential ingredients are present.

For over four years this patient has taken two pills daily, and so far from breaking down every few weeks she has not even manifested a symptom of any kind. She sees me every four weeks, and during this long observation I have tried if a reduction to one pill daily was adequate; but with one pill irregularity becomes evident, from which I conclude that two pills represent the optimum dose. Although it must be remembered that squills possesses a digitalis effect in itself, I expect the real reason why this patient has done so well is that the digitalis action is enhanced by the mercury, which is of course a very old observation. I have little doubt that the administration of digitalis in adequate doses accompanied by mercury would be as beneficial as this pill, and would prove the part played by the mercury. But when a patient is doing so well one's scientific enterprises are rather inhibited by the prudent desire to leave well alone. At any rate, this case reminds you of the advantage of combining mercury with digitalis in an obstinate case, or of changing to the pill containing squills.

The other out-patient (Case 2) is also one of mitral stenosis. Although she is 17 years old she looks about six years younger, and this is not an unusual condition when a cardiac lesion is acquired early in life. I cannot say how early it was in this case, but in all probability the rheumatic infection originally responsible was acquired at the age of perhaps 6 or 7, and she has attended a children's hospital both as an in-patient and an out-patient for many years, until the age limit compelled a transference to a general hospital. She, too, was admitted in a state of decompensation which was rapidly relieved by rest and digitalis. The drug was cautiously reduced while she was still an in-patient, and after it was ascertained that she remained well on a certain minimum she was discharged with instruction still to take that minimum. This is one granule of Nativelle's digitalin, gr. 1/240, corresponding, as is usually said, to 15 minims of the fresh tincture, but it is a fairly general experience that one such granule has a more vigorous effect than 15 minims. I think the therapeutic interest is that patients once thoroughly under the influence of digitalis retain its effect when a comparatively small dose is regularly given, a dose which would be quite inactive if administered at the onset of treatment.

A further point of interest here is the condition of the tonsils. These are very large and obviously septic, and I do not doubt that they were originally responsible for her infection. I have urged operation, but the parents are unwilling. Enucleation of the tonsils will of course have no influence on the valvular lesion, which will probably progress, but