trunk injury without sufficient clinical evidence to support any of his conclusions : alternatively the physician may concentrate his energies on examination of the spinal cord and brain to the exclusion of other possibilities. A certain number of cases can be diagnosed simply and rapidly, but every now and then a case presents itself which offers considerable difficulty and can only be solved by a careful and detailed examination and deductions.

ELECTRICAL TREATMENT IN RHEUMATIC CONDITIONS.¹

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Basic Diagnoses.—Lumbago, sciatica, rheumatism, yes, and even arthritis, are to my mind merely conventional names, and are in no sense diagnoses. Of this I can assure you, that if you employ these terms as diagnoses, and on them base your prescriptions for electrical treatments, many disappointing results will await you. I will go even further and state that because this has been done in the past, extensive discredit and disbelief in the value of electrical currents has been engendered.

Consider for a moment this situation. A patient comes into your consulting-room and complains of a pain or ache in the back ; and, after listening to him and examining him, you tell him he has "lumbago," and he goes away and tells his friends the doctor has diagnosed his complaint, and he has got "lumbago." How ridiculous ! If at the end of the consultation you were to say to this patient you have got an ache in your back, he would naturally be annoyed and tell you that that was what he told you on entering the room. But in actual fact that is all you have said, for the meaning of the word "lumbago" is pain in the loin.

Even rheumatism is derived from rheum, meaning the mucous discharge from the nostrils. If then we allow these names to lull us into a feeling of having made a diagnosis, we shall check progress towards real knowledge and continue to treat symptoms that may be, and usually are, only outlying manifestations of some general condition of the patient as a whole.

It will be asked at once whether I am prepared to substitute basic diagnoses for these symptomatic names. The answer is in the negative. For some years they must be retained as a temporary means of conventional communication between patient and doctor, and doctor and doctor. But there is a way in which a preliminary and honest mental break from these stupid so-called diagnoses may be made. If on our case sheets we write, Lumbago —? we have admitted to ourselves that lumbago is not a diagnosis ; we have reserved our judgment on the basic cause ; we have obviously had the patient under consideration as a whole ; and, above all, we have provided a continual stimulus to hunt for the cause.

If I write, Lumbago—cholecystitis, it is obvious that though diathermy may relieve and palliate the symptoms, it is our duty to inform the patient that the treatment is merely palliative and chancy and cannot be expected to cure him, and that other measures are required.

¹ Delivered at the British Red Cross Clinic for Rheumatism, December 6, 1932.

The Medical Staff of the British Red Cross Clinic has, after nearly three years' experience, unanimously come to the conclusion that a nomenclature based on ætiology is the only way along which progress can be made. They visualize ultimately being able to get away entirely from names like rheumatoid arthritis, but they also realize that progress along these lines must be gradual and, for the reasons given above, they still adhere to some of the old conventional names.

The time at my disposal does not permit me to go into any detailed description of the technique we employ at the Clinic for the ordinary palliative electrical currents. It is sufficient to say that this technique does not differ greatly from the usual technique employed in any ordinary electrical department, whether it is diathermy, ionization, light baths, faradic stimulation, radiant or infra-red heat, etc.

I propose, therefore, this evening to leave these routine procedures on one side and give point to my opening remarks by showing you some currents that either aim at improving our means of diagnosis or attempt to deal more nearly with the basic causes of patients' symptoms.

The Sub-faradic Test.—About 1894 Henry Head produced his work on "Peripheral Sensations in Relation to Visceral Disease" (*Brain*, 1893, xvi, and 1894, xvii, 399).

In this he laid it down : (1) That the skin areas associated with the distribution of pain fibres were the only ones to be relied upon as having any accurate association with diseased conditions of the viscera.

(2) That these areas of hyperalgesia must not be confused with areas of hyperæsthesia, the latter being definitely unreliable.

(3) That when a test was positive it was a result of a higher cerebral interpretation and not due to any local change in the skin area itself.

(4) That he had tried the faradic current for estimating the existence of these areas and failed to find it of any value.

For many years I had been interested in Head's zones of hyperalgesia and I discussed with him his reasons for condemning the faradic current, and they appeared to provide an opening for experimentation with alterations in his technique that might overcome his objections. About the same time I came into close touch with Dr. Naunton Davis' method of galvano-acupuncture for persistent neuritic pains. I employed his testing technique in cases with positive Head's areas and at once began to obtain interesting and hopeful results. The method I now employ is as follows : Any faradic coil not of the Bristow type (the more primitive the better) is suitable. The patient holds an indifferent electrode between his hands ; the active electrode is a small knob about the size of an ordinary collar-stud head, covered with chamois leather and thoroughly moistened with saline solution. The current is turned on until the patient is just aware of it, and the knob is then passed systematically over the surface of the abdomen which is kept well damped with saline solution. The patient is instructed to discriminate between mere increase in sensation and a change in its character. The method of interpreting the test is as follows :—

(1) If the current feels the same everywhere, or merely feels stronger here and there over one or more defined areas, the test is negative.

(2) If the current feels needly and uncomfortable, the area should be regarded with suspicion.

(3) If the current feels hot, needly and definitely painful and produces a deep-seated dull ache, it is strong evidence that some actual absorption is going on in one of the organs corresponding to the area.

The test when clearly positive is extremely useful in providing both doctor and patient with definite evidence that further investigation is justified. It should not be stressed further than this and is in no sense a diagnosis.

This test is invaluable to me and has proved itself so many times, but it has a number of serious drawbacks. Chief among them is the fact that it is only of value in patients with a reasonably calm, discriminative, critical appreciation of the sensations produced by the current. It is of little or no use therefore in the less intelligent class of hospital patient or in the neurotically inclined private patient. Also it is not possible with it to demonstrate either visually or auditorily a positive response, while the variation in the resistance of patients' skins is a further handicap.

For a number of years therefore I have been working to overcome these drawbacks, feeling convinced that since a local electrical current was able to define Head's area, his original contention that there was no local change must be at fault. After many experiments and failures I have had constructed for me an apparatus that is independent of the patient's interpretations of the sensations, imparts no current to the patient, and therefore not only produces no painful sensation like the faradic current, but the patient is unaware of any sensation whatever except touch, and finally it is able to deflect a galvanometer needle or string. This apparatus which I have named the valve voltmeter is in effect a sensitive measurer of the skin current that has always to be balanced out in the preliminary adjustments of an electro-cardiographic tracing.

The principle, stated in its simplest terms, is so to employ valves that any minute change of voltage applied to the grid of the first valve is multiplied up and transferred to a milliammeter. A minute change of voltage applied to the input, that is, applied between grid and filament of a screened grid valve, produces a change of plate current in the valve. This plate current is passed through a very high resistance, across which it produces a considerable voltage drop, a voltage many times greater than the input voltage. This voltage is applied to the grid of a further valve, this time a small power valve, in whose plate current it produces a change which is easily measured by a milliammeter. Thus a small voltage change on the skin produces a considerable deflection of a galvanometer needle which is very easily observed. This change of voltage is found in the skin current, and the preliminary tests lead me to believe that Head's areas of hyperalgesia are in reality areas where increased skin currents manifest themselves. The apparatus is capable of measuring differences of voltages of 1 to 2 millivolts.

It is still only in the experimental stage, but I felt sure it would interest you to see it, as it will help you to realize that the field of electrical diagnostic help is not completed by X-rays, electro-cardiograph, etc., but has undoubtedly many prizes still to give to the student of physical medicine who will concentrate on diagnosis and leave treatment to follow, as it will, each diagnostic advance.

(Cases were then shown illustrating the sub-faradic test, the use of the valve voltmeter, and a further case was treated by the Naunton Davis method of galvano-acupuncture.)

The Lymphatic System.—This has held my interest since 1912, when in Professor Aschoff's laboratory in Freiburg I cut sections of the lymphatic tissues of post-mortem

cases, and from tonsils to appendix invariably found the same microscopic changes. I therefore said if a change can be effected in one part of this system, the whole system may be affected. Now it is common knowledge that tissues burnt or fulgurated with the diathermy current heal better and in a different way to tissues burnt with other forms of cautery. Investigations carried out at the Royal Free Hospital, chiefly by Professor Hadfield and Miss Barry, F.R.C.S., showed that round any diathermy burn there was a zone of intense small round-celled lymphocytes.

The Oudin Current.—In America it is a common practice to destroy the whole tonsil in about six stages with diathermy or its near cousin the Oudin current. On copying their technique, I soon found this was not only an unsatisfactory procedure as compared with surgical removal, but that the symptomatic stir up of the patient might be and often was excessive. Test fulgurations with one tiny area on each tonsil, to find out if patients were likely to respond excessively, produced the interesting result that symptoms were frequently improved, and that by very gradually increasing the tiny areas (not in size but in number) further symptomatic improvement followed.

If tonsils so treated in carefully selected cases are observed some six months after treatment they appear to be altogether more healthy, and the adjacent lymphatic glands are less tender and palpable.

It is not conceivable that the mere destruction of two to four pieces of tonsillar tissue, each not larger than a good-sized pin's head, can be really adequate in any way as a sufficient actual removal of unhealthy tonsillar tissue to re-establish health. Other explanations must be sought. It seems possible that the lymphocytic zone which means either a manufacture or a movement of these cells in the lymphatic system may play a part. Perhaps the destruction of a number of the infecting bacteria may act as a kind of autogenous vaccine or a mild form of protein shock may be responsible.

It is interesting to speculate on the possibilities, but whatever the cause the clinical fact remains that this simple method of treating the tonsils—regarding these as the open and accessible mouth of the lymphatic system—effects genuine improvement, particularly in cases of swollen and painful joints with adjacent, tender, lymphatic glands.

Again, time does not permit in this review to give you the differential selection of cases for treatment by this method or by surgical removal. One example on each side may be given. The very bulky pale tonsil with laden crypts from which pus can be squeezed out of the supra-tonsillar fossa does not lend itself to this reconditioning procedure. Whereas the medium-sized tonsil that has a history of recurrent sore throats, in a patient with some intercurrent condition, making surgical removal questionable, is particularly suitable to be given two or three treatments. If such treatments do not change the symptoms, further efforts are likely to be even more disappointing. The final results when this method is used must be judged by the patient's condition, not the look of the tonsils or the space between the pillars.

These opinions closely coincide with those of my clinical assistant, Dr. W. S. Gross, whom I have encouraged, after an initial start to ensure a similar terminology for our technique, to work independently and freely on the clinical material at the Clinic. He has very kindly come here this evening to show you a number of cases treated by this method, cases months after treatment, cases under treatment, and to demonstrate to you the technique he has evolved from clinical experience. My own technique and the current I employ are somewhat different; but not, I think, sufficiently to alter the

clinical results. The principle is the same in both techniques, and may, for want of a better term, be called "counter-irritative fulguration," to distinguish it from destructive fulguration.

Dr. Gross then showed a number of cases with articular and other manifestations that were or had been under treatment. He also demonstrated the technique he had evolved. The following case is an example of the best type of result obtained from this technique :—

E. O., aged 58. Occupation, clerk. *Diagnosis*: Chronic arthritis, lumbar spine, tonsillar psoriasis.

History.—Rheumatic fever at 12, muscular rheumatism at 18, sciatica on and off since 20. Began to have pain in the lower back in 1920. Two remaining teeth healthy, tonsils large and jagged, anterior pillars blue. Glands on both sides of neck enlarged.

Course.—March, 1931, to December, 1931. Was given eight diathermy treatments to tonsils, with the result he became entirely free of pain, felt very well, and walked easily. He has remained so since.

Note.—The glands are now soft and not tender, and the tonsils are small, elastic, pink, and with smooth surface.

The Kromayer Lamp.—Generalized effects on the lymphatic system can also be secured by the employment of a special technique I have evolved with the Kromayer lamp.

Cases suitable for this technique are found among those with evidence of tenderness and loss of elasticity in the glands, particularly if this condition is present in either the long-backed or asthenic type of patient.

Here, again, it was chance drew my attention to the effects that seem peculiar to this apparatus. A student at the Royal Free Hospital asked if she might experiment on a patient with an enlarged pre-patellar bursa of long standing. I agreed on condition that she carried on the treatment for six months and kept accurate records by means of plaster casts. Long before the end of this time she brought the patient and the cases showing the progressive diminution and eventual disappearance of the bursa.

Since bursal tissues are closely associated with lymphatic tissues, it seemed reasonable to try this lamp on glands in the neck, although no such rapid improvement had been noted in these cases when treated with varying doses of other forms of light, including the ordinary mercury-vapour lamp. Clinical experience very soon showed that improved results were obtained, particularly when pressure on the overlying tissues was carried out at the same time.

Professor Merton was asked whether he could offer any explanation of why a water-cooled mercury-vapour lamp (Kromayer) on the skin produced a better clinical result than an air-cooled mercury-vapour lamp away from the skin, though area and intensity of erythema were kept identical. His explanation is that the Kromayer possesses, owing to the absence of an air space and the filtration of the circulating water, an isolated narrow beam of infra-red rays which is capable of considerable tissue penetration and that the clinical effects were probably due to this beam and not to the ultra-violet light. Certainly his explanation also explains why rendering the superficial parts anæmic by pressure helps clinical results.

The why and the wherefore of these clinical results with the Kromayer lamp want further investigation, but without waiting for this I can assure you with all the emphasis

possible that this is a good technique and yields a high percentage of successful results, and since its effects are carried throughout the lymphatic system, approaches the ideal of a basic treatment in the same way as diphtheria antitoxin is a basic treatment. I will now demonstrate on a case the selection of areas, the dosage, and method of application.

Conclusion.—In conclusion, may I repeat that I have warned you against the disappointments that will follow if you employ electrical currents without a sound physiological reason for their employment, or because you want to do something for the patient. A new method and apparatus for diagnosis has been demonstrated and cases shown illustrative of the importance of basic diagnoses in the treatment of rheumatism. Finally, the majority of our successful results at the British Red Cross Clinic for Rheumatism come from the fact that the patient as a whole entity is sent to us for consultation and advice, and for the prescription of such treatment, medicinal, dietetic, or physical, as we think best. He is not sent to us with a request for an electrical current to a particular site.

ACUTE THYREOIDITIS.

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ALTHOUGH almost every infectious disease is likely to be the source of acute or chronic thyreoiditis, in the experience of the majority of surgeons this clinical entity is located by them more frequently in textbooks than in everyday practice.

Thyreoiditis is rarer than strumitis, for the gland is seldom subject to inflammation, and a termination in suppuration is also rare indeed. In acute infections, a light inflammation of the thyreoid is often an accessory sign, particularly in the early stages of syphilis, in more than half these cases. Instances of severe alcoholism and tuberculosis show slight sclerotic processes, but more severe inflammatory changes are observable after attacks of malaria, influenza, typhoid, &c., and particularly following acute articular rheumatism and angina. Demme and Brisson report even epidemics of thyreoiditis having followed measles.

Acute thyreoiditis which does not go on to suppuration has a sudden onset, with general symptoms and fever. The gland swells, local symptoms of pressure arise, and severe pains begin to radiate to the ear and the throat. Usually after a quickly arriving climax there is a subsidence of all these phenomena.

Author's Case Report.—A 27-year-old woman, mother of one child, complained of severe pain in her neck on attempting to swallow. She gave no previous history, until questioning evoked the fact that one month previous, suffering from constipation, she strained herself and felt a sudden sensation as though something had burst in her neck.

A few weeks later she had a mild tonsillitis, and it was then that she began to feel a slight tenderness in her neck. She did not pay much attention to it until one morning she woke up unable to swallow.

On examination an extremely sensitive and painful swelling was found between