REVIEWS.

DIATHERMY.

By ELKIN P. CUMBERBATCH, M.A., B.M., F.R.C.P. Pp. 560. Wm. Heinemann (Medical Books) Ltd, 1937. Price 21/-.

We are glad to welcome a third edition of Dr. Cumberbatch's well known work on diathermy. The fact that another has been called for is sufficient evidence of its popularity. It makes its appearance in a greatly enlarged form due not only to the advance in knowledge of diathermy and diathermotherapy, but to the addition of some chapters on short wave and inductive-thermic treatment.

The first two chapters are devoted to an introduction to 'electro-thermic treatment in general and a history of its evolution from the study of high frequency currents. The third chapter deals with physical principles, and has been contributed by Dr. H. J. Taylor, who says in the opening paragraph that a certain knowledge of physics will be taken for granted—we think a good deal more than that possessed by the average medical reader.

High frequency currents and the electro-technical principles underlying their production are fully considered in the fourth chapter and the clarity of their description is enhanced by the introduction of some very good diagrams.

Part 2, which immediately follows, is divided into four sections, each of which deals with a medical electrothermic method of treatment. The first to be considered (Section 1) is diathermy or diathermotherapy, which is defined as a method in which the body or a region of it is included between a pair of electrodes and placed on the path of a high frequency current. The various forms of spark gap generators are fully described and illustrated in chapter 6 and a brief reference is made to the valve type of machine.

In a subsequent chapter various experiments in connection with the heating of the body by the diathermic current, are detailed. As the writer points out, there are very few regions of the body into which it is possible to insert thermometers, so that in most parts it is still undecided whether their temperature can be raised by the current. This is because of the latter's peculiarities and the complexity of the body as a conductor. It is therefore suggested

that the most helpful way of studying the heating of the living subject by the diathermic current, is to arrange the current first to include the upper extremities, afterwards place the lower extremities in the circuit and lastly the trunk or some portion of it, noting the rises of temperature that occur in the parts that can be measured.

The various ways of subjecting the body to diathermy are fully dealt with in chapter 8. Under local diathermy are described the "stable" and "labile" methods with illustrations of the electrodes most commonly in use. The condenser couch and condenser electrodes are also described. General diathermy receives full consideration and the production of higher degrees of general diathermy (electroprexia) is described at length.

In chapter 9, the action of diathermy on the body in health is briefly considered. It is interesting to note that the explanation of the inability of high frequency oscillating currents to stimulate muscle or nerve depends not only on its strength but also on the time it lasts. If its duration is exceedingly short its power to stimulate is reduced or even lost. The influence of diathermy on the circulation and on the arterial blood pressure are adequately dealt with in this chapter.

Discussing the mode of action of the diathermic current, Dr. Cumberbatch clearly states his opinion that the therapeutic effects which follow its passage through the body are those of heat, and it serves no useful purpose to assume that high frequency currents can cure or relieve disease in any other way. He draws attention to the fact that the inability to find explanations—other than those which themselves required explaining—of the method of action of high frequency currents on the body, in the days when they were first used for therapeutic purposes caused high frequency treatment gradually to fall into a "slough of despond" from which it was rescued only when it was taught that the therapeutic effects of these currents were due to the production of heat.

The treatment of subnormal temperature and deficient physiological activity (hypothermia) is fully described in a later

chapter. The chapters dealing with the use of diathermy in prostatic conditions and in gynaecological affections are among the most striking in the book and should be read and re-read by every practitioner who comes across cases of these kinds. In the chapter on medical diathermy in chronic arthritis contributed by Dr. Robinson, we wonder if most physicians would agree that "infective, atrophic or rheumatoid" arthritis is in the vast majority of cases due to a focus of infection situated in the cervix in women and in the prostate in men. As nearly as many sufferers from rheumatoid arthritis in women are unmarried as married, this seems rather a sweeping statement. It should also be recognized that true rheumatoid arthritis is uncommon in men. Laxity in terminology detracts greatly from the value of this particular chapter as for example the use of infective and rheumatoid arthritis as synonymous terms, in spite of the fact that most authorities regard the two conditions as distinct clinical entities. Subsequent chapters treat of the employment of diathermy in fibrositis, coccydynia and metatarsalgia, diseases of the cardiovascular system, nervous disorders and respiratory diseases.

Mr. H. B. Stallard contributes a chapter on medical diathermy in ophthalmology and the section concludes with a few words on effluviation and etincellage.

Section 3 is devoted to short wave therapy. In the introduction to this part of the work it is pointed out that electromagnetic (Hertzian) waves are emitted from circuits in which electric currents are oscillating. When the frequency of the oscillation is 1,000,000 cycles per second, the waves have a length of 300 metres, the wave length being inversely proportional to the frequency of the oscillation. Currents that oscillate with frequencies of 10,000,000 or more cycles per second and produce waves of 30 metres or less are employed in the so-called short-wave therapy. Short-wave treatment may consequently be defined as a therapeutic procedure in which the body is included in the circuit of a current that oscillates with a frequency high enough (ten million or more cycles per second) to produce short waves (thirty metres in length or less). It is also pointed out that the expression

"short-wave" treatment is inexact as it would be more precise to state the frequency of the oscillation rather than the length of the waves emitted. The various instruments in use are well described and reference is made to the indications for the employment of this method of treatment. The physiological and therapeutic changes that these currents can produce can rationally be attributed to the action of heat.

The inductotherm is fully described in Section 4. This word has been selected as a name for the heat that is generated in the body by high frequency currents by the process of induction. The body itself is not included in the circuit of the inducing current. It is very much the same in principle as the treatment by "auto-conduction" which was introduced by Professor d'Arsonval towards the end of last century. The induction of "eddy currents," as they are sometimes called, has been used in the treatment of cystitis, bronchial asthma, gonococcal arthritis. Claims are made for the improvement of cases of disseminated sclerosis under their use. Part 3 is taken up entirely with surgical electrothermic methods viz.—electrodesiccation (fulguration), electrocoagulation (diathermic coagulation); surgical diathermic treatment; electrosection (endothermic knife operation); arc operation. Each of these methods is fully dealt with and a large number of cases are quoted showing their use in growths and other abnormalities of the skin, diseases of the upper air passages, etc.

The chapter on prostatic obstruction has been written by Mr. Kenneth Walker, while that on surgical electrothermic methods in ophthalmology is by Mr. Stallard. A short chapter on electrothermic methods in diseases peculiar to women completes the book.

There can be no doubt that Dr. Cumberbatch's work has now established itself as a classic and is regarded as the chief authority on diathermy in the English language. The sane and temperate views so admirably set forth render its perusal particularly pleasant. No practising electrotherapist can afford to be without this book, while the general physician will find in its pages many valuable hints as to the indications for diathermotherapy.