

RADIUM AND ITS USES IN MEDICINE.

With Mme. Curie the great discoverer of Radium recently a guest in this country our interest has naturally been sharpened in her discovery, and the excellent article on Radium and its Uses in Medicine which is contributed by Mr. W. S. Fox to *St. George's Hospital Gazette* provides very practical information. He writes as follows:—

The physical phenomena of radium are of extreme interest, but there are many reasons why I will not go into them in the present article—after the manner of the mayor of the small town who was remonstrated with by Queen Elizabeth for not having the church bells rung when she entered the town, and who replied as follows: “Your Majesty, there are forty-nine reasons why the church bells were not rung on your entrance; firstly, there are no church bells.” And Her Majesty was graciously pleased to overlook the other forty-eight reasons; and in the present instance there are forty-nine reasons why we will not go into the physical properties of radium, firstly, because I do not know anything about them, and the rest do not matter; also, it is a somewhat dangerous subject to dabble in in a small way, as one is apt, without knowing it, to talk considerable nonsense.

A few elementary facts must, however, be referred to. The radiation from radium is divided into three classes of rays, known as Alpha, Beta, and Gamma. The Alpha rays are extremely soft, that is to say, they penetrate only a very short way, so that in a freshly prepared applicator the varnish itself is generally sufficient to cut out the whole of the Alpha rays. After the applicator has been kept three or four months, however, the varnish tends to oxidize, and a certain amount of the Alpha rays come through; also, these rays frequently get through cracks in the varnish, which commonly occur after the applicator has been kept a short time. They are, however, easily cut out with one layer of gutta-percha. They produce an inflammation of the skin, and are therefore rather to be avoided, also their curative effect is probably very small. The Alpha rays are electro-positive, charging ions positively. Beta rays are electro-negative, are more penetrating than the Alpha, and less so than the Gamma. They have considerable curative effect, and in all probability the hard Beta is the most important from a therapeutic point of view. The Beta rays are generally subdivided into three classes: soft, medium and hard. Whereas 1 mm. of aluminium will cut out the whole of

the Alpha rays, it requires 5 mm. of lead to eliminate all the three groups of Beta rays, allowing the Gamma to come through pure. Gamma rays are supposed to resemble those rays coming from an X-ray tube, where the tube has been used for some time and is fairly hard; the therapeutic effects, however, are not quite the same. The French school tend particularly to use the Gamma pure, that is to say, producing a curative effect without getting any inflammatory disturbance on the surface at all. This is especially of use where one is dealing with a subcutaneous nodule or something deep. In opposition to this view, however, I understand that the London Radium Institute has been treating cases of rodent ulcer with very little or no screen and getting excellent results in spite of, or possibly because of, the increased surface reaction. There are some conditions, such as port-wine stain, where one, of course, requires the softer rays.

With regard to the applicators, in treating skin conditions radium is generally spread out on a flat metal stud, either square or circular, and is covered with a specially prepared varnish. The varnish has to be applied very carefully, each coat having to dry first before another is applied, so that it takes several weeks to prepare an applicator. The square-shaped applicators are generally more useful, as in dealing with a large area one can make the sides of the area coincide better. In dealing with internal organs or tumours, radium is used in tubes either of glass or platinum, which are buried in the tumour for a certain length of time, or passed into the oesophagus, rectum, or whatever passage is requiring treatment. Radium is always spoken of in terms of radium bromide pure, but, as a matter of fact, in use the sulphate is the salt which is generally employed, as it is insoluble.

The diseases of the skin in particular for which radium is of use are as follows:—

- (1) Congenital deformities, such as *nævi* and moles.
- (2) Hypertrophic scars following burns, and true keloid conditions.
- (3) Fibromata, lichenification, small chronic patches of eczema and psoriasis, localized patches of pruritus, lupus and lupus erythematosus, rodent ulcer, epitheliomata, Paget's disease, sarcoma.

Nævi.—Radium is of use for all forms of vascular *nævi*, whether large cavernous *nævi*, capillary *nævi*, or port-wine stain. It is particularly of use in the port-wine stain and large cavernous *nævi*, which, owing to their position, are inoperable. It works quite satisfactorily

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