

the rays. If we consider the different kinds of cancer we see that a small dose can transform a lymphosarcoma, where a larger dose is necessary for ordinary sarcomas, and doses still larger for the different kinds of epitheliomata. But experience shows many exceptions to what I am now stating; and I have met with epitheliomata easily transformed and ordinary sarcomas difficult to transform.

If we consider eczema we find that rebellious eczema to be transformed by radium by selective manner needs absorption in its elements of very small quantity of rays; keloids need a larger quantity of rays than eczema. In a case of flat angioma of the scalp a cure has been obtained without the slightest inflammation or burning of the surface; the epidermis was still there and undamaged. Nevertheless, the tissues under the epidermis were entirely changed; the big enlarged vessels had disappeared; so also the sebaceous glands. Evidently, it was a fibrous change which has taken place. All these transformations were due to selective action of radium.

We are now ready to look over the clinical part of the subject, and I will, before dwelling with the cases themselves, show in what consists the radioactive energy of radium, and how the instruments are constructed for therapeutical use, and how the rays can be dosed and utilized.

Radium is an element discovered in Paris by Professor and Me. Curie ten years ago, out of pitchblend (oxide of uranium), an element which has the property of emitting a gas named emanation and rays named Alpha, Beta, and Gamma. The gas emanation has no penetrating power; it does not go through substances, and any cover retains it; so it can only be utilized when radium's salts are free, for example, when in solutions. In that way radium may be therapeutically useful, and I have given the name of emaniferous methods to those which utilize the emanation; but I will leave this question to the end of my lecture.

The methods which are usually and commonly employed are the *radiferous methods*. The radium rays are of three different kinds—alpha, beta and gamma rays.

By interposing a screen, we change the quantity of the rays and produce at the same time a radiation composed of rays of weak number it is true, *but having a strong power of penetration*. This is the principle of the so-called filtration that I began using in March, 1905.

The filtration represents a distinct progress in radiumtherapy. Its chief advantages are the following:

1. By cutting out the weak penetrative rays it permits the