

period of an added inflammation at the skin surface, or of the tissues treated.

If the cure of a lesion is obtained only at the cost of irritating it—of inflaming the skin which covers it—then the action has been, not specific, but destructive.

If, on the contrary, the pathological tissues are modified or cured without inflammatory action, then "specific" action will have occurred.

Radium, which has the power, as has been known for a long time, of destroying tissues, is also, according to these observers, capable of acting in a specific manner on certain pathological tissues. The importance of this theory is evident, since it implies that radium possesses the power of curing lesions without inflammation, the integrity of the skin surface being preserved. If, therefore, a lesion is deeply situated and covered with healthy skin, and if this lesion comes within the range of the specific action of radium, it will be possible to effect a cure without the necessity of destroying the skin.

Drs. Wickham and Degrais hold that the following affections are thus "specifically" modified by radium:

1. *Cancer*.—A vegetating epithelioma, a rodent ulcer, can be so modified that it disappears and is replaced by good cicatricial tissue, the process being a simple transformation without any added inflammatory action. Regression may be produced also in a cancerous tumour beneath the skin surface, for example, in the breast, without the skin being affected at any time during the treatment. They conclude, therefore, that radium exercises a *specific* action on cancerous neoplasms.

2. *Tuberous Angiomata*.—They find that angiomatous tumours of the lip, tongue, and skin, and vascular tumours situated below the skin diminish and disappear by simple transformation without damage to the skin.

3. *Cheiloids* are similarly affected, and may be caused to disappear without irritation.

4. In the same class of cases can be placed chronic pruriginous skin affections—for example, lichenoid eczemas and neuro-dermites; these affections can be modified and cured without added irritation.

The interest of this alleged specific action of radium on the four classes of cases just mentioned (there are others) is enhanced when the very different action of radium on many other affections is considered. As an example, pigmented naevi, tubercle of the skin, fibrous cicatricial bands complicating cicatrices, etc., are affections which, to be cured by radium, must be destroyed. In these conditions another property of radium equally interesting and valuable is called into play—its power of special destruction, a destruction effected without pain, and followed by repair, which cosmetically is satisfactory.

The desired specific effect of radium can be obtained only by the use of special technique and special doses. The first questions to be decided are as to the manner of the application and the dose which does not produce inflammation.

At one time it was thought that the power to act without causing inflammation was the property solely of the rays of great penetrating power, composed entirely of hard beta and gamma rays. It has been proved, however, that it is a mistake to suppose that irritation can be prevented with certainty by cutting off the rays of feeble penetrating power, and that such rays have the power to do no more than irritate, or that the rays of great penetrating power act without irritating or causing any inflammatory action. In fact, though it is true that the radiations of great penetrating power, consisting of hard beta and gamma rays as obtained by Drs. Wickham and Degrais when they place metallic screens between the apparatus and the tissues, are suitable to produce modifications in the deeper tissues without causing any irritation of the surface, this result can only be obtained on condition that too strong doses are not used, and on condition that the apparatus is not left applied for too long a time. Irritation of the surface results even with these rays if exaggerated doses are used. On the other hand, rays of feeble and medium penetrating power, if applied in special doses, also produce therapeutic effects without irritation. Thus, for example, in chronic pruriginous skin affections, radiations of weak penetrating power produce an effect, and cures are, in fact, obtained without reaction, by the application of the apparatus bare, without filtering screens, using consequently rays of feeble and medium penetrating

power. It is therefore a mistake to say that some rays produce irritative reaction and that others do not. Burns—radium dermatitis—are not, therefore, dependent on this or that variety of radiations, but on the dosage of the radiations.

The following are a few examples to illustrate what has been said on the subject of the specific action of radium—that is, of its power to cure certain lesions without inflammation. The three examples chosen are taken from three different morbid groups, and each comprises the use of a different variety of rays.

#### I.—*Subcutaneous Cancer.*

This was a case of cancer of rapid evolution in a woman. The tumour, which was of the size of a pigeon's egg, was covered with healthy skin. An apparatus containing 5 cgm. of a radium salt of activity 500,000 was used; it was covered with a sheet of lead 2 mm. thick, ten sheets of paper and a sheet of fine rubber, so that the radio-activity passing through the lead was about 3,000 unities. This apparatus was placed in position on the cancer on alternate nights for twelve hours each time. The application was repeated for fifteen nights, so that in a month it lasted 180 hours. During the two months following the tumour not only stopped growing, but diminished and regressed. At the end of these two months it was only one-sixth of its original size; at no time during the whole period was the skin inflamed.

#### II.—*Angiomatous Tumour.*

A baby showed on the scalp a large angiomatous tumour raised 2 cm. above the surface. Two apparatus were selected, and each enveloped in aluminium, 4 mm. in thickness, six sheets of paper, and thin rubber tissue. Thus covered these apparatus allowed about 20,000 metres to pass, composed of nearly all the medium beta rays, that is, rays of medium penetrating powers. The two appliances were placed on opposite sides of the tumour, facing each other, and applied thus daily for ten days for twenty minutes each day. Three weeks later the tumour had diminished by a quarter, and the treatment was then begun again in the same way. The treatment was thus repeated three times with intervals of three weeks' rest; the cure was completed without any skin irritation at any moment.

#### III.—*Chronic Eczema.*

A man aged 30 had for several years suffered from numerous eczematous outbreaks. Until the attack in question the usual dermatological methods of treatment had brought about a cure, but after the last attack the tissues became lichenoid, thick, infiltrated, inflamed, and very pruriginous. For eight months no treatment produced any alleviation.

A varnished apparatus, 30 cm. square, containing 20 cm. of radium salt, with an activity of 500,000—that is, a fourth part pure radium—was used. This apparatus gave a radio-activity of extreme power; it was applied to the face bare without any filtering screen. It might seem probable that an apparatus of such extreme activity placed on sensitive eczematous tissues would cause very great inflammation. This would have occurred if this power had been badly applied—that is, if the duration of the applications had been too lengthy—but the apparatus was only left in contact for three minutes the first day, three minutes the second day, and three minutes the third day on each of the places affected. They then ceased treatment for eight days; then began again a series of three days with three-minutes' application each day, and a third series after another eight days' rest. Thus, during twenty-five days there were nine applications of three minutes on each place affected; not only was there no increased irritation or inflammation, but from the first week the pruritus stopped. In the second week the infiltration of the inflamed tissues diminished, and about the twentieth day there remained almost nothing of the obstinate inflammation from which the patient had been suffering.

If, *theoretically*, certain tissues which have been mentioned above are cured by "specificity," *practically* it is often expedient, in order to gain time, to act by destruction by giving stronger doses. For even if the nature of a lesion calls for "specificity," this "specificity" is only brought into play with certain doses, and if these doses are increased their destructive is added to their specific action.

## THE MIDWIVES ACT.

### PAYMENT OF MEDICAL MEN.

THE question of the payment of medical men other than Poor Law medical officers called in to attend maternity cases by the midwives has been recently before the Staines Board of Guardians. The attitude adopted by the board in the past has been that the midwives should only call upon the Poor Law medical officers. At the

meeting of the board held on March 16th Dr. W. H. HASKELL moved the following resolution:

That in cases of instrumental and abnormal labour this board, having ascertained on inquiry that the midwife acted in a bona-fide manner in sending for a medical man other than the Poor Law medical officer pay the former a fee not exceeding 1 guinea.

On the suggestion of Mr. GARLAND the words "was justified" were substituted in place of "acted in a bona-fide manner," and with this alteration the motion was carried unanimously.

### TRANSMUTATION OF ELEMENTS.

SIR WILLIAM RAMSAY, in delivering his presidential address before the Chemical Society on March 25th, contended that recent experiments conducted in the laboratories of University College made it at least probable that thorium nitrate engendered carbon dioxide, or in other words, that one of the disintegration products of thorium was carbon. Carbon was also stated to have been produced from zirconium, but not from mercury or lead, and what is even more remarkable, from bismuth.

Sir William Ramsay summarized the various arguments in favour of transmutation. These were, briefly, as follows:

1. The subtraction from or addition to an atom of an element of one or more electrons, by virtue of which it is converted into an ion, completely changes the properties of that element.

2. The fact is incontestably proved that certain elements termed radio-active are losing electrons, and are thereby being converted into other forms of matter, which in our present nomenclature have equal claims to be considered elementary.

3. The influence of ultra-violet light on many, if not all, elements is manifested in causing them to part with electrons; it is not, however, thereby proved that they yield other elementary forms of matter.

4. The effect of chemical change is usually manifested in a gain or loss of energy. There is reason to believe that change from one elemental form of matter into another would be accompanied by an unusually large gain or loss of energy, for it is known that the "degradation" of radium is coincident with the loss of a relatively enormous amount of energy. This energy, moreover, is in a highly concentrated form; much energy is contained in small volume, or, what amounts to the same thing, in small mass, using the word in the sense of quantity of matter.

5. It appears that the irregular regularity of the numbers representing the atomic weights can be represented on the hypothesis that the addition or subtraction of definite groups of electrons is the cause of their divergence from a perfectly regular series.

Sir William Ramsay then discussed briefly the experiments of Mme. Curie and Mlle. Gleditsch and suggested as a possible reason why they had failed to transmute copper to lithium was that the conditions of his experiment had not been exactly observed. It was, of course, also possible that in presence of emanation and a copper solution, a trace of lithium was dissolved from the glass vessel which escaped solution in the absence of emanation. Passing from this point he detailed the results of Mr. Cameron's hitherto unpublished experiments on silver nitrate subjected to the action of radium emanation, and showed the results to be negative, the energy of the emanation having been largely expended in separating and depositing a relatively large quantity of metallic silver. He then described the experiments conducted on thorium nitrate. Successive experiments with this substance, undertaken to test the evolution of helium had failed to settle the question definitely, but 270 grams of acid thorium nitrate were found to produce in 173 days 1.08 c.c.m. of carbon dioxide. On the other hand, 300 grams of mercuric nitrate in a little over seven months produced only 0.015 c.c.m. of carbon dioxide.

On treatment of thorium nitrate with radium emanation carbon dioxide had also been found to be evolved. Zirconium nitrate treated with radium emanation had generated carbon dioxide, and a small quantity of the gas had also been obtained from hydro-silico-fluoric acid;

the treatment of lead nitrate with emanation had given a negative result.

A still more interesting apparent transformation was that obtained on treating bismuth perchlorate with emanation. Despite the fact that bismuth belonged to the nitrogen group, carbon dioxide had been generated in very appreciable quantity, but no nitrogen.

Sir William Ramsay described some of the precautions taken to ensure accuracy, and it may be mentioned here that the possibility of the carbon dioxide being produced from grease on the stopcocks of the apparatus was disproved; further, that special precautions were taken to exclude the presence of even traces of air. Sir William Ramsay concluded as follows:

"Such are the facts. No one is better aware than I how insufficient the proof is. Many other experiments must be made before it can be confidently asserted that certain elements, when exposed to 'concentrated energy,' undergo degradation into carbon."

### LITERARY NOTES.

THE forthcoming double section of the Oxford English Dictionary, which is by Dr. Craigie, contains the words from Ribaldric to Romanite, 3,161 in number. Of these words, 2,747 are illustrated by quotations, and altogether no fewer than 17,677 quotations are given. Comparison shows that the largest number of words recorded in any other dictionary which is at all comparable is 1,366, and of quotations 1,664. Some of the more interesting words are rick, rickets, rifle, rigmarole, roam, roar, Robin Hood, rhodomontade, and rogue. This instalment will be followed by a portion of S by Dr. Bradley.

In *Chambers's Journal* of March 1st Mr. A. Stodart Walker continues an interesting series of articles entitled "Some Celebrities I Have Known." The present list includes Huxley and William Rutherford, the physiologist. Of the former he says that on hearing Robert Louis Stevenson's depreciatory estimate of the Edinburgh climate he said: "I quite agree with him. I now understand why Edinburgh people are so strong; your *summer* kills off all the weak ones." Rutherford, whose assistant Mr. Stodart Walker was, he describes as "genial if eccentric." We have no wish to revive the echoes of

Old, unhappy, far off things,  
And battles long ago,

but we may be allowed to say that Mr. Stodart Walker seems to have been more fortunate in his personal relations to Rutherford than some other assistants of the distinguished teacher. The stories told of him are mostly "chestnuts" in more or less inept metamorphoses. But the stories told of his encounters with noisy students show that in that rough form of controversy Rutherford was quite able to hold his own.

In the *JOURNAL* of March 6th a summary of observations made by Dr. Elmer E. Jones on himself as to the waning of consciousness under chloroform was given. The following account (which we take from the *Guy's Hospital Gazette*) of the experience of a small boy while under the influence of gas in the dentist's chair may be interesting:

The sensation is very queer, but it is soon over. You dream very many things, and very funny things. I will just give a few facts of my dreams. At first I felt as if I were sinking down in the earth; then I found myself in a cave with 1,000's of little beings generally known as demons, which were very fat. Then one demon eat another, and that one another, and another one eat that one, and so on until only a few very fat ones were left. These turned very thin and very tall until they turned into strings, and then (somehow or other, a way which I can't remember) they multiplied until there were 1,000's of strings (very long). Then my head, which jumped off my shoulders, jumped on top of them, and then snakes appeared and hooked on to each other, and formed (altogether) a sort of large tassel. Then the tassel got smaller and came to a tassel of a railway carriage blind, and all of a sudden I was in a railway carriage. This, however, woke me up, and I was in the dentist's chair with the tooth extracted.

In a recent number of *Public Opinion*, which, by the way, gives week by week in a condensed form the cream of the best that is said by leaders of opinion of all shades throughout the world, there is the following story:

"Mr. President," said a United States Senator, speaking in the House, "I am confident that before our financial physicians