

SCIENCE NEWS

Science Service, Washington, D. C.

MASURIUM AND RHENIUM

USE of spectra obtained by passing a beam of X-rays through concentrated solutions of rare minerals has enabled Dr. Walter Noddack, of the University of Berlin, assisted by Otto Berg and Ida Tacke, to discover the missing chemical elements, numbers 43 and 75, in the group with manganese in the periodic table. Traces of them have been detected in the concentrated solutions of platinum ores and of the minerals gadolinite and columbite, and it is estimated that they form a billionth of the earth's crust. Dr. Noddack has named them masurium and rhenium after the territories lost by Germany as a result of the peace treaty, the Masurian region of East Prussia on the east and the Rhine provinces on the west.

The new elements, masurium and rhenium, discovered by Dr. Walter Noddack, in Berlin, were brought to light as a result of a law discovered by Henry G. J. Moseley, a young British scientist who lost his life in Gallipoli during the war. When a beam of X-rays is reflected by a crystal or powdered crystals it is spread out into a band, after the manner of a beam of light passing through a glass prism. If this band is allowed to fall on a photographic plate, a series of light and dark lines is obtained, which is called the X-ray spectrum. The X-rays have very short wave lengths and therefore come at the extreme end of the spectrum, beyond the ultra-violet waves.

After a study of the X-ray spectra of many elements, Moseley formulated a law which now bears his name, by means of which, if the atomic number of an element, or its position in the periodic table, is known, the character of its X-ray spectrum may be obtained. A few vacancies still exist in the 92 spaces of the table, but the characteristic spectra of the unknown elements can be calculated in advance, and when a substance is found to give this spectrum, there is no doubt of its identity.

Similar methods were used in 1922 by G. Hevesy and D. Coster at the Institute for Theoretical Physics at Copenhagen, to discover the missing element number 72, which was named Hafnium, after the Latin name for Copenhagen.

With the discovery of the new elements, there are only three vacant places left in the periodic system, which have the numbers 61, 85 and 87. These, like masurium and rhenium, which are numbers 43 and 75, are odd numbers, as it is a curious fact, pointed out by Professor Harkins, of the University of Chicago, that in the case of elements of high atomic weights, those of even number are more common.

Noddack was trained under Nernst, the famous physical chemist of the University of Berlin.

CRYSTALS OF VITAMIN

VITAMIN "C," the preventive of scurvy, has been obtained for the first time concentrated into crystalline form, by N. Bezssonoff, a biochemist. M. Bezssonoff ob-

tained his product by the concentration of a large quantity of the juice of cabbages, which vegetables have long been recognized as effective in the prevention of scurvy. After the final treatment he had a quantity of colorless, needle-shaped crystals that had the same effect in the prevention and cure of the disease as is shown by fresh fruits and vegetables, even when given in the minutest amounts. Scurvy could be prevented in rats, his test animals, by daily doses as small as two milligrams, or less than one one-hundred-thousandth of an ounce. Chemical analysis of the crystals showed them to belong to the hydrocarbon group of organic substances; the compound has been given the technical name of "phenolic anthracene quinone."

Scurvy, the disease for which vitamin "C" is the preventive, used to be a terrible scourge in the old days of sailing ships, when men went on long voyages without adequate supplies of fresh vegetables. It manifested itself in general weakness and debility, distressing skin troubles and the loosening and dropping out of the teeth. Its cure was discovered before its cause was discovered, simply because its cause consisted only in the absence of its cure. Its cause, as is now well known, is the absence of a certain definite food factor, called vitamin "C," and the supplying of vegetables and fruits that contain the vitamin prevents its development and also stops it where it has started. The isolation of this vitamin in pure form as crystals in M. Bezssonoff's contribution to the triumph of science over this disease.

VEGETABLE DIET AND THE LENGTH OF LIFE

THE vegetarians' idea that meat eaters are destined for an early grave receives little support from conclusions of Professor James R. Slonaker, Stanford University physiologist. After experimenting with rats for eight years, Professor Slonaker applies his findings to humans and declares that meat is essential if the human race is to continue.

White rats, under Professor Slonaker's care, reacted very definitely to vegetable and protein diets. The restricted, or vegetable, diet, caused a shortening of the span of life—33 per cent. in the males, and 40 per cent. in the females. Soon after meat was withdrawn from their diet, males lost 35 per cent. of their weight, females from 25 to 28 per cent. By the third generation, power of reproduction was wholly lost in the non-meat-eaters.

"This indicates," said Professor Slonaker, "that there is something lacking in vegetable food which is furnished by the supplementary animal protein. This may be due to additional protein in a form more readily utilized by the animal, or the particular protein may act as a stimulus, causing all cells of the body to become more active and thus making possible a greater and more complete use of the vegetable foods consumed."

Science

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Science **61** (1591), x.
DOI: 10.1126/science.61.1591.x-s

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