

CHEMISTRY

# Unlimited Alchemy Foreseen In Understanding of Isotopes

## Ability of Science to Create "Any Element Whatever, Wherever and Whenever it Pleases" Forecast in England

SCIENTISTS will some day create in the laboratory "any element whatever, wherever and whenever we please." This was forecast by Prof. F. W. Aston of Trinity College, Cambridge University, before the meeting of the British Association for the Advancement of Science.

Prof. Aston, as president of the section on mathematics and the physical sciences, spoke on "The Story of Isotopes."

Isotopes, the forms of an element which have slightly different atomic weights but similar chemical properties, are inseparably bound up with the new field of artificial radioactivity and transmutation of the elements, Prof. Aston pointed out.

Predicting synthesis of all elements "at a time not immeasurably far distant," the British scientist told his colleagues that they will then make possible "alchemy indeed in the service of man."

Illustrating what discoveries in isotopes may mean, Prof. Aston described how the puzzling atomic weight of the gas neon at 20.2 was cleared up.

It was found that there were really two types of neon in the chemical samples used in determining its atomic weight. One kind of neon had a weight of 20; the other of 22. The previously observed weight of 20.2 was the result of these two kinds being present in the ratio of 9 to 1.

Similarly, bromine, whose atomic weight was almost exactly 80, was found to consist of almost identically equal proportions of two isotopes weighing 79 and 81. Krypton, rare gaseous element in the atmosphere, was found to consist of six isotopes; xenon and tin have even more.

### Study Almost Complete

The study of isotopes by methods using the mass-spectrograph — often called an atomic scale because it determines the relative weights—is almost complete, Prof. Aston said. At least, he added, in so far as the isotopic identification is concerned.

Up to 1934 only four elements—gold,

platinum, iridium and palladium—had withstood the efforts of scientists to dis-close isotopes for them.

Just this spring, at the meeting of the American Philosophical Society in Philadelphia, Prof. A. J. Dempster, University of Chicago physicist, announced the discovery of one isotope for gold.

Still more recently Prof. Dempster in a private communication to him told of finding five isotopes for platinum, Prof. Aston said.

The field of isotopes, the British scientist declared, is now being pushed to new degrees of accuracy in determining atomic weights.

Where instruments can now detect one part in 10,000, the demands of the new nuclear physics require accuracy of one part in 100,000. The battle of the "next decimal place" thus goes on.

Out of it all, Prof. Aston declared, will come the work to fulfill his prediction that scientists will some day realize the dream of the alchemists.

The practical implications of such success need no detailed amplification to emphasize their importance.

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ELECTRICITY

## Human Fireflies Flit Through Malayan Woods

MALAYA, in the Straits Settlements, as a country of human fireflies is the picture a newcomer to the region sees first, reports U. S. Trade Commissioner Julian B. Foster of Singapore to the Bureau of Foreign and Domestic Commerce in Washington.

Malayan natives, it seems, are taking up the use of electric flashlights in ever increasing quantities.

Pointing out that of a total population of 4,500,000 people only 850,000 live in the cities of Singapore, Penang, Kuala Lumpur and Ipoh, Commissioner Foster goes on to state, "The remainder of the inhabitants live either in very small towns or hamlets where electric lighting facilities are poor, or else in the country itself

where no electric lighting is available. One of the most striking things noticeable to a newcomer to Malaya is the display of hundreds of torch lights that are in evidence in all parts of the country districts after dark."

What nations make the flashlights and the bulbs and batteries that go in? That is the interest of Commissioner Foster and the electrical industry of the United States.

In the field of flash and torch bulbs Japan leads the race. In 1934, when the imports of bulbs increased nearly five times, Japan secured nearly 72 per cent. of the total trade.

No figures for the average price of these flash bulbs is given, but a fair comparison would be to take the cost of automobile headlight bulbs. Such bulbs are landed in Singapore at price averaging 3.5 cents each for the Japanese product. British bulbs averaged 22 cents apiece and the American 13 cents. The prices given are in Straits Settlement currency.

Although the trade generally agrees that the Japanese bulbs are distinctly inferior to the British or American product, the competitors of Japan cannot begin to touch them on the question of price.

In the field of flashlight batteries, however, the United States is supreme.

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ASTRONOMY

## Nova Flareups May Occur In Life of Every Star

STAR eruptions such as the one which produced the striking Christmas star of 1934, Nova Herculis, probably occur at some time or other in the life of every star in the universe, Dr. H. Spencer-Jones, director of Greenwich Observatory, told the meeting of the British Association for the Advancement of Science at Norwich.

Somewhere in the galactic system containing the earth and sun there are probably thirty such flareups annually. At this rate it would take some 3,000 million years, the Greenwich astronomer estimated, for all the stars in the galaxy to undergo the flaring nova phenomenon.

The theory of Prof. E. A. Milne, Oxford University mathematician, provides a reasonable explanation for the enormous outpouring of energy during the flareups of nova type stars, Dr. Spencer-Jones pointed out. According to Milne's theory the outburst comes from the release of gravitational energy as the star goes from one state of internal equilibrium to another. Such instabilities are known to occur during the evolution of a star.

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