

NUCLEAR PHYSICS-AAAS

Predict Heavier Elements

Numbers 97 and 98, undiscovered as yet, pose a major difficulty in finding the necessary starting materials. May have masses as high as 247 and 248.

► THE synthetic manufacture and identification of chemical elements heavier than curium, number 96, at present tops in atomic number and weight, will be possible, Dr. Glenn T. Seaborg of the University of California predicted in the Sigma XI lecture before the American Association for the Advancement of Science in Chicago.

The major difficulty in making new undiscovered elements 97 and 98 will be finding the necessary starting materials, he told the scientists. From their knowledge of how these heaviest elements are built up, the chemists can predict that the most stable and the longest-lived varieties or isotopes of elements 97 and 98 will have masses as high as 247 and 248 and higher.

Curium's heaviest isotope is only 242 and from it upward is quite a jump.

However, Dr. Seaborg has some good guesses about the chemical properties of such new elements, and he intends to use this information in attempting to create the new elements in the future.

Co-discoverer of atomic bomb element, plutonium, 94, as well as americium, 95, and curium, 96, Dr. Seaborg explained that of the 96 known elements, 94 have been isolated in quantities sufficiently large to see and weigh them. Astatine 85 and francium 87 may never be separated out in such quantities and in Dr. Seaborg's opinion may remain unique in being the rarest of chemical elements.

Eight chemical elements, four of them beyond uranium 92, and four filling gaps in the periodic table, at 43, 61, 85 and 87, have been discovered within the past ten years.

The metals gold, silver, copper, iron, lead, tin, mercury and also possibly zinc, as well as the non-metals, sulfur and carbon, were all known and written about some 2,000 years ago. A number of these were known 5,000 years ago and some probably were recognized and used in prehistoric times, Dr. Seaborg declared. The alchemists identified the substances arsenic, antimony and bismuth during the period from the twelfth through the sixteenth centuries. Platinum was probably the "white gold" of that period.

The first individual identified as a chemical element discoverer was a German merchant, Hennig Brandt, who first brought to light the element phosphorus in 1669. A dozen elements were discovered in the eighteenth century, while most of the remaining elements, about 60 in

all, were discovered in the nineteenth century.

The atomic weights of the elements are based upon the lightest of them, hydrogen, taken as one, and until the discovery of the four trans-uranium elements, uranium was the heaviest, with a variety or isotope 238 times the weight of hydrogen as the most prevalent natural form of this relatively rare element. The elements were also arranged in order by atomic numbers, from hydrogen 1 to uranium 92 by H. G. J. Moseley, killed in the first World War, and this is now extended to curium 96.

Science News Letter, January 3, 1948

ENGINEERING

Barge Climbs Banks

► THE latest thing in a seaboat that will travel on land is a new Navy amphibious vessel. It is called a "walking" barge, and it can navigate through surf, soft mud, sand and quagmires as well as sail the ocean or climb embankments.

It is dubbed a walking barge because of its method of travel when out of sailing water. It consists of three lengthwise pontoons placed side by side. The

center pontoon can be raised 17 inches, moved forward ten feet, and lowered. Then the two side pontoons step forward in a similar way, and do so at the same time.

The vehicle can carry 60 tons of men and cargo. Each of the outer pontoons is 60 feet long, six feet wide, and slightly more than nine feet high. The center pontoon is 44 feet long, 16 feet wide



WATER-LAND BARGE—This is a model of a "walking" barge which can haul 60 tons of men and materials across mud, sand and surf; it is propeller driven in the water and is completely amphibious.