

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

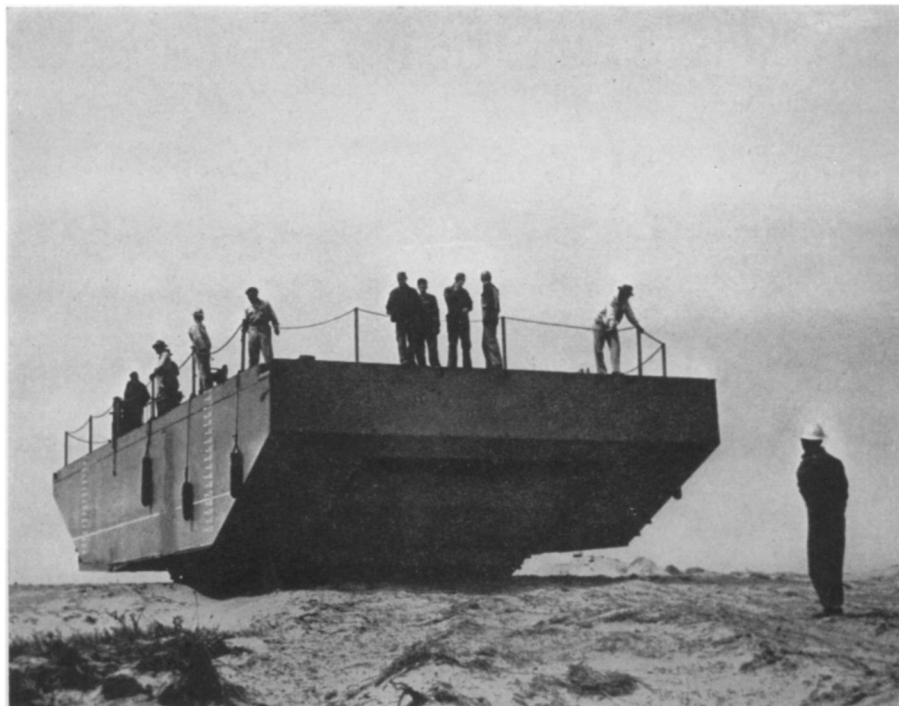
Barge Climbs Banks

► 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.

and six feet high. The entire barge is of all-welded construction, and all three pontoons are divided into watertight compartments.

The craft has now successfully passed initial tests. These included climbing steep embankments in addition to travel in mud, sand and surf. Traction in mud

flats is obtained through vertical fins installed in the bow of the inner pontoon and in forward sections of the others. They are automatically raised into the hull as the barge makes a forward step and lowered into the mud when it touches.

Science News Letter, January 3, 1948

PSYCHOLOGY-AAAS

Stress May Be Ulcer Clue

➤ MEN are more likely to have stomach ulcers because women, although they react more to stress, relax more rapidly and recover more quickly.

The answer to sex differences in ulcers is explained by the way boys and girls react to stress, Dr. L. W. Sontag, of the Fels Research Institute, Yellow Springs, reported.

Dr. Sontag found that girls react more to stress, but that they also relax and recover more effectively than boys. The experiments included plunging a child's hand or foot into cold water for a minute, or tilting the person tested head down at a 45-degree angle for two and a half minutes, and then measuring changes in heart rate, blood pressure,

electrical resistance of the skin, and other physical clues to emotion.

Although the shock of cold water or turning upside down is purely physical, Dr. Sontag explained that it produces almost exactly the same kind of physiological changes as do shocks of a mental or emotional nature.

Dr. Sontag's findings fit in with facts discovered earlier in collaboration with Dr. Hudson Jost. Cousins were found to be much more alike in reaction to stress than unrelated children. Brothers or sisters are more alike than cousins, and identical twins are even more alike.

All this suggests to Dr. Sontag that the way a person behaves under stress is in part due to his inheritance.

Science News Letter, January 3, 1948

ETHNOLOGY-AAAS

Baby Care Just Average

➤ AMERICAN infants get just about average treatment compared with babies in other parts of the world, Dr. John W. M. Whiting, of the State University of Iowa, is convinced.

How mothers of 85 different peoples, including the U. S. A., feed their babies and wean them, teach them manners in regard to toilet habits, give sex instruction or prohibitions, train them to be independent and to control aggression, was studied by Dr. Whiting in collaboration with Dr. Irvin L. Child, of Yale University. The American study was conducted on "middle-class" mothers.

American mothers, they found, seem to be in a big hurry to start training their babies. American babies are weaned earlier and must get their toilet training and sex training way ahead of most other children.

But the American mother does not hold the record for nonindulgence in nursing her baby. That goes to a Polynesian tribe, the Marquessans, where the mothers believe that nursing the baby

will spoil their beauty. Feeding times have nothing to do with the protests of the child. Only in this tribe, among the Maori, and in the American middle class, is the baby weaned before he is a year old. Two societies do not wean their youngest children at all, but the average is two and a half years.

Babies are trained in modesty all over the world, even where adults do not wear clothes. The Kwoma of New Guinea, for example, teach girls to sit modestly and boys not to stare at girls or women. Americans have a just average rating in modesty.

In this tribe, the lucky babies receive the most indulgent care from their mothers. The tribe is polygynous, and when the baby is born the mother is excused from all household and gardening cares, and devotes herself entirely to the baby until the child is weaned. During this time, the co-wife must do all the other work.

In punishment for aggression, again the American middle-class stands on

middle ground. Among two peoples, the Lepcha and Hopi, aggression is discouraged completely and consistently from birth. The Kwoma, on the other hand, give specific encouragement and training in aggression during childhood. Ratings were made separately for physical aggression, verbal aggression, property destruction and wilful disobedience. Property destruction is punished most severely, wilful disobedience next. Least severely punished form of aggression is physical aggression.

With regard to severity, the American mother takes her place at the most harsh end of the scale with regard to sex and toilet training. She is most indulgent in training for independence. She is just average in weaning her baby and in teaching him to control his aggressiveness.

Science News Letter, January 3, 1948

SCIENCE NEWS LETTER

Vol. 53 JANUARY 3, 1948 No. 1

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

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Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C. Pennsylvania 6-5566, and 360 N. Michigan Ave., Chicago, STate 4439.

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