

CHEMISTRY

New Plastics Coming

New plastics will not be limited to carbon compounds and silicones but will be made from everything from phosphorus to arsenic.

► THE PLASTICS which make so many new materials are by no means limited to the usual carbon compounds and the new silicones in the chemists' bag of tricks.

Possibility of whole new series of them, built of everything from phosphorus to arsenic, appeared in a paper given in Chicago before the American Chemical Society by Dr. Anton B. Burg of the University of Southern California at Los Angeles. Dr. Burg reported work carried on in association with Drs. J. C. Taylor, D. K. Robinson, C. L. Randolph Jr., R. I. Wagner and F. G. A. Stone of the same institution.

Possibility of making compounds between phosphorus and nitrogen, phosphorus and arsenic, arsenic and boron, and phosphorus and boron are being studied by the group, and the resulting plastic-type materials tested for stability and chemical inertness.

Dr. Malcolm E. Kenney described similar attempts made with Dr. A. W. Laubengayer at Cornell University to produce plastic materials by combining carbon compounds with the little-known metal gallium. Such compounds might be expected to be similar to those made with boron.

Elements Predicted

Experience with the newest man-made elements leads their discoverer, Dr. Glenn T. Seaborg of the University of California, to predict with greater certainty the chemical properties of eight elements which do not exist today and may never have existed on earth. If they are made at any time in the future, either in the giant cyclotrons of the University of California under Dr. Seaborg's direction, or elsewhere, they will conform to the pattern displayed by the sequence of 98 elements already known, according to Dr. Seaborg's prediction.

Element No. 104 will accordingly be similar in properties to zirconium and hafnium, now in demand as materials for building atomic reactors. Elements 99 to 103 will complete the list of actinide elements, which correspond to the lanthanide, or "rare earth" elements which appear among the fission products of uranium. Uncertainty about this correspondence was expressed by some chemists when the man-made elements first appeared on earth, as a result of neutron bombardment of uranium in atomic piles. Dr. Seaborg now believes that apparent irregularities in the properties of thorium, uranium and the first of the "artificial" elements are understood and that the places of the new elements are well established.

Complex Sugars Made First

Green leaves seize upon the carbon in the carbon dioxide they absorb from the air and build it into a complex acid composed of phosphorus and glycerine, which is then torn down to make sugar.

This round-about way of building plant nutrients was explained by Drs. James A. Bassham and M. Calvin of the University of California.

Working with radioactive carbon 14, these scientists have made a time chart showing the successive combinations formed as the radioactive material travels through the life processes of the plant. Ordinary sugars which are commonly obtained from plants and fruits are shown by these studies to be late steps in the plant's photosynthesis, while unusual sugars of greater complexity are formed first.

This is the opposite of the way chemists had imagined the build-up of sugar in plants. They had supposed that nature would start with some simple compound and build toward the more complex ones.

Molds Make Alcohol

New kinds of fermentation have been discovered in which pentose, a simpler kind

of sugar than the one met on the dinner table, is changed to alcohol by molds instead of yeasts. Studies of fermentation by various kinds of molds and bacteria were reported by Dr. Martin Gibbs of the department of biology at Brookhaven National Laboratory. Radioactive carbon was used to determine the formation of fermentation products.

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PHYSIOLOGY

Primitive Animals Have Red-Blood Material

► RED BLOOD material has been discovered in very primitive animals, protozoa.

Hemoglobin may be much more widely distributed in this large phyla division of the animal kingdom, Drs. D. Keilin and J. F. Ryley of Cambridge University's Molteno Institute suggest in a report to the British scientific journal, *Nature* (Sept. 5).

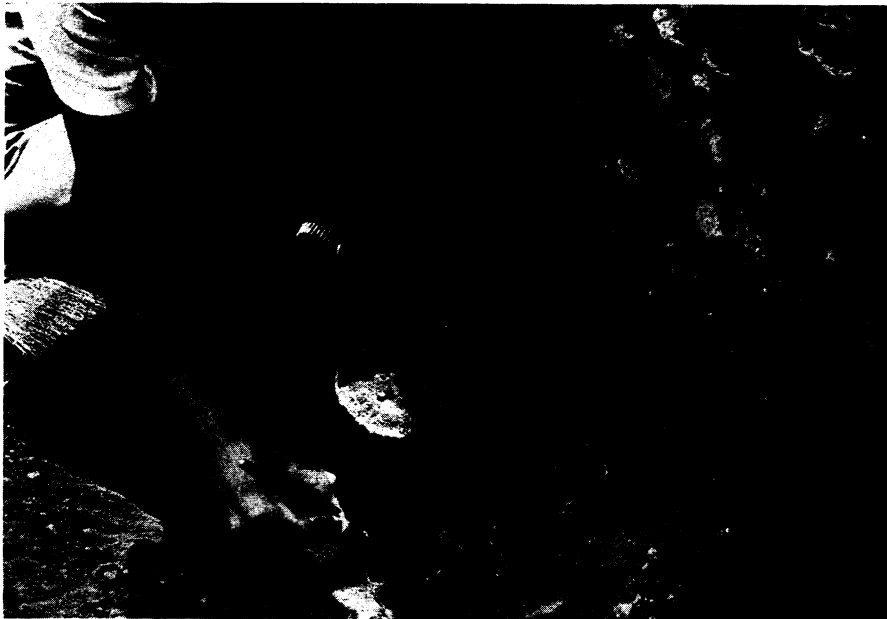
They proved spectroscopically that this iron-containing constituent so important in human blood exists in small quantities in *Tetrahymena pyriformis*. In 1937 two Japanese scientists, T. Sato and H. Tamiya found it in *Paramecium caudatum*.

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ARCHAEOLOGY

Soup Was on a Thousand Years Ago in New Mexico

► SOUP WAS on some thousands of years ago in what is now New Mexico. The stone bowl and remains of the fire on which it came to a boil have now been found by



SOUP WAS ON—Some thousands of years ago, prehistoric Indians cooked dinner in this pot. Here are shown archaeologists carefully digging out the pot and remains of the fire on which it came to a boil so long ago.