

Chemists Given Theory of Origin of Life

Following are reports by Dr. Edwin E. Slosson of some of the high-lights of the meeting of the American Chemical Society at Richmond, April 11 to 15. These supplement the reports in the News-Letter for April 16, on page 239.

A chemical theory of the origin of species was presented to the American Chemical Society in a paper prepared by Dr. Victor C. Vaughan, former head of the Medical School of the University of Michigan and foremost authority on epidemics. He goes far back beyond Darwin, to a period long before the appearance of the earliest and simplest single celled plant or animal, which is the point where the biologist begins. For he believes that life is molecular and not cellular. The microscope shows us that cells constitute the structural units of all plants and animals but Dr. Vaughan thinks that the size and shape of these little bags of protoplasm are less important than the composition of their contents. The essential and probably the primary compound of all living matter is protein, which consists of very complex molecules, containing various ammonia, acid and sugar groups.

Dr. Vaughan admits that "up to the present time no chemist has awakened dead matter into life. It may be that this will never be done," but that should not discourage future experimentation in this line. Every element that is found in living matter exists in the mineral kingdom, and the chemist has learned that he can now make, out of the inorganic material of earth and air, many organic compounds formerly found only in plants and animals. As this gap between the inorganic and organic is being gradually filled in by modern research, so also is the gap between chemical molecules and living creatures. As he says, "Nearly twenty years ago I first stated my belief that life is fundamentally chemical and may, indeed probably does, exist in simpler and less tangible forms than any living cell, or even the living bacterium." This opinion has since been confirmed by the discovery of minuter forms that prey upon the bacteria as the bacteria prey upon us, and by the study of the viruses of plant diseases, which are composed of particles so small as to pass through a porcelain filter, yet grow and multiply like living creatures.

The proteins are very changeable compounds and can be easily altered by disease or chemical action. For instance, an attack of measles in

childhood may make a man immune to the infection for life. A minute amount of a foreign protein, even from a wholesome food like eggs or milk, when injected into the blood renders this article of diet permanently poisonous to that particular person.

The importance of this paper extends beyond the sphere of chemistry into the domain of sociology and ethics. For if Dr. Vaughan's views are confirmed they must radically change current teaching as to the relative importance of heredity and environment.

"I hold that the lowest forms of life have come into existence through chemical agencies," Dr. Vaughan concluded, "And that environment has been a stronger factor in the evolution of life and in the development of the varieties and species than is believed by the biologist of today. All life is protein and the development of new species is due to molecular rearrangement in the structure of the protein molecule. Where a protein has at last been evolved which best fits the functional needs and where its environment remains little changed, its chemical constitution will remain remarkably constant."

Live Wires in Silk

Live wires, attired in ribbons of synthetic silk, were introduced to the chemists by Dr. W. O. Mitscherling, of Bridgeport, Conn. Viscose made from wood pulp is pulled out into a ribbon and after purification is wrapped around the wire while still wet. There it sticks tight and shrinks, making a very close fit, and serving as an excellent insulator. The coating can be made quite transparent, and in this form it is of especial value in constructing radio sets, for the whole wiring and soldering job can be inspected for breaks and other troubles without unwrapping or scraping anything.

A metal that takes fire when breathed upon was one of the novelties exhibited. It is barium, an element more or less similar to calcium, not uncommon in minerals but now for the first time obtained in pure form and large yield by a process discovered by Prof. R. A. Baker and A. J. King, of Syracuse University. They distil off the metal in a vacuum from a mixture of aluminum and barium oxide and get

barium 99.95 per cent pure. It is a soft and shining metal, somewhat resembling sodium. It is an extremely active and avaricious element, attacking with violence almost every substance brought into contact with it. Moist air sets it aflame. It can only be handled in glass tubes filled with argon, a gas so inert that it unites with nothing. On account of the avidity of barium for the gases of the air it may be useful in removing the last traces of air from vacuum tubes made for electric lamps and radio receivers.

Classifies Smells

We may some day be able to recognize passing smells as we can now recognize passing autos, by reading off their numbers. E. C. Crocker and L. F. Henderson, of Cambridge, Mass., have worked out a system of tagging odors. They recognize four basic types of smell-perception: "sweet," "acid," "burnt," and "caprylic." Almost no scents belong wholly to any one of these classes, and most of them include all four in varying degrees. With a series of numbers from 0 to 9 to represent intensities, the investigators are able to designate every scent. The ordinal position of the digit indicates its class. Thus rose perfume smells like 6423; sweetness, its predominant characteristic, being represented by 6. Vinegar smells like 3803, the 8 indicating the strong acid smell and the 0 the absence of any burnt odor. But "burnt" is the strongest thing about freshly roasted coffee, which, however, also has a good deal of both "sweet" and "acid," and hence gets the number 7683. Perhaps the belles of the future will have perfumes compounded to match their car numbers, or co-eds will scent their compacts with the signal for a forward pass.

Seeing the Invisible

The vision of the chemists of the American Society was carried to the verge of the invisible and beyond by the demonstration of the ultra-microscope by F. F. Lucas of the Bell Telephone Laboratories. Pictures of thin sections of alloys thrown upon the screen showed the details of the various constituents and disclosed the causes of the strength or weakness of the metal.

(Just turn the page)

The ROMANCE of CHEMISTRY

By William Foster, A. A. S., of Princeton

A NEW AND complete and delightfully written story of modern chemistry. A practical book for housewife and manufacturer, farmer and physician. A stimulating book for the general reader of cultural inclinations. Dr. Foster has succeeded amazingly in linking this most practical of sciences with the ordinary life of the world. His anecdotal, pictorial style of writing brings Drama out of Science.

A handsome octavo, bound in orange cloth, 468 pages, profusely illustrated, index and reading references. \$3.00

You can get this book from any bookseller or from

THE CENTURY CO.

Publishers of Enduring Books

The Century Co., 353 Fourth Ave., New York City

Kindly send me immediately, postage paid, Dr. William Foster's

THE ROMANCE OF CHEMISTRY

I enclose \$

or

Send C. O. D.

Name

Address

Town

Chemical Meeting

(Continued from page 257)

An incipient crack started in the edge of a strip of nearly pure iron by thousands of bendings was seen to have followed the line of the scattered inclusions of non-metallic material. By means of this instrument it is possible to make visible a particle of only one-five-millionth of an inch across, and by the use of the shorter waves of ultra-violet light the magnification and definition can be carried considerably further. Photographed in the dark, the particles so made perceptible are composed of only about five hundred atoms; so the microscopist must have nearly reached the chemist's limit of divisibility.

But the speaker who followed, Prof. Victor Henri of the University of Zurich, went beyond this point, and by the employment of X-rays and analytical mathematics, he demonstrated the arrangement in space of the five atoms forming the fundamental compound of carbon, methane. It has hitherto been surmised that the carbon atom occupied a position in the center, with the four hydrogen atoms around it at equal distances, but according to the new theory the shape of the molecule is a pyramid instead of a tetrahedron. The determination of the structure of the carbon atom is of primary importance, since all living matter, plant and animal, is composed of carbon compounds.

Say you saw it advertised in the SCIENCE NEWS-LETTER

Longer Life With Vitamins

How to double the length of life, maintain health, increase the birth-rate, and postpone senility by a properly balanced diet was demonstrated by Prof. H. C. Sherman of Columbia University. It is disappointing to find that he is talking about rats, but we must remember that experiments on rats often lead nowadays to knowledge of diet and drugs which is applicable to man. In fact, Prof. Sherman himself says:

"There is no reason to doubt and ample reason to believe that similar improvement in nutrition with resulting increase of vitality and higher degree of health with longer life and especially a longer duration of the prime of life, can be realized in human experience by a like improvement of the food even though the original food supply is already adequate according to current standards."

On lantern slides he showed the photographs of twin brothers or sisters at an age which in the rat family corresponds to eighty in the human family. One rat was perky, sleek, upstanding and bright-eyed. The other was dull and doddering, with hanging head and falling fur. The secret of the difference lay in the proportion of vitamins and minerals in their diet. The first rat, for instance, had been fed on a mixture of one-third dried whole milk and two-thirds whole wheat, and the second rat on one-sixth milk and five-sixths wheat. The former had a liberal supply of vitamin A and lime; the latter had merely an adequate amount.

Germans Reinstated

The chemists remembered the decennial of American participation in the world war in their own way, by restoring to honorary membership Dr. Wilhelm Ostwald and Dr. Walter Nernst, famous German chemists who had been dropped from the rolls during the war. Many of the American chemists who then voted to expel their German colleagues were foremost in advocating their restoration to membership. Honorary membership was also voted to another German, Dr. R. Willstaetter, one of the world's most eminent authorities on organic chemistry.

Science News-Letter, April 23, 1927

There are almost 3,500 languages and dialects in the world, of which more than half are in America.