SCIENCE NEWS

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UNITY OF SUBJECT-MATTER OF PHYSICS AND CHEMISTRY

DR. J. C. SLATER, professor of physics at Massachusetts Institute of Technology, speaking at Williams College's Mark Hopkins Centenary Celebration, pointed out that after a century of separation the important sciences of chemistry and physics are once more attaining unity of subject-matter, experimental methods and thought.

Mark Hopkins, fourth and most famous president of Williams College from 1836 to 1872, died in 1887.

A hundred years ago scientific men like Davy and Faraday worked interchangeably in the field of physics and chemistry and called themselves natural philosophers. But in the intervening ten decades the two sciences became separated in thinking, techniques and methods. Now, however, physics is coming to the aid of chemistry to provide more powerful ways of observing matter and in interpreting the structure of matter in terms of the basic laws of nature. Professor Slater added that while the ingenious physical ways of learning chemical secrets of matter are perhaps the more spectacular and the most fruitful in immediate results, it very probably will be the theoretical understanding of the structure of matter that will be the most important.

"The impact of the new physical theory on chemistry," he said, "must lead to a firm set of foundations for a natural philosophy of the future, a philosophy starting from first principles, leading to the explanation of the whole of material nature. Now more than at any past time this seems not like a fanciful hope, but like a quite practicable program, which will surely be carried out in the course of time, if physicists have the perseverance and the opportunity for it. Let us hope that if another celebration similar to this is held a hundred years from now, the theory of the structure of molecules and solids will be a subject completely understood, and that science will have moved on to other fields, probably in the understanding of living matter. For this to happen, physicists must have perseverance; for it is a hard task, and physicists have a way of running to the new and exciting rather than to the solid and rewarding problem. And they must have opportunity to work, unhampered by popular prejudice against science or by lack of support. We can not be sure that they will have these necessary things. But let us greatly hope for it and work for it, for the problems I have spoken of are in the main line of scientific progress, and in one of the main lines of progress of human thought."

DIET IN DIABETES

STARVATION diets in diabetes, which once were an important subject for discussion at meetings of the American Dietetic Association, are now gone and almost forgotten, members of the association happily realized as they listened at their meeting recently to Dr. Elliot P. Joslin of Boston. Dr. Joslin described the modern methods of treating the disease with insulin and the newer protamine insulin which has a more lasting effect than insulin itself.

Full trays are now in order for diabetics, although weighing and measuring must still go on. Insulin controls the disease, allowing the patients to eat heartily by comparison with the old days. Carbohydrates, the sugar and starch foods, are no longer forbidden or reduced to a minimum.

The modern diet in diabetes strikes a fine balance between the patient's disordered sugar-regulating mechanism, his insulin dosage and the fats and carbohydrates in his food. Devising palatable food combinations that meet the requirements of each diabetic patient are only part of the dietitian's job. Education of the patient is another important part and education is also an important feature of the patient's treatment at Dr. Joslin's clinic.

After his diet and insulin requirements have been determined, the patient is taught how to live with his disease and keep it controlled with the aid of periodic check-ups with his physician. In this way, even small children learn to give themselves insulin, to weigh or measure their food for each meal and to select the proper foods for themselves from the family menus. Other non-dietetic measures, such as prevention of infections and fatigue, are also taught.

DIET IN ANEMIA PREVENTION

DR. GEORGE R. MINOT, of the Boston City Hospital, speaking before nutrition experts at the meeting of the American Dietetic Association, in Boston, emphasized the fact that a good diet throughout life will aid in prevention of anemia.

Young maidens who "foolishly feed upon trash" were recognized as particular victims of this weakening malady back in the mid-seventeenth century, Dr. Minot pointed out, but it is only within a few years that medical science has gained a clear recognition of the importance of nutrition in warding off this disease.

Dr. Minot, who shared in the Nobel prize award for discovering a life-saving treatment of pernicious anemia, admitted that wide gaps of knowledge still remain. But it is known, he said, that anemias may arise because the body lacks or can not make available at least three classes of dietary substances. These are iron, vitamin C and a mysterious substance contained abundantly in liver and, to a less degree, in certain other organs. It is this last mysterious substance which, if absent, makes normal blood formation impossible and leads to so-called pernicious forms of anemia.

Important as good diet is in prevention of the anemias, other conditions play a part, Dr. Minot explained. Growth of the individual and physical functions, such as the bearing of children by women, may enhance the deficiency of iron that leads to an anemic condition.

EXPECTATION OF LIFE OF THE WORKING CLASSES

LONGER life for the working classes in this country has been gained during the past quarter of a century as a result of public health activities, according to a report of the Metropolitan Life Insurance Company.

The expectation of life at birth for the industrial policyholders of this company crossed the sixty year mark for the first time in 1935. In 1911 the expectation of life at birth for this class of the population was only 46.63 years, whereas now it is 60.25 years.

Expectation of life at birth for the working classes is now almost as good as for the population as a whole. This is shown by a comparison of the life insurance figures with those of the United States Registration Area. For the whole population, in 1934, life expectation at birth was 60.79 years.

The gain in life expectation of the insured wage earners appears even more striking when compared with urban dwellers rather than with the population as a whole. This is a fairer comparison because the insured wage earners live chiefly in cities. White males of age 10 in the urban area of the United States gained 3.95 years of life from 1910 to 1930, while white male industrial policyholders at the same age gained 6.77 years from 1911–12 to 1930. At the same age white females in the industrial policyholder group gained a year more than those in the urban area of the United States.

The gain in life expectation for the industrial class is all the more striking and encouraging because it was made during a quarter century that included the period of the war, the devastating influenza epidemic of 1918–19 and the economic depression, each of which greatly affected the lives and health of the population. The report points out that "Throughout this quarter century, and in the face of the calamities mentioned, those charged with the administration of our public health activities have maintained a scientific attitude toward their duties. Current discoveries in medicine and sanitary science have been applied as soon as they had demonstrated their worth. The results are undoubtedly reflected in the highly gratifying figures that have been quoted."

ITEMS

THE discovery of a "new star," or nova, in the constellation of Sagittarius was, on October 7, reported to the international astronomical bureau at Copenhagen from Tokyo. It will be called Nova Sagittarii. As it is now sixth magnitude it is easily visible to the unaided eye. News of its discovery has been cabled to observatories throughout the world. The rise of a star from obscurity to brilliance, called a nova, signals a gigantic outburst by the star. The discovery was made on Tuesday (October 6).

AN unusual outburst of light in the bright northern star, Gamma Cassiopeiae, has been reported to the Harvard Observatory by Dr. Nicholas Bobrovnikoff, acting director of Perkins Observatory, Delaware, Ohio. Observed early on October 5 by Dr. Ernest H. Cherrington, Jr., the brightening may have important astronomical consequences. Astronomers throughout America are expected to watch the star. The outburst brought the magnitude of the star from 2.25 to 1.6, although its spectrum, always very peculiar, showed no unusual characteristics. The next morning the star seemed to have returned to normal, temporarily at least, for neither its magnitude nor its spectrum shows any conspicuous deviation from the normal.

A WEEKLY survey of the U. S. Weather Bureau reports that prospects for a good winter wheat crop are promising. Ample rains throughout the winter wheat regions have favored seeding, and much of the crop has already made a good start, furnishing excellent fall pasturage. Rains have been general over the once drought-afflicted West and Midwest, except on the northern Great Plains, where the need is sorest. The greatest improvement was noted in the southern part of the Plains area, centering in Oklahoma.

THE first cosmic ray radio data obtained by tiny balloons of cellophane from a height of about 14 miles have been secured by Dr. T. H. Johnson, of the Bartol Research Foundation of the Franklin Institute, and Dr. Alexander A. McKenzie, of the Carnegie Institution of Washington. The equipment consisted of three balloons tied together which expanded to a 13-foot diameter each when their top altitude was reached. Although the radio data, sent back to earth by short-wave transmitters from the unmanned balloons, have not yet been interpreted a large increase in cosmic ray intensity is noted. This finding, however, was anticipated.

A NEW type high-voltage atom smashing apparatus is now under construction by the department of physics of Stanford University which has tentatively been called the "rumbatron." Choice of this name has been made to distinguish it from the "cyclotron," first developed and used at the University of California by Professor E. O. Lawrence. The rumbatron consists of a cylinder 40 inches in diameter enclosed in a vacuum. Inside the cylinder are a filament and a grid which act like a giant radio tube. Electrical oscillations are set up in the apparatus somewhat similar to the squeals of a radio set except that they have a frequency much too high to be heard by the human ear. When electrons are introduced into the cylinder they are accelerated by the oscillating field and, in present design, will attain energies equivalent to 5,000,000 electron volts for a single trip through the cylinder. If additional energy is needed for experiments on nuclear disintegration the electrons can be sent on two, three or as many trips as necessary. An important difference between the new rumbatron and the better-known cyclotron is that the former uses electrons as the bombarding particles while the cyclotron employs atomic nuclei themselves, which are much heavier.