pathologist with the Coker Pedigreed Seed Company of Hartsville, S. C.

DR. JOHN L. RICE, who was succeeded on July 16 as Health Commissioner of New York City by Dr. Ernest Lyman Stebbins, has been appointed deputy health commissioner at a salary of $7,000 a year.

CHARLES A. MABEY, physicist of the Bristol Company, Waterbury, Conn., has been appointed director of the research activities of the company.

W. W. DESCHNER, of the department of chemical engineering of the University of Kansas, has been appointed head of the division of chemical design, engineering and construction at J. F. Pritchard and Company, Kansas City, Mo.

IT is reported that an expedition to study cosmic rays, sponsored by the Academy of Sciences of the U. S. S. R., led by Professor A. I. Alikhanov, will be in the field for about six weeks making observations at the high-altitude meteorological station in the Alpaz mountains.

SCIENCE SERVICE reports that four scientific men from the Argentine will make a survey of industrial utilization possibilities of farm crops and wastes in the United States. The visit was arranged with the Government of Argentina by the State Department, the coordinator of Inter-American Affairs and the Department of Agriculture. Carlos Clementino Zarate and Oscar Saturnino Mallea, of the University of Santa Fé, both of whom are especially interested in problems of farm waste utilization, and Dr. Enrique Duprat, of the University of Buenos Aires, who will look into possibilities of industrial products from corn and wheat, have already arrived. At the end of the month they will be joined by José Baialardo, chemical engineer of the University of Santa Fé. Several weeks will be spent visiting the four regional laboratories of the Department of Agriculture at Philadelphia, Peoria, New Orleans and Albany, Calif., followed by six months of intensive research at whatever laboratory and in whatever line of work each visitor may select.

A SYMPOSIUM on synthetic rubber will be held by the American Chemical Society at the Buffalo meeting on September 9. Dr. E. R. Weidlein, director of the Mellon Institute and technical consultant on rubber of the Reconstruction Finance Corporation, will speak on "The Progress of Synthetic Rubber Production"; Albert L. Elder, of the Materials Division, War Production Board, on "The Progress of Butadiene Production," and Willard H. Dow, president of the Dow Chemical Company, on "The Progress of Styrene Production."

IN addition to the Training School for Electricians, already in operation at Iowa State College, the Navy will establish a Diesel school there. The college will furnish both instruction and buildings for the school, which will open about the middle of September.

A NEW cooperative program for industry and education has been initiated for chemists at the Illinois Institute of Technology. Fifty students have entered the first academic session of a cooperative course in chemistry, after completing sixteen weeks of work in industry, while a similar group will begin study in September. The program is the first of its kind in the Chicago area, having been organized only this spring. For the last seven years a similar course has been offered in mechanical engineering. Five hundred students are now included in that program. Plants cooperating hire the students in pairs so that one works while the other studies. The plan not only allows the students to earn a large part of their expenses while completing work for an engineering degree in five years, but also gives them the advantage of actual experience in industry. Standards are high. The student must be in the upper fourth of his high-school class to be considered an applicant and must pass aptitude and general tests before being finally admitted. The academic work of the program is done at the Lewis Institute.

IT is reported in *Nature* that a Free German Institute is being founded by the science section of the Free German League of Culture in Great Britain. The aims of the institute are: to uphold and develop the valuable traditions of the Free German research work and teaching; to provide for interchange of opinion between Free German men of science and those of the United Nations; to strengthen the German refugee youth in the spirit of international understanding and to enable them to help in reshaping Germany's cultural life after the destruction of Nazism. The opening session was held on July 17, when an address was given by Dr. Joseph Needham. Further particulars of the movement can be obtained from the secretary, Free German League of Culture, 36 Upper Park Road, London, N.W.3.

DISCUSSION

SWEDISH OCEANOGRAPHIC RESEARCH IN 1941

THE rotating "inertia currents" discovered by Swedish oceanographers in the Baltic Sea in 1931 have been further studied by Dr. B. Kullenberg in this institute in collaboration with Mag. I. Hela of Havs-

forskningsinstitutet of Helsingsfors, utilizing measurements from the last international cruise in July–August, 1939. The analysis of sustained observation series, partly from anchored ships, partly by means of recording meters below subsurface carrier buoys, prove the rotating current component of 12 pendulum hours' period to be practically of the same phase across the central Baltic, from the Swedish island Öland to near the coast of Lettonia. This implies that the whole surface watermass down to the thermocline near 20m:s depth is carrying out a rotatory movement with a horizontal amplitude up to 5 kilometres. In addition tidal currents of the M_2-period with a maximum velocity of 2 cm/sec. were for the first time ascertained to occur in the Baltic.

The vacuum core-sampler constructed by Pettersson and Kullenberg has been further developed. With a 2″ tube cores up to 12 metres long have been sampled from the Gullmar Fjord (115 m), and have been submitted to pollen analysis. Also from the Baltic coast cores of 7 metres length have been sampled with a shorter tube. They show distinct varves, also such of recent date, and thus promise to allow of a linking up of the post-glacial chronology of De Geer with our time. By means of a special contrivance it has been possible to make the length of the cores agree to within a few per cent. with the depth of submergence in the deposit, the cores being thus truly representative of the stratification *in situ*.

An examination of the radium content in manganese nodules from the Challenger expedition, central Pacific Ocean, has proved the very high content of the outermost layers, 10^{-10} gr Ra/gr, to decline rapidly inwards to quite low values near the nucleus. Apparently the Ra-ions attracted by the manganese, either from the sea water or from the surrounding sediment, show the characteristic decay of 1,580 years half-period. From the figures thus interpreted the rate of growth of the nodule is estimated at 1 millimetre in from 700 to 1,500 years. The more rapid growth to the upward direction, indicated by the convex shape of the largest nodule, is probably due to the accretion of sediment from above, the rate of sedimentation being thus found of the order 1 millimetre in 1,000 to 2,000 years, apparently the first estimate of the accumulation of red clay based on measurements. The figures are subject to a final revision on the conclusion of a more detailed study now in progress, where the radium content is being related, not to the gross weight of substance but to the content of manganese.

Preliminary measurements made several years ago on the vitamin D content in diatoms, collected in larger quantities during the spring increase here, had indicated the presence of considerable amounts of the antirachitic vitamin, which were, however, much increased by exposing control batches of the same diatoms to intense ultraviolet radiation from a quartz lamp. These investigations have now been resumed in collaboration with the new State Institute for Public Health of Stockholm, Director Professor Abramsson, where biological tests were carried out with diatoms collected from Bornö Station on the Gullmarfjord. The results were negative with non-radiated diatoms, probably owing to the available quantity being rather limited, whereas the same quantity of diatoms after uv-radiation gave a relatively high vitamin content, the oil extracted being even richer in the D-vitamin than codliver oil. It therefore seems likely that the vitamin D found in many marine organisms may in fact be identical vitamin D_3 and especially that the vitamin D available in phytoplankton and hence their value as primary foodstuff for marine organisms may depend on the ultraviolet daylight penetrating into the surface layers of the sea. This also suggests the tentative explanation for the preponderance of certain year-classes of food-fishes, and all it implies for the economic yield of the fisheries, that it may be due not only to the quantity of foodstuff available during the critical weeks in the existence of the fish-larvae (when their percentage of survival is largely determined) but also to its *quality, i.e.,* to the amount of vitamin D produced in the phytoplankton by the antirachitic daylight components reaching down to the plankton-bearing layers. Further research along these lines is now in progress.

HANS PETTERSSON,
Director

SVENSKA HYDROGRAFISK-BIOLOGISKA KOMMISSIONEN AND OCEANOGRAFISKA INSTITUTET I GÖTEBORG

THE FIRST LAW OF FLUORESCENCE

THERE have been comparatively few rules and so-termed laws formulated and proved for fluorescence and phosphorescence. Probably the best known is Stokes's Law, although others of a more specialized nature may be found in the literature of the field.

In photochemistry, the very basic rule is the Grötthuss-Draper Law. Grötthuss, in 1817, while investigating the fading of alcoholic solutions of ferric chloride and other iron salts, concluded that only light which is absorbed can act chemically. This rather obvious statement, now called the First Law of Photochemistry, at first attracted little general attention. Later the Grötthuss Law was independently rediscovered by Draper, in 1843, in the course of investigations on the photochemical combination of hydrogen