UNIVERSITY AND EDUCATIONAL NOTES

GIFTS to Columbia University include $200,000 from Mrs. Charlotte E. De Sers, for the endowment of a professorship in memory of her father, Robert Johnson Niven, formerly a student of Columbia. The sum of $100,000 has been bequeathed by the late Charles H. Ditson to the department of music and by Frederick Bertuch to establish a fund for needy students; Colonel William Boyd Thompson, of Yonkers, formerly a student of the school of mines, has given $100,000 to the school of engineering. $70,000 from the Rockefeller Foundation has been received for research.

WORK will soon start on Ryder Hall, the new electrical engineering laboratory of Union College. The building is the gift of H. Russell Ryder, of New York, and will cost about $150,000. It will be completed next spring. Mr. Ryder has also provided for maintenance.

THE trustees of Pennsylvania State College have renamed the School of Mines and Metallurgy as the School of Mineral Industries. Expansion of all divisions of the School of Mineral Industries is expected with the completion next year of a new building for the school.

DR. GEORGE A. WORKS was formally inaugurated as president of the Connecticut Agricultural College on November 8. Governor John H. Trumbull extended the greetings of the state to the new president, and addresses were made by Chancellor Samuel P. Capen, of the University of Buffalo, and by President James L. McConaughy, of Wesleyan University.

THE *Experiment Station Record* reports that George S. Templeton, head of the animal husbandry department of the Mississippi Agricultural College and Station for the past six years, recently resigned to accept a position with the educational bureau of the National Cottonseed Crushers Association. D. S. Buchanan, professor of animal husbandry and associate animal husbandman, has been appointed head of the department, and the resulting vacancy filled by the appointment of R. H. Means.

DISCUSSION

THE OCCURRENCE OF ROTENONE IN THE PERUVIAN FISH POISON "CUBE"

A METHOD of fishing employed by natives of tropical countries is unique and effective. They throw pounded poisonous plants into streams or pools to stupefy the fish. This causes them to rise to the surface of the water, whereupon they are speared or netted.

Some of these fish poisons, notably certain species of Derris, have been shown to be good insecticides and therefore have attracted the attention of entomologists and others interested in insect control. However, little botanical information is available concerning many of these plants, which are known by native names only.

Derris has been the member of this group of poisons most extensively investigated, and rotenone has been shown to be the active principle of two species, namely, *Derris chinensis* and *Derris elliptica*. Rotenone has also been isolated from plants other than Derris, namely, *Lonchocarpus*,[1] *Milletia taiwaniana*, Hayata,[2] *Mundulea suberosa*, Benth,[3] and *Ormocarpum*.[3]

Among the poisonous plants that have recently attracted attention as insecticides is the Peruvian fish poison "cube." It is the root of a plant whose botanical classification is uncertain, but it is thought to be *Tephrosia piscatoria*. "Cube" is an active insecticide, and a patent has been granted covering its use for this purpose.[4]

Two samples of this material were examined, and in each case rotenone was found to be the active principle. In both cases rotenone was obtained by the usual procedure of ether extraction, after which it was purified by recrystallization from alcohol. The first sample of "cube" gave 7.2 per cent. of crude rotenone with a melting-point of 158°; upon recrystallization the melting-point rose to 163°, and when mixed with an authentic sample of rotenone there was no depression. George L. Keenan, of the Food, Drug and Insecticide Administration of the Department of Agriculture, found its optical properties to be as follows: In ordinary light the material consists of thin, irregular six-sided plates. The indices of refraction are $n_\alpha = 1.610$; $n_\gamma = 1.665$; both ± 0.003. The birefringence is very strong and the polarization colors brilliant. These data are identical with those obtained with an authentic analytically pure sample of rotenone.

The second sample of "cube" gave 7.1 per cent. of crude rotenone with a melting-point of 159°. Upon recrystallization it was identical with pure rotenone as to melting-point, mixed melting-point and optical properties.

From the information obtained with these two samples it would seem that "cube" would serve as an

[1] Greshoff, *Ber. d. d. Pharm. Ges.*, 9: 215 (1899); Tattersfield, Gimingham and Morris, *Ann. Appl. Biol.*, 1926, p. 424.

[2] Atsumi and Shinada, *Yearbook of Pharmacy*, 1924, p. 209.

[3] Greshoff, *loc. cit.*

[4] U. S. Patent 1,621,240.

excellent source of rotenone, provided the plant can be obtained in quantity.

E. P. CLARK

U. S. DEPARTMENT OF AGRICULTURE

ON THE PROPERTIES OF THE ELECTRON

SOME of the main difficulties of the Bohr atom disappear, the writer has shown,[1] if the electron possesses the property that it absorbs radiant energy during its motion, which induces a decrease of its electrical field and under certain conditions ejects again the energy as radiation. A deduction of these properties was given based on thermodynamics and kinetic theory, which will be further elaborated in subsequent papers. The results may also be obtained in other ways, one of which will be pointed out here.

Suppose that an electron gas kept at constant temperature is subjected to a powerful magnetic field. The path of each electron will now possess greater curvature than before, resulting in an increased transformation of its kinetic energy into radiant energy, due to the acceleration it undergoes. A limiting case is that the concentration of the electrons is so small that in most cases they pass clear across the chamber. Thus the kinetic energy of the electrons will continually decrease. But this is manifestly an absurd result. Hence each electron will on the average recover its velocity during collision. This can take place only at the expense of the surrounding radiant energy, since the kinetic energy lost took this form. If radiation has the orthodox form, namely, that it consists of continuous electromagnetic waves, the electron can recoup the lost energy only by the gradual absorption of radiant energy which is stored up as internal energy. Since the emission of radiation due to the acceleration of the electron depends on the curvature of its path, the rate of absorption of radiant energy will similarly be dependent. The increase in velocity during a collision of the electron can be caused only by an increase in its field during the process, its internal energy supplying the necessary energy. Hence its field decreased during its mean free path. These are the results obtained before.

R. D. KLEEMAN

SCHENECTADY, NEW YORK

MANAYUNKIA SPECIOSA (LEIDY) IN THE DULUTH HARBOR

IN the course of a biological investigation of the Duluth Harbor, specimens of *Manayunkia speciosa* (Leidy) were taken in the dredge samples. Dr. Leidy described this annelid in the *Proceedings* of the Academy of Natural Sciences of Philadelphia, 1883. There are some additions to be made and some differences in the description that will place this form in its proper place in an analytical table or key.

In general the worm answers to his description. The mature specimens measure about 2.9 mm, although individuals in the act of fission may reach 4.9 mm. These latter were the ones that Dr. Leidy made his description from, although he did not actually see them divide. The worm is somewhat transparent with some pigment around the branchial lobes, and the general shape is as he described it, except the seventh segment, which is no different from the rest except that it is about twice as long as the preceding segments. It is at this point that the worm divides, and, as Dr. Leidy rightly guessed, the expanded forepart of this segment is the beginning of a head for the new individual.

It has the characteristic tentacles and ciliated branchiae of the Sabellidae, but in the original description the collar was overlooked. This collar is open at the back with the ends flaring out but coming together when the worm is in a relaxed condition. There are no setae on the collar, but there are two pigment spots under it similar to the eyespots of the Oligochaeta. The ciliated branchiae are on branchial lobes which expand laterally. At the base of each branchia is a pigment spot. These can be seen only in the more mature individuals, the younger ones having fewer or none at all. I have counted up to ten on one lobe.

The pseudohemal system has a green fluid. This flows from two hearts at the base of the branchial lobes into the tentacles, then back down each side of the esophagus, uniting into a single vein which runs the length of the body ventral to the digestive tract. It flows through three pairs of loops, one pair in each of the last three segments, to a vein which forms a sheath around the digestive tract. Here it is pumped by a series of muscular contractions back to the head end of the body to begin circulation again. I failed to find the loops in any of the other segments as Dr. Leidy suggested they were.

The digestive tract is ciliated for the whole length. This seems necessary in view of the fact that the muscular contractions driving the pseudohemal fluid are from the posterior to the anterior end in opposition to the contents of the digestive tract.

The testes and ovaries are located as he described them. The female opening is between the fifth and sixth segment. In the one case where I was fortunate enough to observe the eggs being laid they measured .135 mm x .095 mm.

The setae and uncini are about as he described them except the pectinate uncini of the last three segments, which have from three to five rows, composed of six or seven teeth each.

[1] *Phil. Mag.*, 7: 493, 1929.