in Animal Nutrition in connection with the University of Aberdeen and the North of Scotland College of Agriculture. The new institute, which will be named the Rowett Research Institute, has secured the services of Dr. J. B. Orr, the director, recently associated with Professor E. P. Cathcart in the conduct of a study of the energy output of soldiers, and Dr. R. H. A. Plimmer, chief biochemist in the institute, a research worker in the Physiological Institute of University College, London.

PROFESSOR GEORGE C. COMSTOCK, director of the Washburn Observatory of the University of Wisconsin, forwards the following extract from a letter to be published as a warning to prospective victims: "A short time ago, a man representing himself to be a nephew of yours and giving his name as Mr. R. L. Denny, of 64 Riverside Drive, New York City, obtained a loan of $8.00 from me after putting up a good story of having lost his pocket-book, being a stranger in the city, etc. I have not heard of him since. I have reason to believe that he is a clever 'crook' working among college men."

THE British Ministry of Agriculture is arranging a series of investigations and exhaustive experiments with regard to certain aspects of foot-and-mouth disease, and for this purpose the Admiralty is placing obsolete warships at the disposal of the Ministry for use as floating laboratories. The ships will be fitted with every essential for the study of the disease, and it is understood that there is no intention of disclosing off which coast the ships will be stationed. An official of the ministry informed a representative of *The Times* that the experiments are to be carried out at sea to obviate any risk of the disease spreading from the experimental station. The investigators will include members of the staff of the ministry and other scientists, including several distinguished foreigners. In dealing with a disease of which the virus is presumed to be ultra-microscopical, and of which the contagion may be air-borne, the difficulties must be very considerable, and the research may last for years. A previous attempt was made to solve the problem by sending a commission of investigation to India, where it was found that cattle were immune. The necessity of stamping out the disease, it was pointed out, is imperative, if England is to maintain her large cattle exports. Foreign buyers will not take the risk of purchasing cattle in England for transport to the Continent while the danger of foot-and-mouth disease exists. So contagious is it that a healthy animal, passing along a road that had been traversed twelve hours previously by an infected animal, may contract the disease.

## DISCUSSION AND CORRESPONDENCE

### THE BOUNDARY BETWEEN THE SILURIAN AND DEVONIAN IN SHROPSHIRE AND FRANCE

DURING the German occupation of Lille, Professor Charles Barrois and his able assistant, Dr. Pierre Pruvost, being confined to the city, busied themselves as much as was allowed studying the many undetermined fossils that had been accumulated during the past twenty years by various coal companies of the Calais basin. Not only this, but they also studied in greater detail the local stratigraphy, with the result that we now have a preliminary statement from them entitled "Sur les couches de passage du Silurien au Dévonien dans le bassin houiller du Pas-de-Calais."[1] The complete work is to follow later.

The chief conclusion reached is that the line between the Silurian and Devonian should be drawn at the base of the lower Gedinnian, which in the Ardois is the Bois-Bernard arkose immediately beneath the tentaculite shales of Méricourt; in the Ardennes and Brabant this is the conglomerate of Fépin, which lies at the base of the Mondrépuits shale. To make this matter clearer, the authors also correlate the various horizons studied by them with those of Shropshire, with rather surprising results. All of the "passage beds" (Temeside shales at the top, followed beneath by the Downton Castle sandstone (= Tilestones), and the Ludlow bone-bed) are referred to the base of the Lower Devonian. The Silurian of the

[1] *Comptes rendus, Acad. des Sciences*, Vol. 167, 1918, pp. 705–710.

type area, therefore, ends with the *Chonetes* flags of the upper Ludlow.

These correlations have been accepted by L. D. Stamp for Shropshire and South Wales.[2] In southern Wales the *Grammysia* beds are regarded as transitional between the upper Ludlow and the lower Gedinnian, here the Trichrûg beds.

The evidence for drawing this boundary between the Silurian and Devonian systems is primarily based on diastrophism, though fossils have always been given full consideration, lithology being regarded as of least value.

It now appears clear that the black limestones of Bohemia known as the $Ff_1$ beds, and the Tentaculite limestone or the Manlius of New York must also go into the Lower Devonian. Just where the division line in Maryland, Pennsylvania, and New Jersey will be drawn is, however, not so clear, for here there appears to be a more or less complete transition from the Silurian (Tonoloway) into the Manlius equivalent. The last worker on this problem, J. B. Reeside,[3] was not able to adjust the matter.

Charles Schuchert

## THE MEASUREMENT OF POSTGLACIAL TIME

To the Editor of Science: The proposal of DeGeer to measure postglacial time in North America by the lamination of glacial clays and its criticism by Fairchild are of special interest to phytogeographers who see in early postglacial migrations of plants the fundamental explanation of the present conditions of plant distribution. Fairchild has taken exception to some of DeGeer's statements, especially his estimate of 20,000 years for postglacial time, and has apparently adopted Taylor's computation of 75,000 to 150,000 years for the recession of the ice from Cincinnati to Mackinac. In this connection it is of interest to refer to a paper of DeGeer's published in 1908. In it he stated that the recession of ice in southern Sweden was as slow as 25 meters per year, rose to 130 meters, stopped for 100 to 200 years, began again at 20 meters, and gradually accelerated to 400 meters per year. If one assumes DeGeer's minimum figure of 20 meters as an average annual rate in Michigan and Ohio, 36,000 years would be sufficient to cause an ice recession from Cincinnati to Mackinac. Since this region is farther south and with less rainfall than Sweden, it is fair to presume that the rate was much more rapid. Assuming DeGeer's average figure of 200 meters per year, 3,600 years would have produced the same result. Neither is it necessary to invoke the precession of the equinoxes to explain the fifteen frontal moraines on the way. DeGeer states that frontal moraines were formed in Sweden during a stationary period of 100 to 200 years. Such periods may have resulted from cylic variations in temperature, as DeGeer believes, or from similar variation in precipitation. The latter are of course well authenticated through the researches of Huntington and others. Allowing 400 years for such stationary periods, the total time of ice retreat over this distance is still within 10,000 years.

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[2] *Geol. Mag.*, April, 1920, pp. 164–171.

[3] Prof. Paper 108-K, U. S. Geol. Survey, 1917.

## EXPLORATIONS IN THE PANHANDLE OF TEXAS

The third expedition to northwestern Texas and Oklahoma completed its labors about the first of July. This expedition found more than two hundred small stone buildings in groups scattered through a territory approximately 200 × 100 miles in extent. It appears that these are not distinct Pueblo type of architecture but rather mark the gradual evolution of a nomadic buffalo-hunting tribe of Indians to people who lived in stone dwellings. Near the Oklahoma line the buildings are small and rudimentary, and as one proceeds westward they increase in size and numbers. The art also develops. A preliminary paper has been published setting forth the observations on the artifacts, irrigation ditches, pictographs and buildings. These will be mailed free of expense to any interested persons by the author.

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