attain success it would seem desirable (1) to study carefully the factors limiting the survival of a particular species of Pacific salmon, (2) to select an Atlantic stream furnishing the most suitable conditions and (3) to concentrate on that stream attempts at transplanation of the species, closely following the outcome.

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GLAUCONITE PSEUDOMORPHS AFTER OPHIURAN PLATES

MUCH has been written as to the origin of glauconite and it is not the author's intention to discuss the validity of these writings or to propose a new theory, but rather to record a new form in which this mineral is found.

The material which contained this glauconite is part of a collection made through the use of a grant from the American Academy of Arts and Sciences. The material was collected by the author on December 28, 1938 in a small stream valley just south of State Route number 44 at a point 3.3 miles east of Grove Hill, Clarke Co., Ala. The exposure consisted of a hard grayish clay which contained a number of *Scutella* sp. and large shark teeth. The age is Upper Eocene, Jackson formation. The author is also intebted to the Marsh Fund of the National Academy of Sciences for a grant which was used in washing and separating this and other Tertiary samples, from the Coastal Plain. The material upon washing proved to contain a great number of disarticulated Ophiuran plates, a great deal of glauconite and some foraminifera. The glauconite was removed from the calcareous material by an electric magnet, and from the former the pseudomorphs were picked by hand.

These pseudomorphs are of a slightly lighter shade of green than the rest of the associated glauconite grains. Their surface is smooth and not foliated or botryoidal as is customary, there being, however, several instances where the surface is cracked. Only pseudomorphs after the lateral arm plates of the Ophiurans were found preserved in this condition. None of the other twenty odd different types of plates was apparently affected or if they were their original shape had been so altered as to be unrecognizable. The lateral arm plates are much thicker than the majority of other plates and also a great deal more numerous. There are 3,682 of one type of lateral arm plate from this locality, which do not show any alteration, indicating that this type of preservation is rare and confined to the most common of all the plates.

The present-day accepted theory as to the origin of glauconite is that it is an alteration of biotite under certain conditions. Undoubtedly this is true in most cases for the foliated structure of many of the glauconite grains clearly shows this affinity. But does this theory hold for all grains of glauconite? When biotite alters to glauconite there is an expansion which takes place perpendicularly to the biotite cleavage.[1] If such expansion had taken place in these Ophiuran plates why were not their original shapes and proportions distorted? However, in no case was there any evidence of such distortion. This lack of foliation and accompanying distortion seems to indicate a somewhat different origin for the glauconite pseudomorphs in this individual case.

In order to see if the original reticulate structure of the Ophiuran plates had been retained after alteration several sections were ground and these sections showed that the original structure had been retained.

The material from this one locality in Alabama is the only instance which the author has observed where Ophiuran plates were replaced by glauconite. The identification of these lateral arm plates has not been worked out as yet beyond the fact that they belong to the genus Ophiura.

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BOG LEVELS[1]

ALTHOUGH it is well known that there is fluctuation in the levels at the edge of bog mats, finding the forested bog mat riding the crest of seasonal waves appears quite intriguing to the author and seems to be worthy of notation.

For a number of years ecological work has been carried on in the Mud Lake Bog in Cheboygan County in northern lower Michigan. In 1922 this work included the determining of the profile of the bottom of the bog. Underneath the forested mat east of the lake, a considerable area of the sandy bottom was flat and equidistant (10.5 feet) from the surface. In subsequent years, determinations of the depth to the sandy bottom were made in the same part of this area. Previous to 1928 the layers to sand included the mat (Sphagnum and Chamaedaphne growing among *Picea mariana,* black spruce), below which was a layer of disintegrating plant parts, and below this a layer of brown peat, becoming firmer and blacker as the borer went lower. From 4 to 6 inches of blue clay filled with shells of Pleistocene age rested on the flat sand bottom.

Up through 1927 borings on this area gave the same depth to bottom. In 1928, however, following unprecedented heavy snow, it was discovered that it was a greater distance to the sandy layer than had previously

[1] E. W. Galliher, *Geol. Soc. Amer. Bull.*, 46: 1356, 1939.

[1] Contribution No. 402, Department of Botany and Plant Pathology, Kansas State College, Manhattan, Kansas and U. of Mich. Biological Sta.

been recorded and that below the upper brown peat was a wetter, soupier peat. The forest-covered mat had risen a foot and a half from the previous year. Up to this time evidence pointed to the normal development that is to be expected in the filling in of northern bog lakes in their conversion to land. With the breaking loose of the mat and the insertion of what might be called an unconformity, the tree-covered mat has now shown fluctuations from year to year, the measurements being made with the same instruments within 5 feet of the same place each year and at about the same time late in July. These figures, as expressed in Table 1, have shown a rise of the tree-covered mat as much as 2.2 feet above the datum established in 1922 and although accompanied by lower stages have so far never reached the low level known before 1928.

TABLE 1

DEPTH FROM SURFACE OF SPHAGNUM TO SAND BOTTOM AT THE SAME PLACE ON THE MAT AT MUD LAKE BOG

Year	Feet	Year	Feet
1922	10.5	1931	11.0
1923	10.5	1932	11.0
1924	10.5	1933	11.7
1925	10.5	1934	11.5
1926	10.5	1935	11.8
1927	10.5	1936	11.25
1928	11.5	1937	11.5
1929	12.0	1938	12.7
1930	11.5	1939	12.3

If pollen percentage profiles are made in fluctuating parts of such bogs comparable measurement of depth is another problem to consider.

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HURRICANE INTELLIGENCE

A VERY unusual phenomenon in the field of mental testing was observed at the Massachusetts State College, Amherst, Mass., during the hurricane of September 21, 1938. In accordance with previous scheduling, a mental test was administered to the freshman class during the major part of the storm. In spite of very poor illumination (due to failure of electricity), falling trees and the characteristic weirdness both of sound and vision which prevailed, the freshmen showed a 20 per cent. superiority over the previous ten-year average. Other tests administered to the same freshmen show this class to be about average. This marked superiority under what would appear to be very adverse conditions has attracted much attention. Coincidence and chance do not appear to adequately explain these results. When all conceivable factors are considered, it appears plausible that the unusual amount of ozone in the air during the hurricane served as a mental stimulant to the freshmen. Authority for asserting the presence of relatively large quantities of ozone during the hurricane is expressed in a note in SCIENCE of November 24, 1939, by Dr. C. A. Peters.

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LUNAR RAINBOWS IN HONOLULU

I DO not know if readers of SCIENCE want to hear any more about rainbows in Honolulu, but I spent my boyhood there and can still remember the glorious sight of the lunar rainbows. I remember once seeing a double one. I think the reason why one sees such brilliant rainbows, especially on Oahu, is that several times a day a squall of rain is likely to originate in the cloud cap over the Koolau range and to travel southward down one of the valleys. While the mountain range that runs from east to west throughout the island is covered with a black cloud, a few miles out at sea the sun is shining brilliantly. There are no clouds there. Obviously, the conditions are ideal for the frequent formation of unusually beautiful rainbows.

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SCIENTIFIC BOOKS

ANOTHER INVENTOR OF THE CALCULUS?

James Gregory, Tercentenary Memorial Volume. Edited by HERBERT WESTERN TURNBULL, F.R.S. vii + 524 pp. London, 1939.

THE subtitle to this handsome memorial explains that the volume contains Gregory's "correspondence with John Collins and his hitherto unpublished mathematical manuscripts, together with his addresses and essays, communicated to the Royal Society of Edinburgh, July 4, 1938." James Gregory (1638–1675) is probably the most justly celebrated of nineteen notable members of a famous Scotch family whose ability persisted through several generations, in mathematics and in medicine. The nauseous, gritty mess known as "Gregory's mixture" or "Gregory's powder," was perpetrated by one of the medical Gregorys; and for all the reviewer knows to the contrary, it may still be inflicted on helpless bairns.

The hero of the present memorial was a mathematician. His short life fell in one of the major epochs of mathematical history; and had he been nearer the center of things, James Gregory might have left a far greater name than he has. Before beginning his bleak professorship at the University of St. Andrews in 1668, Gregory had profited by four years on the Continent, mostly in Italy, where he seems to have absorbed