periments made on two specimens in a tent with a flashlight and observations made in the Philippines concludes that the synchronism in the flashing of a group of fireflies is accidental and of very rare occurrence

Mr. Olaf O. Nylander, of Caribou, Me., to whom I sent a copy of my firefly article, in a letter dated October 8, 1916, says that a number of years ago, while walking from Caribou Mills to his home, he noticed in a small clearing the greatest assembly of fireflies that he had ever seen; the ground and stumps were fairly aglow. The flashes were not perhaps as regular as an army officer would like to see in regimental drills but were so rhythmic that any one would take note of their action. He also observed that the air was very damp at the time.

In *The Scientific American* of January 19, 1918, Mr. John V Purssell, of Washington, D. C., records that

> In the town of Cotabato, Island of Mindanao, P. I., a few years ago, there were two trees about the size of apple trees, and perhaps a hundred feet apart, and every evening these were filled with fireflies which flashed in synchronism, first one tree lighting up and then the other. There must have been several thousand insects in each tree, yet the synchronism was so perfect that rarely or never did a single firefly flash at the wrong time.
>
> To the best of my recollection the illuminated period lasted about two or three seconds and the dark period perhaps twice that long. I can positively vouch for the accuracy of the foregoing for it seemed so strange, and produced so beautiful an effect that I thought it one of the most remarkable things in the Philippines, and it made a deep impression on me.

The independent observations of this synchronism in the flashing of fireflies by the author in Gorham, Me.; K. G. Blair in Europe; S. Shelford in Borneo; Dr. H. C. Bumpus near Woods Hole, Mass.; H. A. Allard in Oxford, Mass.; Olaf O. Nylander in northern Maine and John C. Purssell in Mindanao, Philippine Islands, are I think quite sufficient to establish the fact that these insects do at times flash in unison. The rarity of the occurrence is a mystery.

In this connection a coincidence might explain a well-known occurrence in a small group of individuals, as at a dinner party when they all cease talking for an appreciable time, but would not explain the quiet pause which one sometimes observes in a large dining hall containing hundreds of diners. I discovered the cause of this phenomenon some years ago. While dining with a number of friends at the Parker House the guests at a neighboring table had been noisy, even boisterous, doubtless we had been somewhat noisy too. The neighboring table suddenly became quiet and we stopped talking to see if the noisy ones had gone, but they were still there, other tables looked about for the pause and this hush spread rapidly through the hall. Dear old Dr. Virchow had often observed this pause and thought my explanation correct. He also told me that it was a saying in his country that when this hush occurred an angel was passing through the room, also that a lieutenant was paying his debts! So in regard to fireflies a dozen or more might flash for awhile in unison as a coincidence, but when thousands are observed to flash in unison no doctrine of probability or chance can account for it.

EDWARD S. MORSE

SALEM, MASS.,
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THE VERO MAN AND THE SABRE TOOTH

IN determining the relative antiquity of the Vero man and the fossil plants and animals there associated, certain larger factors yet require attention. The direct evidence has been minutely examined from varying points of view: geologic, paleontologic, anthropologic. It seems conclusive that the man of Vero reached one of the last lairs of the sabre-toothed tiger, as Dr. Hay contends; while Berry discloses a degree of change in the local flora not to be ignored. But, on the other hand, the anthropologists show that the accompanying artifacts are like those elsewhere recent.

Perhaps the anthropologists have the best of the *argument,* as such. Florida has retained much its present outline since the close

of the Eocene, sometimes a little below the ocean level, never far above. Geologic change has been at no time great enough to prevent the easy reentrance of the sub-tropic vegetation, persistent in the United States at three points only—the Lower Colorado, the Lower Rio Grande, and the lower part of the "spruce pine," and *Pinus heterophylla* sections of Florida. In each of these widely separated regions larger continental features tend to create and maintain melior climatic conditions. The Colorado cuts deep, and holds its valley protected from the cold. The gulf warms the low coastal strip markedly as far north as the mouth of the Rio Grande; and Florida, though flung well out to sea, so blocks the warmer gulf waters that the southern half has long held to the favorable mean of dry days, rain-and warmth. Long coastal barriers afford further protection.

Even a cursory glance at forest distribution in Florida serves to throw into relief the belts and regions of change of first concern. The upper half of Florida is still favorable to the "long leaf pine" (*Pinus palustris*), and now undergoes marked variation in its winter temperatures. Facing the Atlantic, this forest sharply gives way to the "spruce pine," and not far below Vero the palmetto-cycad underbush begins. Along the southern-western coast, is the region of "pine islands and cypress straits," as Bowman says, "even more monotonous than the east coast." All the higher ground is invested by a *Pinus heterophylla* forest, with a nearly pure palmetto underbush, while the cycads also show a different facies. The *Zamia floridana* is rare in the open woods, although the *Z. pumila* grows more characteristically inside the mangrove fringes next the coast.

The Vero man thus occurs near the border of the "spruce pine" (*Pinus glabra*) forest, with its striking and unique underbush of cycads and bush palmetto (*Zamia floridana* and *Sabal serrulata*). The latter in places make up the underbush nearly in equal numbers. But that this striking forest facies earlier extended to the north of Vero is probable; while in any case Vero lies within a region locally characteristic for its old floral elements, and of generally soft climate since the Eocene.

Evidently the "spruce pine" country exemplifies a pronounced type of the so-called "asylum" or isolated and persisting habitat subjected throughout long periods of time to the minimum of environmental change. Especially the cats earlier tended to drift to the south; and there the man of Vero found them when he reached that soft climate and employed or developed arts admittedly recent. Seemingly too, the fossil plants and animals of Vero, after persisting beyond their geologically appointed time, were finally cut off by changes relatively slight.

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SCIENTIFIC BOOKS

Fossil Plants. By A. C. Seward. Cambridge Biological Series 1917. Vol. III., pp. xviii + 656, 629 figs.

The present volume, the third of Seward's great work, Volume 1 having been published in 1898 and Volume 2 in 1910, is appropriately dedicated to the late Professor Zeiller, the dean of paleobotanists. It is to be followed by a fourth volume, which it is stated is already in press, and which will discuss the remaining gymnosperms—the great group of angiosperms, so abundant in the fossil record from the mid-Cretaceous to the present, apparently not coming within the category of fossil plants in the mind of a British botanist, which is quite in keeping with British tradition and practise.

Volume 3 opens with a very satisfactory chapter devoted to a discussion of existing cycads, largely an abstract of already published data. Then follow three chapters devoted to the Pteridospermæ. These are divided into three families—the Lyginopteridæ, Medulloseæ and Steloxyleæ, and are rather fully and very satisfactorily discussed.

The remaining structural forms that are probably more or less closely related to the foregoing pteridospsrms are considered to represent the following seven families: Megaloxyleæ, Rhetinangieæ, Stenomyeleæ, Cyca-