DISCUSSION

JUVENILE CHARACTERS OF ROYAL PALMS

FOUR species of royal palms are now represented in southern Florida and may be distinguished in their juvenile stages by leaf characters that are not apparent in the adult palms. Flowers and fruits are not produced until the palms are from 25 to 30 feet tall, when the leaves and inflorescences are out of reach for comparison. Little dependence can be placed upon the sizes and shapes of the trunks, which vary with conditions of growth from slender and tapering to robust and ventricose. Most of the adult palms in Florida are of the native species, *Roystonea floridana,* which is being used extensively for street and ornamental planting, but other species are being introduced, so that means of distinguishing them are of increasing interest.

The Barbadian royal palm, *Roystonea oleracea,* is characterized by the pinnae of the juvenile leaves being wide and pendent, in contrast with narrow spreading or erect pinnae in the other species at the corresponding stages of growth, when the plants are from 3 to 6 feet high. In the younger stages of *oleracea,* the leaf-sheath, petiole and rachis are tinged with a deep red, the color being nearly the same as that of the small appressed scales scattered over the surface, while in the other species the surfaces are green, though the scales are reddish or brownish.

The leaves of the Cuban royal palm, *Roystonea regia,* have close-set narrow erect pinnae, in contrast with spreading or horizontal pinnae in other species at the same stage of growth. Also the reddish-brown scales of the leaf-sheaths continue in the Cuban species to be very abundant after the trunk-forming stage of the plant has been reached, and on many individuals even to the fruiting stage, while the other species have fewer and smaller scales, so that the leaf-sheaths usually appear entirely clean by the time that the trunks are a few feet high.

The royal palm of Puerto Rico, *Roystonea borinquena,* and the native royal palm of Florida, *Roystonea floridana,* are alike in the narrow spreading pinnae of their juvenile leaves, but the Puerto Rican species has a lighter green color and the surface scales reach a larger size, so that the rachis and petiole have a notably freckled appearance; also the midrib of the pinna has a readily perceptible row of scales, while in the Florida species the scales are relatively minute and inconspicuous, the difference being obvious when the pinnae are about half an inch wide.

The pinnae of *Roystonea floridana* later are much wider and rather close-set and drooping, in notable contrast with narrower and more erect pinnae in *Roystonea regia,* the Cuban species. Even in the adult stage a greater tendency to erect pinnae may be seen in the Cuban palm, though all the species share the adult character of having the pinnae inserted at different angles to the rachis. Another adult difference is that the petioles of the Florida palms tend to be more rigid, so that the leaves do not droop around the leaf-sheath bundle as in the Cuban species, but form a broad umbrella crown, in this respect having a greater resemblance to the Barbadian species, *Roystonea oleracea.*

O. F. COOK

BUREAU OF PLANT INDUSTRY

SYNCHRONOUS FIREFLY FLASHING

IN his recent note on synchronous flashing of fireflies experimentally produced,[1] Mr. John Bonner Buck regards his experiments with *Photinus pyralis* as indicating that "the whole process depends on the fact that all the [sedentary] females reply to each of the flashes of the male at the same definite [time] interval," thus gradually causing all the males approaching them on the wing to flash in unison. From the wording of the last two paragraphs of his note I infer that Mr. Buck interprets his observations on this one insect as offering a possible solution to the problem of synchronous flashing of fireflies in general. A tropical species of *Photinus,* however, a medium-sized, dark-colored Jamaican insect identified by Mr. H. S. Barber as probably *P. maritimus* E. Olivier, behaves so differently from *P. pyralis* as to convince me that there must be several causes of synchronous flashing and that the habit therefore needs to be separately studied and explained in each species that exhibits it.

On a broad open "common" near Mandeville, Jamaica, I found *Photinus maritimus* abundant during the latter part of February and the early part of March, 1931. I was told that simultaneous flashing was not unusual, but until March 8 I failed to see it. On that date, between 10 and 10:30 P. M., and on subsequent nights, I saw constellation-like groups of simultaneously flashing insects forming and disintegrating at different points among the large and active firefly population then on the wing. Sometimes it was possible to see as many as three such groups, each flashing like a constellation of from 20 to 40 stars. The flashes were single, of short duration, their apparent brightness at distances of from 50 to 75 yards intermediate between the luminosity of the north star

[1] SCIENCE, 81: 339–340, April 5, 1935.

and the brighter "pointers" of the dipper. The groups did not flash simultaneously with each other, but their rate, like that of the independent individuals, was very uniform—20 or 21 flashes to the minute. The groups would remain clearly defined for two or three minutes, each one drifting slowly and horizontally in its own direction at a height varying from 10 to 25 feet above the ground. They would then disintegrate, their members gradually "falling out of step" with each other. Not all the fireflies of this species in sight flashed with the groups—some were always showing their lights independently—but the great majority of those in a given area would temporarily band together.

At Pepper, in the Santa Cruz Valley, St. Elizabeth, on the evening of March 21, 1931, I saw two individuals, apparently of this same species, flying straight ahead across a common at a distance of about 20 feet from each other and 6 feet above the ground. While I watched them they flashed in perfect unison 14 times at intervals of about 3 seconds. They then disappeared behind some shrubbery. I did not measure the distance traversed in this way, but according to my recollection it could not have been much less than 100 yards.

Though I have no suggestion to offer regarding the cause of either of these types of simultaneous flashing I can not believe that they are to be explained as responses to females in the grass. Superficially, at least, they present an analogy with the simultaneous movements of birds in a flock or of fishes in a school.

GERRIT S. MILLER, JR.

U. S. NATIONAL MUSEUM

SCIENTIFIC MEN AND THE NEWSPAPERS

MORE important than any of the achievements of science are the philosophical implications of its discoveries—the need for leadership in thinking, leadership in the social and economic applications of the discoveries. In this leadership scientists are not prominent. Their failure to guide the public in adjusting the problems of plenty which the scientists have created may account largely for our economic and social crisis. This failure is due largely to the fact that the scientists have been keeping out of the newspapers, out of the place where the public can get acquainted with them, out of the place where the masses make up their minds what kind of leadership to follow.

The failure is mostly due to a mechanical maladjustment, to the fact that the scientists do not speak the language of the newspapers, that is, of the national forum. That language requires emotional appeal. For we are interested mostly only in those things which stir our emotions. We are likely to act only when our emotions are aroused.

The leaders of national thought take this emotional factor into account. If scientists did likewise, the public would listen to their message. It is because they have not done so that we see such an amazing situation as the attempts to solve unemployment without applying the first principle of science, which is to measure the precise dimensions of a problem. Because this principle is not understood, no one has taken an exact census of the unemployed.

The same lack is apparent in proposals to establish social security, such as old age pensions and unemployment insurance. The lack rises from the fact that the people as a whole have no adequate realization of the nature of the scientific approach.

They lack this realization because the scientists have not been telling in the newspapers the story of the frequently dramatic results of using the seemingly prosaic scientific approach. Much can be said on both sides as to why the scientists have kept out of newspapers. But I do not think there is any question about the harm done by the long years of scientific aloofness.

Honesty is the great need in guiding a baffled nation. I know of no place where all the principles of honesty, intellectual and moral, are so rigidly and openly spread as in the publications which scientists write for each other. These models the public almost never sees. The scientific riddles which are solved through this kind of honesty the public hears of only infrequently. Unless the public is to remain ignorant, and do so to its great harm, the place to tell about these scientific achievements and their implications is in the daily newspapers.

HOWARD W. BLAKESLEE,
Science Editor

THE ASSOCIATED PRESS
NEW YORK

BIOLOGICAL ABSTRACTS

WE believe that there are many zoologists who, like the writer, unconnected with *Biological Abstracts,* have heard with dismay of the reported decision of the Rockefeller Foundation to discontinue its support of that journal. Through a period of more than eight years we have become accustomed not only to lean heavily upon the *Abstracts* for information in our own fields of research, but also to use it for the revision and strengthening of our lecture notes in fields more remote. In the preparation of the latter we have become acquainted with many books and articles of which we would otherwise have remained totally ignorant. The titles of many biological publications are woefully inadequate in giving a true idea of their contents, and he who depends upon titles misses many sources of pertinent knowledge. The reading of the