

### MULTIPLE PINE SEEDLINGS

THE occurrence of two well-developed seedlings from the same seed seems to be very rare in pines.<sup>1,2</sup>

A list of instances of multiple seedlings among pines may be of interest to which similar observations may be added.

Observer	Species	Instance
Toumey <sup>3</sup> (1923)	<i>Pinus thunbergii</i>	1
Jacobs <sup>4</sup> (1925)	<i>P. lambertiana</i>	12
Clare <sup>2</sup> and Johnstone (1931)	<i>P. torreyana</i>	2
	<i>P. sabiana</i>	2

	<i>P. cembroides</i> var. <i>monophylla</i>	2
Moskedal <sup>5</sup> and Johnstone (1936)	<i>P. coulteri</i>	1
	<i>P. jeffreyi</i>	6
	<i>P. lambertiana</i>	2
	<i>P. monticola</i>	3
	<i>P. muricata</i>	1

All the above observations have been made by the several observers incidental to seed germination tests.

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## SCIENTIFIC BOOKS

### THE NATURALISTS

*Green Laurels. The Lives and Achievements of the Great Naturalists.* By DONALD CULROSS PEATTIE. New York: Simon and Schuster, 1936; 368 pp., 32 illustrations.

FIVE or six years ago there was published a most interesting book by Bernard Jaffe, entitled "Crucibles." In the course of 378 pages it described, in the most lively fashion, the lives and labors of about sixteen of the greatest workers in chemistry and physics, beginning with Trevisan (1406-1490), and ending with modern workers, in some cases (as J. J. Thomson) still living. It was shown how the beginnings of chemistry were apparently sterile, devoted to efforts which wasted lives and money, and led to no tangible results. Yet out of all this there emerged, gradually, an understanding of natural laws, and through the efforts of keen minds, modern science took form and led to the amazing discoveries and inventions with which we are all familiar. Although the names selected represent only a very small percentage of the efficient workers, it is true that the great steps in advance were due to very few men, who often had to struggle for recognition. There was in fact a double struggle; first, that within the man, to develop his ideas and come to an understanding with himself, and then the difficult task of making others see with his vision. Such a book telling such a story represents the best type of historical writing, capable of inspiring respect for the achievements of the past and hope for those of the future.

This success having been attained, it must have occurred to many that other fields of intellectual effort were equally worthy of such elucidation. Peattie has chosen to take the naturalists, and a better choice could not have been made. Chemistry and physics are great, we feel for them the utmost respect, perhaps we should say reverence; but it is for living things that we have affection, life is above and beyond all

the marvels of inanimate nature. The new book might have been about the people known as biologists; the wonders of embryology, physiology, genetics and all those things which belong to the laboratories and experimental gardens. There is plenty of material for such a work, and perhaps our author will undertake it at some later date. But we are now concerned with those who were intimate with nature in her own home, who visited her and took delight in the contemplation of her diversity and beauty. Their attitude was emotional as well as intellectual, calling forth the whole range of human faculties. Through an understanding of their work, we sense the richness of life on the globe, the pageant which is continually passing before our too unobserving eyes. Thus the book is at once a story of romance and an invitation to a feast. The events narrated run more or less parallel with those of chemistry. The early workers struggled with confused ideas, but nevertheless made progress. The great variety of living things came to be appreciated as the world was explored, and as the invention of the microscope revealed the thousands of minute creatures, invisible to the naked eye. The chapter "Science at Court" shows us the time of Louis XV in France, when Buffon and Réaumur were rivals, and tells how Réaumur died, leaving manuscripts which were declared by the great Cuvier to be worthless. They might have been lost forever, but for the fact that W. M. Wheeler, visiting Paris in 1925, had the curiosity to look them up. He found that they included many careful and accurate observations on ants, and three years later published a translation. There are two excellent chapters on Linnaeus, followed by a chapter on "Glories and Follies of the Linnaean Age." The seventh chapter deals with Lamarck, whom the author regards very highly, and then we come to a discussion of "Anatomist against Dreamer: Cuvier and Lamarck." It concludes thus:

"It would be a blow, too, for Cuvier if he could see where Lamarck stands to-day. Cuvier, who knew a thousand facts, was the author of the worst theory of the history of life that was ever suggested by a great scientist. The true explanation—or the most nearly

<sup>5</sup> Moskedal and Johnstone. To be published.

<sup>1</sup> Schnarf, "Handbuch der Pflanzenanatomie." Lief. 30 (Band X<sub>2</sub>). S. 211. 1933.

<sup>2</sup> Clare and Johnstone, *Amer. Jour. Bot.* 18: 674-83, 1931.

<sup>3</sup> Toumey, *Bot. Gaz.*, 76: 426, 1923.

<sup>4</sup> Jacobs, *Jour. Forestry*, 22: 573-574, 1925.

true—began with Lamarck as an intuition, became a conviction, and, unsupported by proofs such as we could give to-day, went down in apparent defeat. No one fails so completely as a genius" (p. 185).

Leaving Europe, we now come to chapters on the early American naturalists; Bartram and Michaux, the botanists; Wilson and Audubon, the ornithologists; Say and Lesueur, and that singular character Rafinesque. There is then an account of Goethe and the Romanticists, a quite full account of Darwin and Wallace and a final chapter on Fabre. Agassiz is omitted, "because most of what he stood for in natural history had already been expressed by Cuvier."

It is a charming book, certain to do a great deal of good. There should, however, be a somewhat revised edition. Peattie's emotional impulse, the very intensity of his convictions, sometimes leads him astray. He seems like a man on a splendid horse, riding in hot haste to a certain goal, sometimes careless of what is trampled under foot on the way. Thus (p. 298) "For the East Indies are the isles of five times ten thousand beetles, the country of the gorilla, the archipelago of birds of paradise, each species with an island to itself." Or (p. 292) "It was the 'Brownian Movement,' the spontaneous streaming of protoplasm, as disturbing for human eyes to see as the procession of the suns of space across a telescopic field, and fraught, as much, with human destiny." Or (p. 318) "But Father Gregor, superior of an Austrian monastery, was working his marvelous sweet-pea plot all unknown to the world of science." Some of the statements about Rafinesque are fantastically extravagant: "Amongst all the naturalists who have ever worked on the American continent, Rafinesque is the only one who might clearly be called a titan" (p. 263). "If the rules of priority were strictly and justly applied, Rafinesque would be found to have antedated a large part of the work of Say amongst shells, of his enemy Harlan amongst mammals, in botany of Gray and De Candolle." (p. 266.) A curious point has to do with "the deep roar of the gorilla" (p. 164). This appears

to be traditional,<sup>1</sup> but last year I spent considerable time watching the two gorillas (the mountain form, from the region near Lake Kivu) in the zoological gardens at San Diego. They are in robust health, and play together a great deal, running and wrestling. They make a noise by beating the chest, clapping the hands and beating rapidly on an iron door. They seem not to be vocal at all, under ordinary circumstances, but Mr. B. J. Benchley, the superintendent, tells me that they will occasionally utter a sort of scream under stress. They were tested with different kinds of music, and it was found that they were interested in anything of the nature of a drum, but wind or string instruments had no meaning for them. They pay no attention to the gibbon in the next cage, which sits on its perch and cries like a lost soul, just as I heard the gibbons crying in the tree-tops at dawn in Siam.

The illustrations in Peattie's book are of necessity those already familiar elsewhere, but they are well chosen and most excellently reproduced.

It is interesting to think how the historian, after many years, can perceive the significance or interest of events which could not be so understood when they happened. Peattie gives a figure of the *Franklinia*, a beautiful plant related to the camellia, discovered by Bartram in Georgia in the latter part of the eighteenth century. It still exists in cultivation, but how was Bartram to know that he had found the last wild specimen of a species on the point of extinction, a species which, but for him, would never have been known to man? When Say, in the far west, found the oval striped beetle which we call *Leptinotarsa decemlineata* (Say), he could not tell that eventually it would be known as a major pest of potatoes and related plants, of tremendous importance to mankind. It is for the historian to relate the present to the past, and so far as the naturalists are concerned, work of the type of Peattie's can be extended almost indefinitely.

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## SPECIAL ARTICLES

### THE REGENERATION OF VISUAL PURPLE IN SOLUTION

IN 1878 Kühne<sup>1</sup> reported that visual purple in solution, after being bleached by light, will regenerate some of its color in the dark. To our knowledge this observation has never been confirmed, though it is commonly known that most investigators concerned

with visual purple have vainly tried to repeat it. In fact, many of the published measurements with visual purple depend on the fact that a bleached solution remains constant and does not change in color. We wish to report that not only have we been able to confirm Kühne's observation, but that we have learned to specify some of the conditions controlling the regeneration of visual purple *in vitro*, and have measured its kinetics; and in addition have critically established the

<sup>1</sup> A. Ewald and W. Kühne, *Untersuchungen aus dem physiologischen Institut der Universität Heidelberg*, 1: 267, 1878.

<sup>1</sup> See, for instance, Flower and Lydekker, "Introduction to the Study of Mammals," p. 736.