Hence it was considered that Krakatoa presented an exceedingly rare opportunity for tracing the colonization of new soil by living beings.

Backer, who has been interested in the problem for many years, having studied the new vegetation on the spot as long ago as 1908, now comes forward with a critical review of all the work that has been done on the "new" flora.

As, unfortunately, so often happens in the progress of science, Backer now finds that the observations of the first years upon which all subsequent work must be predicated were neither exact enough nor extended enough to support the conclusions that have been built upon them. Treub and the other early workers apparently assumed, without considering it necessary to examine thoroughly, that so violent an eruption must necessarily have destroyed all vegetation and left the island sterile throughout. Certainly they did not explore all parts of the island or even representative habitats of all sorts but confined their attention to relatively small areas in the lowland. And certainly they did not submit any detailed data supporting their assertions of complete sterilization.

Backer now points out a number of circumstances which make it seem probable that the new vegetation consisted largely of holdovers rather than entirely of immigrants.

His reasons for this conclusion are three:

(1) The hot ejecta never accumulated on the steeper parts of the island but rolled off to the flats leaving the slopes relatively little injured.

(2) Plants large enough to be observed from the deck of a ship were seen on the slopes within three years after the eruption. (These were not examined close up and it was many years before the volcano was actually ascended.)

(3) While the flora of the strand demonstrably consisted of water-borne pioneers, the flora of the heights was of very different complexion. No careful studies have ever been made to determine its origin.

The ferns which played an important part in the colonization of the lowland back of the strand may, Backer thinks, quite as likely have come from adjacent cliffs as from a distance.

As to the probable weight of Backer's criticism the reviewer may add that his own experience at Katmai showed that the most careful investigation is necessary before it may be safely concluded that a volcanic territory has been completely sterilized. In Katmai Valley abundant plants of many species came up from old roots in places which had been buried under several feet of ash for three years and were later cleared by flood waters. One such habitat was found well up the slopes of the volcano and others at its foot. Certainly we would not have believed it possible for plants to survive under such conditions if we had not demonstrated it. In view of the similarity in character of the two eruptions it would seem likely that plants also survived here and there on Krakatoa.

As a result of his critique Backer concludes:

(1) It is not at all proved that by the eruption of 1883 all vegetable life on Krakatoa was destroyed.

(2) Even if this could be proved, we know—with the exception of the littoral flora—nothing at all about the manner in which the new vegetation has appeared. Only guesses without scientific value have been made but no reliable observations or experiments.

(3) Therefore, the Krakatoa problem can neither now nor in the future either be proved or solved and is of no importance at all for botanical science.

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Die Biologie der Moore. By O. HARNISCH. Bd. VII of Thienemann's Binnengewässer, 1929, 146 pp., 3 pl., 30 figs. Published by E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart.

A MOOR is defined as a continuous tract of land from whose moisture-loving plants there is forming (a living moor) or has formed (a dead moor), under the influence of terrestrial or telluric water, a massive accumulation of decomposition products rich in carbon. European moors have been studied extensively during the past two decades, and a considerable volume of literature dealing with this field of science has been published. The present volume gives a good résumé of the more important results contained in these publications. The ecological phases of the subject are especially emphasized.

Moors are discussed under two general heads, (1) as habitats and (2) the plant and animal societies that are found therein. The character of a moor as a habitat is determined largely by the character of the water supply; that is, whether the water holds a large or a small amount of mineral salts in solution which will serve as plant food material. The quantity of salts, in turn, is dependent upon the character of the rocks with which the water has come into contact. The amount of salts also determines whether the moor is eutrophic or oligotrophic. The abundance of the water supply, the temperature, the light intensity and the hydrogen-ion concentration are important factors also. By means of the method of pollen analysis the history of a moor from the time of its formation to its present stage may be ascertained.

Under life societies, the author takes up first the life of the ponds and pools that occur in moors. The algae, protozoa, rotifers and crustacea of the open waters are considered as well as the bottom fauna. The population is made up of ubiquitous forms and of those that are rather closely restricted to habitats of this character.

The moss turf usually holds a great deal of water which is well populated with a great variety of characteristic forms of algae, rhizopods, Turbellaria, rotifers and nematodes. In high moors the population is much smaller and the variety of organisms is rather limited. There is also a characteristic air-breathing fauna which shows considerable variation in composition in the different kinds of moors.

A bibliography of 178 titles is given.

C. JUDAY

WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY

Icones Plantarum Sinicarum. By H. H. HU and W. Y. CHUN. Fasc. 2, pp. 1–50, pl. 51–100. The Commercial Press, Shanghai, 1929.

THIS folio work prepared under the auspices of the Science Society of China and the department of botany, National Central University, Nanking, reflects distinct credit on both the authors and the publishers. Detailed descriptions in both English and Chinese of fifty indigenous species, together with important synonyms, geographic distribution, etc., are given. The figures, drawn natural size with enlarged details of the essential parts, are well executed and graphically represent the several species, many of which are here figured for the first time. The work is one that should be consulted by all botanists interested in the Chinese flora and in the preparation of monographic treatises.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

CHART ILLUSTRATING THE HISTORY OF BIOCHEMISTRY AND PHYSIOLOGY

MAY I be permitted to call the attention of the readers of SCIENCE to a recently published chart dealing with the history of the twin sciences of physiology and biochemistry?

This chart, which has been reproduced from the original by a lithographic process, gives a two-dimensional account of the historical development of these and cognate sciences. The arrangement is that of a graph, the vertical scale being in years and running from 1450 to 1900 with ten-year intervals marked off by horizontal lines. The lives of individual investigators are represented by continuous vertical lines beginning at the date of birth and ending at the date of death. Beside each such line is the name of the investigator in capital letters, with special signs indicating the university in which he was professor or the town where he worked. The vertical divisions group the investigators into anatomists, physiologists, biochemists, chemists, zoologists and philosophers. Diagonal wavy or dotted lines indicate relationships, controversies and succession in professorial chairs, and in this way also the main streams of intellectual influence are shown. At the date of publication of an important book or memoir, a thin horizontal line leaves the life-line of the investigator in question and leads to the title followed by a short description of the book. In addition to these descriptions there are quotations and notes interspersed throughout. In order to give an idea of contemporary events, the lives of men not biologists are shown in a separate column, *e.g.*, Galileo, Cervantes, Montaigne, Erasmus, Browne. Certain wars are also represented by vertical lines; the founding of associations such as the Royal Society is marked, and the beginnings of scientific journals noted. Before 1450 there is no regular time-scale, but the achievements of classical antiquity, the Hellenistic age and the dark ages are briefly referred to. The chart may be said to give a wide and detailed survey of the history of biochemistry and physiology, but its interest for biologists in general is considerable, as before 1800 the fields of study were not clearly differentiated, and until then the chart is practically a history of biology as a whole.

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FIXING THIN BLOOD SMEARS FOR STAINING WITH IRON HEMOTOXYLIN AND WITH GIEMSA'S STAIN

THE writer was unable to make satisfactory iron-hematoxylin preparations of blood smears that were fixed by the methods commonly in use because the erythrocytes retained this stain very tenaciously and, when they were finally destained, the chromatin of intracellular blood parasites was found to be likewise destained. The following modifications of well-known methods have, however, been made with success. Thin smears were dried in the same way as for Giemsa's preparations and fixation was completed by immersion in Schaudinn's alcoholic sublimate solution without acetic acid. The erythrocytes did not then take the hematoxylin, whereas the intracellular blood para-