the fruit is quite small. The epidermis of the fruit around the calyx end becomes shiny and tight in appearance. Coincident with these manifestations, the calyx lobes are forced out so that they appear to be set on top of a "peak." As the fruit develops the calyx end either turns black, involving the epidermis as well as the flesh, or else it becomes very hard and gritty. In either case the fruit finds no commercial value.

A canvass of the state pear sections the past summer showed that in practically every case where the abnormal fruit was developed the Bartlett was growing on the Japanese root, *Pyrus serotina,* and in only a few scattered cases on the French root, *Pyrus communis.* The latter were found where the trees were growing in soils that were very heavy and wet for a considerable length of time. As far as the one season's work is concerned, it appears as though there is a relation between the development of the abnormal fruit and the rootstock being used.

In addition to the rootstock studies mentioned above histological studies of the fruit have been undertaken in order to determine whether any structural changes occur in the abnormal as compared with the normal fruit. Also, experimental work is under way along control lines.

M. J. HEPPNER

DIVISION OF POMOLOGY,
COLLEGE OF AGRICULTURE,
DAVIS, CALIFORNIA

SCIENTIFIC BOOKS

Man and Weather. By ALEXANDER MCADIE. Cambridge, The Harvard University Press, 1926. 99 p., 19 illus.

THERE is so much good in the best of it, but so much bad in the worst of it, that this latest little book by McAdie left the reviewer depressed. The trouble seems to be this: Here is an author whose leaning toward the popular presentation of science is being almost constantly demonstrated, who nevertheless seems in this book not thoroughly careful as to how he goes about it. In fact, one is in some quandary over deciding what effect McAdie really wanted to produce in the minds of his hearers (the book is "essentially a series of lectures delivered in the Lowell Institute Course in December, 1924"). For on page 21, in the chapter on "Weather in Peace," he reminds them of the benefits to be derived if we could but forecast the character of the weather far ahead, and then, as on pages 27 and 28, says: " . . . It does appear that it is now possible to forecast periods of excessive rainfall and on the other hand droughts."

" . . . it is not difficult to forecast scanty rainfall and the absence of floods. As mentioned above, the month of March, 1915, ushered in a period of scanty rains which continued until midsummer . . . Or take another illustration . . . the drought of 1921 in northwestern Europe, which resulted in less than half a normal rainfall." The shortening of sentences in these quotations in no wise increases the effect of the author's words as an implication that conditions in March, 1915, or those preceding the drought of 1921 *foreshadowed* the coming droughts.

There is no other interpretation of the words than that the meteorologist's dream of being able to make satisfactory long-range forecasts has come true. And there is nothing of which the meteorologist is more keenly aware than that the dream has *not* come true. To be sure, in India, the comparative simplicity of the factors which affect seasonal rainfall in that country has made possible a fair degree of success in seasonal forecasting. For parts of California also, there seems to be evidence that we are on the eve of attaining similar success. But that is no justification for leading the non-meteorological public to infer far more than the most sanguine meteorologist dares to, on the basis of his present knowledge.

In the chapter on "Drought, Floods and Forecasts" the lecturer (referring to the California rainy season) again similarly confuses hindsight with foresight, thus, on page 97, "When the continental hyperbar is displaced to the northwest, the general drift of surface air being from northeast, the winter *will be* (reviewer's italics) dry."

Quite so, if you change that careless *will be* to *is.* So also with a statement of conditions favoring on the one hand heavy, and on the other hand deficient, precipitation. The thing reads as if we could predict, on the basis of current pressure conditions in the autumn, what the pressure conditions and therefore the rainfall are to be, in the winter. No one is in a position to forecast, for California or any other part of the country, the distribution of atmospheric pressure even a week ahead, to say nothing of a month or a season. Yet here is long-range forecasting advertised by the Abbott Lawrence Rotch professor of meteorology in Harvard University and the director of Blue Hill Observatory, as a *fait accompli.* One may reverently hope that the shade of Rotch was not present at those lectures.

We note the seemingly inevitable illustration from the "Tower of the Winds"; some good cloud pictures scattered in no discoverable relation to the text; a picture of a "Cumulo-stratus," the term being obsolete in cloud classification; the repetition, in a chapter on "The Strategy of Weather in War," of material from an earlier, delightful book by the same author;

and the persisting effort to urge certain changes of terminology upon an unwilling science. With respect to this last item, the reviewer hopes, however, that some day meteorology will no longer remain unwilling to adopt McAdie's "hyperbar" and "infrabar."

Let it be clearly said that the general reader will discover in this book much to interest and inform him, a very great deal that is most attractively written, occasionally a little masterpiece. He will, it must be pointed out, feel that the going is sometimes a little uneven, for there are bumps of technical matter by no means adequately smoothed out for the layman. Some of these are probably beyond legitimate smoothing for a book of this kind; they would better be omitted altogether. But the recommendation is emphatically to read "Man and Weather," nevertheless.

BURTON M. VARNEY

WASHINGTON, D. C.

Nomenclator animalium generum et subgenerum. Published by the Prussian Academy of Sciences, Berlin.

THE plan of this work traces back more than twenty years. Franz Eilhard Schulze, the editor of "Das Tierreich," also formed the original plan for this comprehensive index of the correct names of the genera and subgenera of the animal kingdom. After his death, W. Kükenthal became the editor and at the present time it is continued by K. Heider as editor and Th. Kuhlgatz as responsible manager. The work will not only enumerate all the names of the genera and subgenera including the paleontological names, but as far as possible will give for them the exact reference of their first employment. Since it was the original plan not to go beyond the literature of 1909, these detailed statements are given only for those names which came into use previous to this date. For all the names that originated from 1910 through 1922 the references of the *Zoological Record* will be given. Most of the subdivisions have been worked out by specialists, the bureau of the "Nomenclator Commission" of the Prussian Academy of Sciences directly taking care of the few remaining fields for which specialists could not be found.

Doubtless this work, of which four issues have left the press, will prove to be of greatest usefulness to workers in all fields of zoology, and one can but admire the great amount of prosaic work necessary to accomplish it. The entire work will comprise five volumes, each of which will be published in five issues. Subscriptions are to be sent to the Preussische Akademie der Wissenschaften, Unter den Linden 38, Berlin NW 7. The subscription price is 15 marks for every issue (160 pages, approximately) and will change to 20 marks after March 31 of this year.

WALTER LANDAUER

SPECIAL ARTICLES

THE INFLUENCE OF SELECTIVE AND GENERAL IRRADIATION BY A QUARTZ MERCURY ARC LAMP UPON THE GERMINATION AND GROWTH OF SEEDS

DURING the last few months we have been conducting experiments (1) to determine the effects produced upon the germination and growth of seeds by selective irradiation as obtained by the use of filters which screened out, by progressive steps, the various portions of the ultraviolet radiation from a quartz mercury-arc lamp and (2) to determine the daily growth of various seedlings when irradiated from one, two, five and ten minutes, respectively, under the same lamp, and when grown in darkness or under subdued daylight as transmitted by ordinary window glass. The experimental conditions were maintained as uniformly as possible with reference to temperature, moisture, character of containing vessels and methods of handling seedlings. An air-cooled quartz mercury lamp of the Victor X-ray Corporation type was operated at 70 volts and was used at a distance of 50 cm. The lamp was standardized and found to produce a grade 1 reaction (transient erythema) of the normally unexposed skin of the upper arm in three minutes at a distance of 50 cm and a grade 2 reaction (permanent erythema) in six minutes.

SELECTIVE IRRADIATION

Table I contains a sample set of data obtained on the germination and growth of cucumber seedlings; the character of the irradiation, the periods of exposure to the quartz mercury lamp, and the subsequent disposition of the seedlings (that is, whether kept in the subdued daylight of the room or in darkness) are also given.

The conclusions which we believe we are justified in drawing are:

(1) Selective irradiation of the seed modifies the time of its germination and rate of its subsequent growth.

(2) The lesser wavelengths, in general, appear to stimulate while the greater wavelengths inhibit germination.

(3) Wavelengths ranging from about 320 mμ to 390mμ seem particularly effective in inducing growth.

(4) Wavelengths of 270 mμ to 320 mμ appear to be inhibitory in their action, and delay the time and lessen the rate of growth, probably because of changes