suggests their need of a very long daily light period as occurs in England and Alaska during the growing season.

Among the new varieties originated by the U. S. Department of Agriculture, U.S.D.A. No. 659 has been found especially well adapted to North Carolina where it is as early as Missionary, one of the leading commercial varieties of that state. When grown in the greenhouse in midwinter, with the daily light period increased by electric lights it responds even more quickly than Missionary. This suggests a better adaptation than Missionary to southern conditions where the spring growth occurs under short days. Other selections resulting from breeding work tested under increased daily illumination in midwinter have shown widely different responses, some corresponding to that of Missionary and others to that of such varieties as Howard 17.

Because the daily light period and the amount of light received in a day varies so widely for the different parts of the winter and because strawberry varieties respond so characteristically to additional light, results obtained at different times during the winter may be quite different, yet afford valuable data in helping to understand the normal varietal behavior in the field where most successfully grown. The response of about 140 sorts suggests the possibility of a classification of new originations and introductions on the basis of their rest periods, their response to temperature and to additional light as a first step in determining their regional adaptation.

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THE PRECISE EXPRESSION OF "DRYNESS"

IN referring to the viability of algal resting cells over long periods under comparatively dry conditions, Otis[1] has given an example of the need, in a great variety of comparative studies, of an exact method of expressing moisture conditions or degrees of dryness so that different observations may be correlated. Otis mentions a reported case of algae living for seventy years in stored soils containing from 3 to 10 per cent. of moisture. These quantities mean nothing without a knowledge of the type of soil involved, but probably imply enough "free" water in the soils so that the resistance to drying of the algal cells was not taxed in the slightest; in fact it is conceivable that the cytoplasm might never have been strictly dormant during all this period as conditioned by dryness. On the other hand the same author refers to a medium of small twigs, needles and rock fragments, on which algae are at present being stored, which is "very dry." It undoubtedly makes a good deal of difference to these algae whether the medium was "dried," and is now being held, in an atmosphere of 30 per cent. or one of 90 per cent. relative humidity. It is an accepted principle that the algae, the rough material, and the atmosphere of the storage jar must be, after a short time, in vapor-pressure equilibrium; it is, therefore, a perfectly simple matter to express the moisture condition of the entire system, in such a case, in concrete terms, of which the relative humidity at any moderate temperature is the simplest. It is also a simple matter to measure the state of the system for such an expression by placing weighed samples of the material in desiccators whose relative humidities have been predetermined by placing in their lower chambers various mixtures of water and sulphuric acid, or other chemicals. The gain or loss of weight by the sample indicates its position in the scale with all the precision necessary, provided the different desiccators vary in their humidities by steps of not more than 10 per cent. The method gives a reference point for moisture conditions on a great variety of materials whose physical properties vary so widely that direct comparisons of "moisture contents" are meaningless or impossible. It is, of course, not directly useful for materials whose moisture condition is above the lower limit of "free" water, for example, wood above the fiber-sat. point, or soils above the "wilting coefficient."

The writer has found in studying the viability of coniferous tree seeds that "air-dry" is entirely too indefinite an expression for indicating the status of seeds placed in storage. Depending upon the weather conditions, the presence of artificial heat indoors, etc., this term might mean drying to equilibrium with atmospheres of 60 per cent. or of 20 per cent. relative humidity, which in turn might mean the difference between 5 per cent. and 3 per cent. moisture content of the seed itself. With at least one species, a critical condition of dryness, affecting viability within a short time, appears to be reached at equilibrium with about 25 per cent. relative humidity. At least, small differences in this region may be of considerable importance. Hence the need for a precise method both of controlling and of expressing the condition in living materials.

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THE STONING OF A MINOR PROPHET

THE intuition of poet or artist has on occasion been responsible for significant predictions in the

[1] Chas. H. Otis, "The Viability of Algae," SCIENCE, N. S., 68: 1754, August 10, 1928.

field of science. For obvious reasons, prediction to be orthodox must come from competent, not to say prominent, men of science. The prediction described below appears somewhat difficult to classify as either artistic or orthodox, but seems worthy of record.

During the winter of 1878–9 a rough Pennsylvania mountain school teacher, aged about fifty, ventured to express his belief in the coming of wireless telegraphy. For this he was mercilessly rebuked by one of the most distinguished physicists of America, then a man in his late thirties. This incident, described below in the words of an eye-witness, is all the more interesting because the physicist was a man of lively mind and intense natural curiosity. The eye-witness is an early graduate of Mount Holyoke.

It was the winter of 1878–9. The Teachers' Institute of Fayette County, Pennsylvania, was meeting at Uniontown in the courthouse.

Public-school teachers from all over the county—big towns, small towns, rich farming sections and mountain districts—were present.

This week's break in the routine teaching—the week between Christmas and New Year's—was an unusual opportunity for these teachers. There were sure to be on the program a few real celebrities—scientific, literary, musical and what-not.

In this particular year, Dr. ———— was the great light.

One of his talks was on telegraphy—the Atlantic cable and the marvelous achievements of Morse and Fields. At the close, opportunity was given for questions.

In the far corner of the court-room there arose a red-headed, rather unkempt individual whom we recognized as a teacher of one of the mountain districts—a man of at least forty.

This was his question: "Professor, don't you think that the time is coming when messages will be sent without connecting horizontal wires? Perhaps with only upright wires at each station?"

The learned professor turned upon the mountaineer all the force of his polished sarcasm. It seemed to us who were breathless listeners that the mountaineer must be properly punished for even thinking such a preposterous and unscientific possibility.

When Dr. ———— had finished, the man who had remained standing throughout his tirade quietly remarked, "That's all right, Professor, but there are some folks in this room who will live to see just the thing that you say can't happen."

P. B. S.

SCIENTIFIC BOOKS

Conditioned Reflexes. An Investigation of the Physiological Activity of the Cerebral Cortex. By I. P. PAVLOV, director of physiological laboratories in the Russian Academy of Sciences and the Institute of Experimental Medicine. Translated and edited by G. V. ANREP, MD., D.Sc., lecturer in physiology in the University of Cambridge. Cloth. Price, $9.00. 430 pp. 18 illustrations. New York: Oxford University Press, 1927.

Lectures on Conditioned Reflexes. 35 Years of Objective Study of the Higher Nervous Activity (Behavior) of Animals. By IVAN PETROVITCH PAVLOV, M.D., director of the physiological laboratories, Institute of Experimental Medicine and Academy of Sciences; formerly professor of physiology, Military Medical Academy Leningrad. Translated from the Russian by W. HORSLEY GANTT, M.D., B.Sc., with the collaboration of G. VOLBORTH, M.D. 414 pp. Bibliography and index. Price, $6.50. International Publishers, New York. 1928.

WITHIN the short period of one year there has been rendered available for English-speaking people the monumental work of Pavlov and his pupils on conditioned reflexes. The Anrep translation comprises essentially a stenographic account of a series of lectures given by Pavlov at the Military Medical Academy of Petrograd. The Gantt translation consists essentially of a series of papers and addresses delivered by Pavlov before various medical and scientific organizations in different parts of the world during the last twenty-five years. The first book is a more systematic development of the experiments and interpretations of conditioned reflexes. The second book, although bearing the same title, is essentially a source book of experimental data in that here Pavlov gives somewhat more in detail the methods and results in the various experimental attacks.

Pavlov is universally recognized as the pathfinder in the field of nervous physiology and animal behavior now grouped under the term "conditioned reflexes." Conditioned reflexes are those reactions or behavior mechanisms developed after birth as a result of individual experience and learning or as a result of particular developmental stages of the individual as distinct from the simpler and less variable reflexes laid down in the structural relations of the individual and already perfected at birth. The problem of analysis and development of conditioned reflexes is therefore one of highest interest biologically, and of the highest practical importance in education and in the problems of social control. In Gantt's translation there is an interesting chapter dealing with the life of Professor Pavlov himself. This biographical sketch and the prefaces occupy the first forty-six pages of the book. The bibliography at the end of both translations contains citations of all publications on the subject of conditioned reflexes from Pavlov's own laboratory in Petrograd. It is interesting to note that practically all these publications appear un-