

ratus and galvanometers—by the men engaged in commercial testing because of the description of the methods suited to the needs and the good advice given in regard to the selection of apparatus for different kinds of work; by the instructor in our educational institutions because it constitutes a valuable reference book for him and his students; by the specialist because to him the author succeeds in a marked degree in giving the benefit of his wide experience in the design, construction, and use of resistance and electrical measuring apparatus.

FRANK WENNER

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*Metabolic Water: Its Production and Rôle in Vital Phenomena.* By S. M. BABCOCK. Research Bulletin No. 22, The University of Wisconsin Agricultural Experiment Station, March, 1912.

The purpose of the author in this paper of 181 pages is to show that metabolic water is not only produced in considerable quantity from the organic constituents of the foods and tissues of plants and animals by oxidation and hydration, but also that water from such sources exercises a different function from imbibed water, and that in very many cases is essential to the growth and continued life of the organism in question. The studies were conducted with corn plants for the most part. The studies from the zoological standpoint were not so extensive. The animals used were clothes moth (*Tinea pellionella*); bee moth (*Galleria mellonella*); pea weevil (*Bruchus quadri-maculatus*); flour beetle (*Tribolium confusum* and *Ephestia kuehniella*).

The scope of the study is indicated by the following selected headings taken from the table of contents: Sources of metabolic water (respiration, etc.); metabolic water in seeds; germination phenomena; metabolic water in mature plants; composition of plant tissues; development of hydrolytic ferments in seeds; imbibition; reserve nutrients in plants; water content of green and ripe fruits; intramolecular respiration; water produced in animal metabolism; water requirements of animals.

The author seems to have shown in a rather convincing manner that metabolic water plays an immensely important rôle in the life of both plants and animals. The paper contains many facts collected together in a form such that they should be interesting to every plant physiologist.

RAYMOND J. POOL

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*Fresh Air and How to Use It.* By THOMAS SPEES CARRINGTON, M.D. The National Association for the Study and Prevention of Tuberculosis. 1912.

This little book is timely and well conceived. It finds an enormous audience prepared to welcome it through sanitary precepts from press and platform for many years. Therefore the responsibility of the author is somewhat unique. One could wish that the execution of the work might deserve unqualified praise. Fortunately it should be easy for the author to correct such matters as call for adverse criticism.

We believe that it is better to be true than to be convincing. Our author's introduction needs rewriting, for it is founded on the old conception that the prime danger from "bad air" lies in its chemical composition. His effort to put a known good thing on a scientific basis suggests the abominable method of instruction by which many popular school physiologies have been perverted for the purpose of lambasting narcotic drugs and alcohol.

In spite of a vast amount of research we are still none too well informed as to the essential physiological relations of "pure" air.

But it seems to have been demonstrated that all *morbid sensations* attributable to "foul air" depend wholly upon the effects of combined humidity and heat upon the skin. *Moving* air—a breeze—accelerates heat loss from the body, stimulates the skin in other ways and brings subjective comfort. Now in nature moving air is found most easily in the open or at least in apartments exposed to the open. Sanitary architects—God save the mark—find their task in evolving intricacies of construction whose design it is to obviate