crasies of the individual or to temporary derangement of the metabolism giving rise to pathological states not recognizably associated with beriberi. To appraise this possibility we enlisted as medical associate Dr. Martin G. Vorhaus. Clinical trials have been made in polyneuritis of pregnancy, colitis, nutritional edema, gastro-intestinal atony, polyneuritis of undiagnosed origin, etc., as indicated in part elsewhere.[2] Study of these conditions is being extended with gratifying results.

Considerable evidence also exists as to a relationship between vitamin B_1 and carbohydrate metabolism.[3] In view of this the effect of the administration of large amounts of the pure vitamin in human diabetes is being studied. The early results are extremely interesting and give further evidence of the significance of B_1 in metabolism and its possible therapeutic use in cases of deranged carbohydrate utilization. When these results have more fully matured they will be reported by Dr. Vorhaus and collaborators through the usual medical channels.

We wish to express our gratitude for financial aid from the Carnegie Corporation through the Carnegie Institution of Washington.

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A PHYTOSTEROL AND PHYTOSTEROLIN FROM THE SWEET POTATO

DURING the process of isolation of carotene from the sweet potato *Ipomoea Batatas* Poir., a phytosterol and a phytosterol glucoside or phytosterolin were separated. Since these substances have not been previously reported from this source, it seems desirable to record them in the literature.

The phytosterolin was separated from a concentrated solution of the sweet potato pigment before saponification, and the phytosterol was removed from a concentrated extract of the material remaining unsaponified by alcoholic potassium hydroxide.

After repeated recrystallization of the crude phytosterolin from dilute pyridine it melted at 285° to 286° and gave an acetate melting at 165° to 165.5°. With careful manipulation a positive Salkowski sterol reaction and an alpha naphthol test for carbohydrate were obtained on the parent substance.

After two recrystallizations of the phytosterol from ethyl alcohol-ethyl acetate mixture it melted at 136.5° to 137° and gave both the Liebermann-Burchard and Salkowski reactions for sterols. On treatment with acetic anhydride an acetate was formed which melted at 129° to 129.5°.

From these data it is concluded that the phytosterol of the sweet potato consists chiefly of sitosterol and that the phytosterolin is a sitosterol glucoside.

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[2] Carnegie Inst. Year Book, No. 33, 297, 1934.

[3] M. Labbe, F. Nepveux and J. D. Gringoire, *Bull. Acad. Med.*, 109: 689, 1933; C. A. Mills, *Am. Jour. Med. Sci.*, 175: 376, 1928.

THE APPLICATION OF ARTIFICIALLY IONIZED AIR

IN the first volume of transactions from the Central Laboratory for Scientific Research on Ionification, entitled "Problems of Ionification," and edited by Professor A. L. Tchijevsky,[1] is presented an extensive review of the theory of ionization, the general biological influence of ionization on animals and the results of experimental ionization of chickens.

The ionization of air (or the accumulation of negatively charged particles in the air) has been done by the use of high-potential, 100,000 volts, 0.5 milliampere, frequency at least 3,000 cycles per second electric current, transformed from the original source of 110–220 volts D.C. This has been considered as one of the cheapest and the most convenient methods of artificial ionization of air on a large scale. There were produced from about 400,000 to 600,000 negatively charged particles per cm^3 (as compared with ordinary air, which has about 2,000) by brush discharge ("electrofluvial luster") from the negative electrode suspended from the ceiling at a distance of about $3\frac{3}{4}$ feet from the floor, or about 35 cm from the layer of treated eggs.

The experimental results on the influence of ionized air on the chicks and mature birds, as well as on the eggs during the incubation, though they were obtained under highly unfavorable experimental conditions and with a low quality of experimental material, in most cases were very significant and convincing.

On the basis of these experiments as well as in the consideration of the studies presented in Volumes II, III and IV, on other domesticated and wild animals, insects, bacteria, plants, seeds, etc., it was concluded that ionized air prevents weak individuals from early death, increases the growth of birds and their productiveness (egg laying), helps to assimilate food, increases general metabolism, raises physical activity, improves reproduction, favorably affects the composition of blood, increases the resistance of an organism and has preventive and therapeutic value in some diseases (such as avian tuberculosis). From these one can see a definite biological influence of ionized air,

[1] A. L. Tchijevsky, *et als.* "Problems of Ionification," 1: 1–487, Voronezh, U. S. S. R., 1933 (in Russian).

its prophylactic value, and possibly its wide application for promotion of the health, vigor and increase of economic value of birds, particularly under certain unfavorable climatic conditions or during winter months.

However, these results are far from final. At present it is even impossible to predict with appreciable accuracy the prophylactic, therapeutic or economic application of this method in poultry production. More thorough work under well-controlled conditions is needed towards the evaluation of the exact influence of other factors involved in this method of ionization of air, such as production of ozone, nitrous compounds and possibly thermal effect, presence of ultra-violet, x-rays, etc., and then the standardization of ionic concentration, doses and duration of exposure of birds of various ages and physical state of health.

In general, the initiative of Professor Tchijevsky and his co-workers is of significant biological interest. It may serve as an inspiration to those who wish to attack the problem and to get some definite and perhaps useful results. There are many possibilities, however, not only in animal production but in various fields of animal and plant economic biology. Moreover, it suggests a wide field of research in relation to medicine, preventive and curative.

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EXPERIMENTAL ADAPTATION OF FRESH-WATER CILIATES TO SEA WATER

YOCOM[1] maintains that he has not been able to find any record of an attempt to adapt fresh-water ciliates to sea water. He obviously overlooked Finley's paper. Finley[2] asserts that he tested fifty species of fresh-water protozoa and that he succeeded in adapting twenty of them, including *Paramecium aurelia* and *Paramecium caudatum*, to pure sea water, with no significant change in the morphology and only a "relatively slower pulsation of the contractile vacuoles."

I have repeated Finley's experiment several times, using *Paramecium caudatum* and *Paramecium multimicronucleatum*, but I was unable to confirm his contention. The animals always died when the concentration of sea water approached 40 per cent. There were also marked changes in the morphology of the animals, and there was a marked decrease in the frequency of the pulsations of the contractile vacuoles. I hope to publish a more detailed account of these experiments in the near future.

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DISTRIBUTION OF SEPARATES OF CERTAIN PAPERS BY THE LATE DR. BASHFORD DEAN

THERE have been placed in my hands, by Mrs. Bashford Dean, for distribution among students of fishes, certain reprints of Dr. Dean's studies on the archaic fishes, found among his effects after his untimely death.

If research men who are interested in the morphology, anatomy and embryology of the cyclostomes, sharks and ganoids will go through Dr. Dean's bibliography either in Vol. 1 of the "Bibliography of Fishes" or in Art. 1 of the Bashford Dean Memorial Volume, and will indicate to me what articles they desire, I will forward these so far as they are available.

It may be some time before the actual sending out can be done, but I should like to have all requests in before the distribution is begun.

E. W. GUDGER
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NEW YORK, N. Y.

SCIENTIFIC BOOKS

PRIMITIVE LAND PLANTS

Primitive Land Plants, also known as the Archegoniatae. By F. O. BOWER. Macmillan, London, xi + 658 pp. 465 ill. Price, $8.00.

PROFESSOR BOWER may be said to have devoted a long life of research chiefly to those plants collectively known as the Archegoniates, that is, to the mosses, liverworts, ferns and so-called fern-allies—the club-mosses and horsetails. Any intelligent person working in this field would naturally be much concerned with the beginnings of land floras, and Bower published "The Origin of a Land Flora" in 1908. Since then he has summarized his work on "The Ferns" in three important volumes (1923–1928) and formulated his ideas on "Size and Form in Plants" in a stimulating work (1930).

Meanwhile there has been a notable accumulation of additional facts regarding both living and fossil Archegoniates—especially the recognition of the Devonian group Psilophytales. These discoveries have served to draw together the Bryophyta, Pteridophyta, Lepidophyta and Arthrophyta, and, it seems to me, put an end for all time to notions that the earliest land plants were polyphletic transmigrants of Algae.

Bower now returns to the origin of land plants in

[1] Harry B. Yocom, *Biol. Bull.*, 67: 273–276, 1934.
[2] Harold Eugene Finley, *Ecology*, 11: 337–347, 1930.