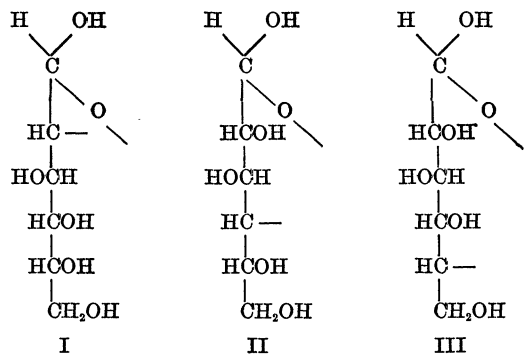
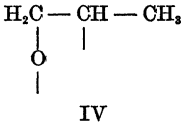


I II III

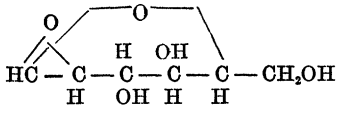
and of glycidol.[1] Each of these two substances shows a greater tendency towards condensation as well as towards intramolecular rearrangement than the corresponding alcohol. Furthermore, optically active propylene oxide was found to undergo Walden Inversion on hydrolysis with acids. This observation was interpreted to mean that in course of the reaction of hydrolysis of the oxide, the free radicle



IV

has for a finite, even though infinitesimal, interval of time an independent existence. From this assumption it would naturally follow that the reactivity of an oxide depends upon the stability of the ring structure and indeed <1, 3> and <1, 4> oxides were found more stable than the ethylene oxide structures. In application to sugars, this assumption would mean that those having the ring structure (I) should be more reactive than those with structure (II) and that those with structure (II) should be more reactive than those with structure (III).

Two independent significant communications have recently been published which bear on our theory. Gottschalk[2] has observed that α-glucosan, having the structure



V

and containing an ethylene oxidic ring, ferments at a higher velocity than ordinary glucose and Pictet[3] has found that the same glucosan readily condenses with glucose to form maltose. The reactivity of the α-glucosan is explained by our assumption of the formation of a radicle with free valences on carbon atoms (1) and (2). Thus, these communications furnish additional evidence in favor of our assumption.

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[1] Levene, P. A., and Walti, A., *J. Biol. Chem.* 73, 263, 1927; 75, 325, 1927.

[2] Gottschalk, A., *Z. physiol. Chem.* 170, 23, 1927.

[3] Pictet, A., and Vogel, H., Helv. Chim. Acta 10, 588, 1927.

THE STEPHEN HALES PRIZE FUND OF THE AMERICAN SOCIETY OF PLANT PHYSIOLOGISTS

THE year now ending is the two hundred and fiftieth anniversary of the birth of Stephen Hales and it is just two hundred years since the publication of his best known book, "Vegetable Staticks." Now is therefore a most appropriate time to commemorate the life and works of Hales, and the American Society of Plant Physiologists is planning a Stephen Hales session as an attractive feature of its approaching annual meeting in Nashville. At that session will be officially established the Stephen Hales Prize Fund, an endowment fund that is being accumulated in the form of personal subscription by members of the society. The endowment is to be administered as a perpetual trust by the American Society of Plant Physiologists. The income therefrom is to be devoted to prizes in plant physiology, which are to be awarded by the society from time to time. Subscriptions already in hand make it certain that an award of fifty dollars can be made every two years, but the amount of each prize may be increased or the award may become an annual occurrence as soon as such changes become possible. The prize is to be known as the Stephen Hales Prize in Plant Physiology.

The establishment of this prize will certainly mark a definite forward step, it will surely become a milestone in the progress of the botanical aspect of physiological science. In the first place, it will aid in perpetuating the memory of the great pioneer experimenter whose name the prize bears, whose work looms so large in the historical background of plant physiology. Also, the establishment of this prize may tend to emphasize plant physiology as a science, implying its close relation to the other branches of physiology and perhaps offsetting in some degree a noticeable tendency for present writers to allow this particular branch of fundamental knowledge to become indistinct as such, masked or even lost among its numerous and rapidly increasing applications in plant culture and sometimes overshadowed in its basic relations to descriptive morphology and phylogenetic and genetic botany. And the awards themselves may stimulate research

to some extent, and the presentation of the results of research. Furthermore, in inaugurating the Stephen Hales Prize, the Society of Plant Physiologists will provide a means whereby, from time to time, an excellent contribution in plant physiology may be appropriately signalized as exemplary for its period. As the number of papers thus distinguished grows, the younger investigators in this science may turn to them as models. Finally, each award will constitute a democratic expression of approval and appreciation by the colleagues of the investigator thus honored, and the honor of being selected for the Stephen Hales Prize will surely come to be highly valued. Such considerations as these are in the minds of those who are taking part in this cooperative project.

Persons who desire to take part in the foundation of the Stephen Hales Prize Fund should send contributions at once to Professor Charles A. Shull, Department of Botany, The University of Chicago, making checks payable to American Society of Plant Physiologists, Hales Fund. Contributions of any size will be accepted and greatly appreciated by the society. To make the best showing in the records it is highly desirable that a very large number of American plant physiologists should take part in this foundation.

The name of Stephen Hales occupies a very important place in the history of plant physiology, but his was a mind of very broad interests and he made great contributions in many other fields as well. His earliest botanical studies were made afield, in the region about Cambridge, where he collected specimens and catalogued them with the aid of Ray's *Catalogus plantarum*. He was elected to the Royal Society of London at the age of forty and soon made his first communication to that society, on the effects of the sun's warmth in raising the sap in trees. Encouraged by the great appreciation with which this contribution was received, he continued his experimental work along this line and ten years later published his famous book on "Vegetable Staticks."

Hales was curate of Teddington, near London, from 1708 until his death in 1761, at the age of eighty-four. He was interested in nearly all phases of the science of his time. He made the first important contributions to our knowledge of blood pressure and won the Copley medal for studies on bladder and kidney stones. He turned his inventive genius toward practical problems of human welfare. Among his inventions were ventilating devices for use in mines, hospitals, prisons, ship holds, granaries and the like. In his later years he became interested in the ventilation of heated melon frames and greenhouses.

Among students of plant physiology Stephen Hales will always be known especially for his ten years of experimental study of the intake and movement of water in plants. This was the first scientific investigation of one of the major processes of plant life.

CHARLES A. SHULL,
BURTON E. LIVINGSTON

LOSSES IN TROUT FRY AFTER DISTRIBUTION

I HAVE been asked to reply to some objections which have been urged against Mr. White's (seining) method of determining trout fry losses after distribution.

1. The traps maintained at each end of the area over which it was expected the fry might spread evidently gave them ample range. For example, the upper boundary on Forbes' brook was an impassable mill dam; the lower boundary was a wire screen and trap which caught only one hundred and two fry, and this trap was located only thirty-three rods below where the main body of fry (4,020) were deposited. *Fry have a tendency to stay near the point of planting.*

2. That débris is caught on the upper boundary screen is perfectly true, and if allowed to accumulate would obstruct the floating food which comes down stream; but débris was always carefully, regularly and frequently removed.

3. "Fry play hide and seek with the seiners and are often, after the seining is over, counted as dead when they are in reality only hiding."

There is not the slightest doubt that the percentage of missing fry (71 per cent. to 100 per cent.) quoted in White's reports can always be obtained in the vicinity of many places where fry had been planted by dumping them in large numbers. Now that the folly of this practice has been exposed, and that distribution is taking the place of dumping, there may be an increase of survivals.

4. No injury was inflicted upon the fry or fingerlings while they were confined in the observation compartments—either small or large—on Forbes' brook. They were on shorter rations, of course, but this must be a common experience in fish life, if not an everyday occurrence.

5. Contrast Mr. White's experiments with those of Professor Frederic Lee (of Columbia University) on dog fish in 1888–89, at the Woods Hole laboratory. The former did no injury to the trout; the latter cut open the skull and stimulated the inner ear in order to demonstrate the functions. (And he was justified in doing so.) In this injured condition the dog fish were kept alive for days at a time. Yet no scientist ever objected to the validity of Lee's conclusions. Indeed, if the objections to White's seining experiments are held to invalidate his investigations then a vast amount of outstanding research in experimental zoology and physiology by some of the best biologists in America will have to be discarded.