stream, and with the aid of a large reading-glass attached to a pole, it was possible to see the feeding movements of the mouth-parts. Several observations were recorded later than this of specimens of *Gerris remigis* sucking the juices of these berries. Only on one other occasion was *Gerris marginatus* seen to use this fruit as food. The plant from which these fruits came is commonly known as the coral-berry or Indian currant, *Symphoricarpos vulgaris*. It is very common along the banks of the brook near Whiteheath.

I have found that, during my observations of the food habits of water-striders in captivity, while confined in aquaria, both species mentioned suck the juices of freshly killed *Physa* and *Planorbis*. They also feed on fresh beef, on the soft parts of banana fruit, and on the inner, softer parts of the skin.

These observations seem to add additional evidence to Hungerford's[11] contention that aquatic Hemiptera are neither entirely predacious, nor do they feed entirely upon insects. It is very likely that other observers could report further observations of the character that have been recorded here.

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SCIENTIFIC BOOKS

Wild Animals of North America: Intimate Studies of Big and Little Creatures of the Mammal Kingdom. By EDWARD W. NELSON. Natural-Color Portraits from Paintings by LOUIS AGASSIZ FUERTES. Track Sketches by ERNEST THOMPSON SETON. Published by the National Geographic Society, Washington, D. C., U. S. A.; 8vo, pp. + 385–612, folded frontispiece, 108 colored illustrations on text paper (not plates), 85 halftone illustrations. [This is essentially a reprint of two articles which appeared in the *National Geographic Magazine*, for November, 1916, and May, 1918. The changes comprise repaging beyond page 472, the readjustment of the matter on pages 473–475, the replacement of a half-tone on page 475, the rectification of page references to illustrations to accord with the new paging where needed, and readjustment of the matter from page 571 on, so as to admit 32 new illustrations of footprints and the captions to these.]

This is a work which meets to a gratifying degree the need for an essentially non-technical treatise upon the natural history of the mammals of North America. No living person is better equipped to carry to a successful conclusion such an undertaking than is its author. Nelson has contributed in the field of vertebrate zoology now for over forty years, to be explicit, beginning in July, 1876 (*Bulletin Nuttall Ornithological Club,* Vol. 1, p. 39). With a background of long experience in the field, and with further years of official connection with the United States Biological Survey and its unique resources in mammalogy, he has made available a brochure of pleasing amplitude and satisfying authoritativeness.

Between the colored pictures and the written sketches the public can gain from this contribution a better idea of our principal mammals than from any other available publication. It should awaken a generally greater interest in our native mammals, and this will help build up a desire for the conservation of the harmless and useful species such as has resulted from the public education in relation to our bird life. On the other hand it is important to be able to distinguish those mammals, chiefly of the order Rodentia, which are thoroughly inimical to human interests. People at large must know how to cope with these enemies. It would seem that a full knowledge of the natural history of such animals is essential to determining the most successful means of controlling them and to applying these means properly to the varying conditions throughout the country. Nelson's accounts of our injurious mammals are full of stimulative suggestions along these lines, and while the work as a whole can not be considered as an "economic" publication, its influence will go far to secure adequate popular consideration of these matters.

[11] *Loc. cit.*, pp. 336–337.

The species are taken up in groups, in so far as this can be done safely. Each biography, of which there are 119, is, as a rule, a composite applying to a number of near-related forms, thus simplifying matters of presentation, and avoiding repetition. A marked feature of the book is the degree of concentration attained; there is no trace of padding, and no room for baseless speculation, sentimentalizing or humanizing, such as characterize many current "nature" books. At the same time the style is animated and thoroughly entertaining, a gift of composition which Nelson has exercised in many preceding contributions. Here is an instance, unfortunately a rare one, in which a man who really knows the field has put out a popular book on a natural history subject.

Many are the portrayals which are evidently based on Nelson's own personal field knowledge, some of them involving facts here for the first time made known to science. His account of the behavior of kangaroo rats in Lower California is particularly apt in illustration of the above statement.

> During several nights I passed hours watching at close range the habits of these curious animals. As I sat quietly on a mess box in their midst . . . [they] would forage all about with swift gliding movements, repeatedly running across my bare feet. Any sudden movement startled them and all would dart away for a moment, but quickly return. . . . They were so intent on the food [grains of rice put out for them] that at times I had no difficulty in reaching slowly down and closing my hand over their backs. I did this dozens of times, and after a slight struggle they always became quiet until again placed on the ground, when they at once renewed their search for food as though no interruption had occurred. . . . While occupied in this rivalry for food they became surprisingly pugnacious. If one was working at the rice pile and another rat or a pocket mouse approached, it immediately darted at the intruder and drove it away. The mode of attack was to rush at an intruder and, leaping upon its back, give a vigorous downward kick with its strong hind feet. . . . Sometimes an intruder, bolder than the others, would run only two or three yards and then suddenly turn and face the pursuer, sitting up on its hind feet like a little kangaroo. The pursuer at once assumed the same nearly upright position, with its fore feet close to its breast. Both would then begin to hop about watching for an opening. Suddenly one would leap at the other, striking with its hind feet, . . . [producing] a distinct little thump and the victim rolled over on the ground. After receiving two or three kicks the weaker of the combatants would run away. The thump made by the kick when they were fighting solved the mystery which had covered this sound heard repeatedly during my nights at this camp.

The brilliantly coated paper used throughout this book although hard on sensitive eyes, is necessary to the handling of the halftone illustrations. The printing of both the colored and uncolored pictures in all the copies we have seen has been done with pronounced success. The color drawings by Fuertes are admirable and we are astonished at the success with which this noted bird artist was able to turn to mammals, the drawings of which in this contribution mark as far as we know his first efforts in the new field.

A critical reviewer might succeed in finding a number of small points to elaborate upon and of which to complain. For instance: It is trite to say that an Alaska brown bear is no more an *animal* than is a house fly. Yet here we have the title, "Wild Animals of North America," though there is an evident effort made in the subtitle to remedy the matter by using the expression, "*mammal kingdom.*" But here a taxonomic blunder is tumbled into! We can hardly believe that Nelson himself had anything final to say with regard to the title page of this book, but that the editor of the *National Geographic Magazine* got in his work here in the belief so characteristic of editors of popular magazines that their public must be talked *down* to.

But to pin the attention of the reader of this review upon such really minute defects would do violence to the facts in the case, which are that, according to the convictions of the reviewer, Nelson's "Wild Animals of North America" is more uniformly accurate and at the same time replete with information along many lines than any preceding book on American mammals. And even more, it may be declared with confidence that this book is

by far the most important contribution of a non-systematic nature that has appeared in its field in America.

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SPECIAL ARTICLES

THE SUBSTITUTION OF SACCHARIN FOR SUGAR

IF saccharin can be substituted for sugar, it is evident that it must fulfill the functions of sugar and at the same time not produce harmful effects. As a sweetening agent, to be oxidized thereby furnishing energy and to increase oxidation in the body are three functions of sugar. It would seem that saccharin should fulfill admirably the function of sugar as a sweetening agent since it is about 500 times sweeter than sugar. There are some who think that the use of saccharin as a sweetening agent is harmful. The extensive investigations of Herter and Folin[1] for the referee board on the effect of saccharin on the nutrition and health of man show that the amount of saccharin that would ordinarily be used has no deleterious effect. Herter found, in fact, that such enormous doses as 4 grams of saccharin per kilogram of body weight could be given to rabbits without injury. It is recognized that saccharin can not fulfill the second function of sugar named, for it is not oxidized to give rise to energy, but passes through the body almost quantitatively unchanged. The object of the present investigation was to determine if it could fulfill the third function of sugar named, that is, does the ingestion of saccharin increase oxidation in the body. We[2] had already found that the ingestion of sugar, as well as the ingestion of the other food materials, produced an increase in catalase, an enzyme possessing the property of liberating oxygen from hydrogen peroxide, parallel with the increase produced in oxidation, by stimulating the digestive glands, particularly the liver to an increased output of this enzyme. Hence, the conclusion was drawn that the increase in oxidation following the ingestion of food was brought about by the increase in catalase. Our contention that catalase is the enzyme in the body principally responsible for oxidation is further supported by the fact, that by whatever means oxidation is increased in the body, there always results a corresponding increase in catalase, and by whatever means oxidation is decreased, there

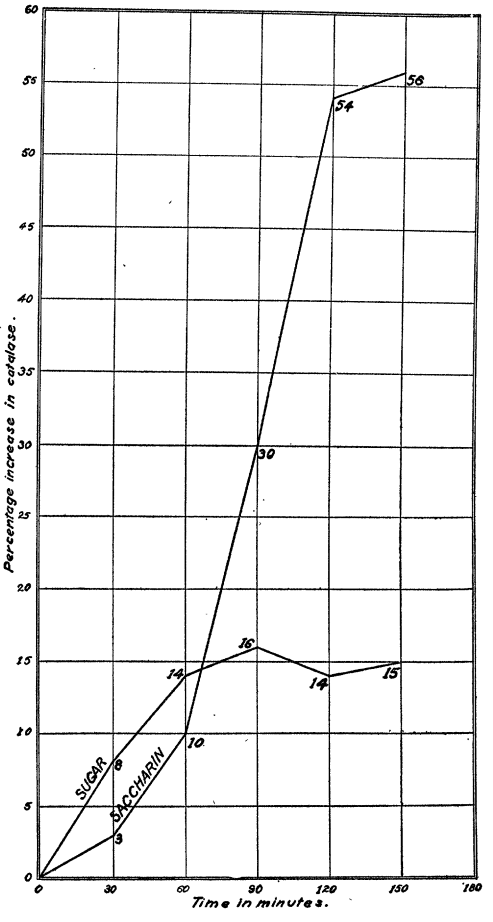

FIG. 1. Curves showing the increase produced in the catalase of the blood by the ingestion of saccharin and of sugar. The figures (0–180) along the abscissa indicate time in minutes; the figures (0–60) along the ordinate, percentage increase in catalase.

[1] Herter and Folin, United States Department of Agriculture, Report 94, 1911.

[2] Burge and Neill, *The American Journal of Physiology*, Vol. 47, No. 1.