the fish have been at liberty for 30 days or more. The longest period of liberty to date is 99 days. It is believed, then, that this mark should be permanent unless the carbon particles are later absorbed.

In two out of the twelve fish recovered bearing the body cavity tags the celluloid tag was noticed before the metal tag and in one case the celluloid tag was completely overlooked. The incision was completely healed in every case after the fish had been at liberty for 70 to 80 days. The longest period of time that any of these fish were out is 89 days.

It would be premature as yet to give a definite estimate of the value or the permanency of these marks or their superiority over the strap tag. If the tattoo marks do not fade over a greater period of time than is here recorded, this type of mark would be almost ideal for the halibut; and if it is used in addition to the regular strap tag, as was done in the present experiment, it should aid in the recognition of very nearly all the tagged fish that might be recovered. Furthermore, it would give a clue to whether and in what numbers strap tags have been overlooked or lost in past experiments. This the body cavity tag may also do, though a somewhat higher mortality from the effects of this mark is indicated.

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RUBBER CONTENT OF GOLDENROD LEAVES AFFECTED BY LIGHT

THE leaves of the many wild species of goldenrod (Solidago) contain rubber, frequently to the extent of 3 to 6 per cent.;[1] and as much as 13 per cent. has been obtained from cultivated plants in experiments initiated by the late Thomas A. Edison at Fort Myers, Florida. The rubber content increases with the maturity of the leaves, but as soon as the leaves die they lose most of their rubber, whether remaining on the plants or lying on the ground. With a view to learning whether light is a factor in the rapid decline of rubber in the dead leaves, samples were exposed to sunlight in Cellophane envelopes of different colors for various periods of time. The use of Cellophane was suggested by Flint's work on light-sensitive lettuce seed.[2]

Three species of Solidago were included in the test, *Solidago leavenworthii, S. altissima* and *S. fistulosa,* and the leaf samples were exposed in red, blue, green and clear envelopes. Check samples in black paper envelopes were exposed with the colored envelopes. The leaves exposed in the red, green and blue envelopes showed notable losses in rubber content, and those in the clear envelopes lost most of their rubber, while material from the black envelopes showed no loss, but often a gain. Samples of *Solidago leavenworthii,* which analyzed 4.39 per cent. of rubber at the beginning of the experiment, gave the following percentages after one week of exposure in the different envelopes: clear 3.38, red 3.63, green 3.75, blue 3.89 and black 4.72. The corresponding percentages after two weeks of exposure were 1.98, 2.69, 2.74, 3.28, 6.27; after four weeks 2.00, 2.69, 2.94, 3.28, 6.00, and after six weeks 1.81, 2.25, 1.97, 2.65, 5.98. Results with the other species were consistent, and the data leave no doubt that light is a factor in reducing the rubber content of goldenrod leaves after harvesting.

Analyses were made later of leaf material from the envelopes that had been exposed and then stored for several weeks in the laboratory, and it was found that the rubber content of the leaves in the black envelopes had not declined but had increased, while material from the colored bags showed a further decline in rubber content. Thus the black-envelope sample of *S. leavenworthii,* that analyzed 6.27 per cent. after two weeks' exposure in the field, contained 7.34 per cent. after six weeks in the laboratory, and likewise the samples exposed for four and six weeks increased after two weeks in the laboratory, from 6.00 to 7.12 and from 5.98 to 6.70, respectively. These data were obtained from samples grown at Glenn Dale, Maryland, and were confirmed by samples from Savannah, Georgia, and Fort Myers, Florida, that had received similar treatment.

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[1] Loren G. Polhamus, *Jour. of Agricultural Research,* Vol. 47, No. 3, Aug. 1, 1933, pp. 149–152.
[2] Lewis H. Flint, SCIENCE, Vol. 80, pp. 38–40, 1934.

THE YOUNGEST MEMBER ELECTED TO THE NATIONAL ACADEMY OF SCIENCES

IN the minute on Carl Barus (1856–1935) published in SCIENCE for November 22, 1935, pp. 481–483, Professor Lindsay and I wrote that at the age of 36 Dr. Barus was elected "a member of the National Academy of Sciences in 1892—the youngest man [that is, in 1892] who had ever been so honored." This unchecked statement was taken from an autobiographical sketch. A friend has drawn attention to one of my own articles on Simon Newcomb (1835–1909) published in SCIENCE for December 22, 1916, p. 872, where I noted that Newcomb became a member on September 1, 1869, when 34 years of age. Professor J. McKeen Cattell has informed me that at a later date, namely 1899, Theodore W. Richards was elected a member at the age of 31. Has any member been elected who was younger than 31?

While referring to the National Academy may I point out the great need for a volume containing a

complete list of those who have ever been members or foreign associates of the academy, together with exact dates of election. I have recently been astonished to find that it was necessary laboriously to delve into manuscript records before it could be learned that a certain distinguished scholar became a foreign associate in April, 1883. It is true that in the "Annual Report of the National Academy of Sciences" for 1930–31, one finds the following: (a) a complete list of living members, of members emeriti and of living foreign associates of the academy, with the *years* of election; (b) medallists of the academy, with the name of the medal and the year of the award; (c) a list of deceased members, with the year of election and the exact date of death; (d) a list of deceased foreign associates, without either the date of election or the date of death; (e) the exact dates of birth of living members of the academy. Now if all five of these lists were put in a single alphabet, with additional information, such as places and dates of birth, and of death if dead, *exact* dates of election and as full information regarding foreign associates as members, we should have a list which would be much more useful. Especially would this be true if it were kept up to date and published annually. For nearly twenty years the Academy of Sciences of the Institut de France has published such an *Annuaire,* the one for 1935 being a duodecimo volume of 407 pages covering the period 1795–1935. Another volume (281 pp.) covers the period 1666–1793. What better model could our National Academy follow in getting out its own volume for the period 1863–1936?

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SCIENTIFIC BOOKS

THE MORPHOLOGY OF ALGAE

The Structure and Reproduction of the Algae. By F. E. FRITSCH. Vol. 1, xvii + 791 pp. Cambridge University Press, England, and Macmillan Company, New York. 1935.

THE appearance of a major compendium in the morphology of one of the large plant groups is something of a scientific event; when well done, as in the present case, marked advances in knowledge of the group are sure to follow. But once has an adequate modern treatise on algal morphology been completed (F. Oltmanns's "Morphologie und Biologie der Algen," in two editions). The present work, in so far as the first volume of two projected is concerned, is more limited in scope in that ecological and physiological features receive no separate consideration, although a wealth of data on the environal requirements and food reserves of the various genera are included. With the benefits of the scientific advance of a very active decade and a much more detailed treatment, this work puts English-reading botanists at a great advantage. Should the work be completed in conformity it appears that the basis of reference for a generation will have been established. The title is really definitive, for with but a skeleton of classification the form and structure of these plants are discussed in detail. For the most part the approach is directed to the structures and organs characteristic of the family under consideration, their variation in the several genera and possible evolutionary trend. The information is so closely associated with the original sources by copious citation that a very detailed presentation results, since the author attempts to introduce all pertinent literature since 1890. This puts the text quite out of the introductory class, and invaluable as this work will be to the phycologist it will offer a rather complex picture to any one who approaches it without a little preliminary experience with algal literature. As a source book it will save much labor, but it is not designed to serve as a teaching text, even for advanced students.

The algal groups covered in the present volume include all except the Phaeophyceae and Rhodophyceae. The 75 pages of introductory discussion provides descriptions of these groups and tables contrasting various critical structures. However, the main introductory sections deal with the chief fundamental parts such as chromatophores, nuclei, the flagella and the wall, or more inclusive features as filamentous and tissue organization, growth and reproduction, epiphytism and parasitism in such fashion as to give a very good picture of the algae indeed. Especially timely in view of the numerous equivalent classes of algae is the emphasis on parallelisms in evolution among them. In the body of the book the treatment is much more thorough than that accorded by Oltmanns, particularly in the flagellate types. There is little to be said about the systematic frame adopted. It appears to be well and carefully adjusted to recent researches, and the eleven classes offered have wide acceptance. The author exempts Chloromonadineae and Euglenineae from the word-form standard for classes in the algae, but his reason (lack of members with complete "algal organization") seems hardly to offset the disadvantage of lack of uniformity, since he accepts Cryptophyceae and Dinophyceae, which are so largely flagellate in the vegetative state. Xanthophyceae is used to include the familiar Heterokontae, which brings that group into line; the charophytes are discussed as an order in the Chlorophyceae, which some will feel to be hardly adequate recognition of