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NOTE ON SACCORHIZA BULBOSA, J. G. AG., AND ALARIA ESCULENTA, GREV.—In his paper on the structure and development of the bulb in *Laminaria bulbosa*, Lam. in Vol. III of the Annals of Botany (pp. 41–64), Barber gives an interesting *résumé* of the literature dealing with this plant. From the references there given, it would not appear that the duration of the plant had, at that time, been satisfactorily settled. From observations made last year while collecting Algae on the coast of Anglesey, I have satisfied myself that the species is an annual, and in this respect contrasts sharply with the other British Laminariaceae.

During the spring tides of March, I had an opportunity of examining *Saccorhiza* growing, and at that time, I found it represented by specimens in two widely different conditions. First, there were large bulbs often more than a foot in diameter, from which the whole of the blade, and almost the whole of the stalk had disappeared through decay. The bulbs themselves were as yet sound, and required the exertion of considerable force to remove them. Among these blackish masses, bristling with 'hapteres,' were numerous young plants of a lighter colour, and exhibiting the various stages in the development of the bulb described by Barber; but in no case had the bulbous portion attained a diameter of more than four inches, or the whole plant a length of more than two feet. Upon visiting the same site during the spring tides of October, I could find no trace of exfoliated bulbs or of young imperfectly developed plants. All the specimens were now in the condition of the mature plant, with which we are made

familiar in Harvey's figure (*Phycologia Britannica*, pl. 241). It would thus seem that the young plants of March were the progeny of the plants of the previous autumn, maturing in the next autumn, to remain however, as exfoliated bulbs as late as March of this year. The plant is therefore an annual in the sense that the plants of one year produce the crop of the next; in the same sense, that is to say, as winter-sown wheat is an annual.

I have since ascertained that Setchell, in a paper on the Life-History of *Saccorhiza dermatodea* (De la Pyl.) J. G. Ag. in the Proceedings of the American Academy, Vol. VI, expresses himself as convinced of the annual character of that species, and states that De la Pylaie and Areschoug had come to the same conclusion. It would thus seem that two of the species removed from the genus *Laminaria* into De la Pylaie's genus *Saccorhiza* turn out to be annuals.

The absence in *Saccorhiza bulbosa* of the intercalary growth, which in British Laminarias forms a new lamina each year, the non-occurrence of a zone of secondary thickening in the stipes, as well as a softer consistency of the whole substance of the plant, are all to be correlated with the fact of its lasting for a single season. The persistence of the bulb for some time after the disappearance of the stalk and blade, adds a new interest to Gardiner's¹ discovery of sporanges upon the 'roots.'

In the same paper by Barber as is referred to above, when speaking of the annual shedding of the lamina in the Laminarias, he remarks that 'it is stated by Reinke to occur also in *Alaria esculenta*.' It may fairly be concluded, I think, from the bright olive colour and entire condition of the proximal portion of the blade, when contrasted with the darker colour and frayed condition of the distal portion, that an intercalary growth takes place in *Alaria* in the same region as in the Laminarias. This appearance however persists throughout the year, and I have not seen any evidence of a similar insertion of an entirely new lamina in the spring as occurs in *L. digitata* and *saccharina*. The intercalary growth in *Alaria* seems to be continuous; in *Laminaria*, periodic. It is interesting to notice that young specimens of *Alaria* not more than two or three inches long exhibit the same fresh appearance of the near end, and frayed appearance of the free end as occur in specimens several feet long.

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¹ Proc. Camb. Phil. Soc., V, 1885.

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