

sown on the injured place. It was found that the cells immediately surrounding the place of injury were rendered susceptible to the attacks of a 'biologic form' which is unable to attack uninjured leaves of the plant in question.

In the third part of the paper, dealing with general considerations, the following hypothesis is advanced as to the actual manner in which the injury to a leaf causes it to become susceptible to a 'biologic form' otherwise unable to infect it. It is supposed that the leaf-cells of each species of host-plant contain a substance or substances—possibly an enzyme—peculiar to each species which, when the leaf is uninjured and the cells are vigorous, are able to prevent the successful attack of any mildew except the *one* 'biologic form' which has become specialized to overcome the resistance. When the vitality of the leaf, however, becomes affected by injury, this substance is destroyed, or becomes weakened, in the leaf-cells in the neighbourhood of the injury, so that the conidia of *other* 'biologic forms' are now able to infect them.

The author suggests that injuries to leaves, caused in nature by hail, storms of wind, attacks of animals, &c., may produce the same effect as the artificial injuries described above in rendering the injured leaf susceptible to a Fungus otherwise unable to infect it. Conidia produced on these injured places would be able to infect uninjured leaves, and would spread indefinitely. Such may be the explanation of a common phenomenon—the sudden appearance of disease caused by parasitic Fungi on plants hitherto immune.

A case is described which, it is believed, gives evidence that the injuries produced by *Aphides* caused leaves previously 'immune' to become susceptible.

In the concluding remarks, reference is made to the antagonistic forces concerned in the evolution of a 'biologic form,' viz. 'specializing factors' and 'generalizing factors.'

Attention is also drawn to the close parallel between (1) the behaviour of the Fungus in the experiments in which the conidia were sown on the tissues of the leaf exposed by the cut; and (2) the biological facts obtaining in the class of parasitic Fungi known as 'wound parasites' (*Nectria*, *Peziza willkommii*, &c.), which are able to infect their hosts only through a wound.

ERNEST S. SALMON, Cambridge.

ON THE STRUCTURE OF THE PALAEOZOIC SEED LAGENOSTOMA LOMAXI, WITH A STATEMENT OF THE EVIDENCE UPON WHICH IT IS REFERRED TO LYGINODENDRON.—The present communication deals with the structure of *Lagenostoma Lomaxi*, a fossil seed from the lower coal-measures, and with the evidence upon which the authors refer it to the well-known carboniferous plant, *Lyginodendron*.

It is found that this species of *Lagenostoma*, especially in its young form, was enclosed in a husk or cupule, borne on a short pedicel.

The seed, which is of Cycadean character, is fully described, and its relation to other fossil and recent seeds discussed.

¹ Abstract, reprinted from the Proceedings of the Royal Society.

The cupule enclosing the seed was borne terminally on a pedicel ; it formed a continuous, ribbed cup below, and divided above into a number of lobes or segments. Externally, both pedicel and cupule were studded with numerous prominent multicellular glands of capitate form. The anatomy indicates that the whole organ was of a foliar nature.

A comparison with the vegetative organs of *Lyginodendron Oldhamium*, with which the seeds are intimately associated, demonstrates a complete agreement in the structure of the glands and in the anatomy of the vascular system. Where vegetative and reproductive organs, presenting identical structural features, not known to occur in other plants, are thus found in close and constant association, the inference that the one belonged to the other appears irresistible.

As regards the position of the seed on the plant, two possibilities are discussed ; the cupule, with its pedicel, may either represent an entire sporophyll, or a modified pinnule of a compound leaf. Either view is tenable, but various comparative considerations lend a somewhat greater probability to the second alternative.

In the concluding section of the paper, the systematic position of *Lyginodendron* is discussed. On the whole of the evidence, the position of the genus as a member of a group of plants transitional between Filicales and Gymnosperms appears to be definitely established. While many Filicinean characters are retained, the plant, in the organization of its seed, had fully attained the level of a Palaeozoic Gymnosperm. There are many indications that other genera, now grouped under Cycadofilices, had likewise become seed-bearing plants. It is proposed to found a distinct class, under the name *Pteridospermae*, to embrace those Palaeozoic plants with the habit and much of the internal organization of Ferns, which were reproduced by means of seeds. At present, the families *Lyginodendreae* and *Medulloseae* may be placed, with little risk of error, in the new class, *Pteridospermae*.

F. W. OLIVER and D. H. SCOTT.



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