

- II. "On the Structure and Life-History of *Entyloma Ranunculi* (Bonorden)." By H. MARSHALL WARD, M.A., F.L.S., Fellow of Christ's College, Cambridge, and Professor of Botany in the Forestry School, Royal Indian Engineering College, Cooper's Hill. Received October 12.

(Abstract.)

The author found plants of *Ranunculus Ficaria*, the leaves of which were all spotted with white patches; the white patches spread from leaf to leaf, and the disease assumed the nature of an epidemic. The rise, progress, and climax of the disease were observed both on isolated plants and in the open country, and the nature of the lesions in the leaves was made out. Evidence was found to support the view that some plants succumb more rapidly; this evidence was tested, and the circumstances to which the differences are due explained.

The white disease-spots contain the extremely delicate mycelium of *Entyloma Ranunculi*, and the resting-spores of this fungus (one of the Ustilaginæ) were observed on it. The mycelium is intercellular, and makes its way in the middle lamella between contiguous cells. The white powder on the outside of the disease-spot consisted of conidia, very like those of some Ascomycetes. The author examined the anatomical connexion between the conidia and the resting-spores, and showed that the conidia really belong to the same mycelium—in other words, the conidia are a second kind of spore of the *Entyloma*.

Even more important is the germination of the conidia. This has not been before observed in any *Entyloma*. The germination was traced step by step, not only on glass slips, but also on the living plant. These infections yielded the result that the germinal hyphæ entered the stomata, and produced a mycelium exactly like that in the disease-spots first investigated; not only so, but the *resting-spores of the Entyloma were produced on this mycelium*, thus placing beyond doubt the connexion of the two spores. It was observed that it required a certain time for the disease to spread: this interval of time is the same as that occupied in infecting plants with the conidia. Moreover, all the symptoms of the disease produced by infection with the conidia were as before.