fruited in it. In peptone the fungi grew rapidly and luxuriantly, proving it to be a favorable source of nitrogen.—MARY H. SMITH, *Botanical Department, Cornell University.*

NON-SEXUAL PROPAGATION IN OPUNTIA. II.

A VERY interesting Opuntia which has recently come to my notice in studying the various propagative methods of the Cactaceae is *O. arbuscula* Engelm., a small, more or less arborescent form, densely branched, and reaching a height of about 15^{dm}. This plant sets an abundance of fruit which appears to mature well, but which upon examination is found to contain very few good seeds. So laden is the plant with its fruit that its branches, as a rule, bend over so as almost, if not quite, to touch the ground. In this position there takes place a process analogous to "layering," new shoots of an apparently primitive character arising from the decumbent branches, which also give off roots into the soil. The same formation of primitive shoots occurs in joints detached from the parent plant. This is also true of fruits, from the sides of which both stems and roots may often be found forming, so often, in fact, that this must be regarded as the rule rather than the exception. We have here the case of a structure, modified primarily for sexual purposes, turned finally to use in a non-sexual way, to accomplish, broadly speaking, the same end.

Still another method of propagation, perhaps not very common, yet apparently not infrequent with this species, is by the formation of adventitious shoots on the roots. The roots are, in this form as in the majority of the Cactaceae, divided into two systems, as already described.[1] On the absorptive roots, which run just below the surface, there arise, at some distance from the main plant, adventitious shoots of a character far more primitive than those formed on fruits or fallen joints. The leaves of these shoots are in some cases over 10^{mm} long, green, and succulent. By the time these shoots reach the height of about 2^{dm}, the root connecting them with the parent plant dies, thus leaving them independent at an early stage.

The distribution of this species is very well defined. It occurs almost exclusively in those slight depressions in the plain, which in time of hard rains are washed by broad and shallow streams of surface

[1] BOT. GAZ. 30: 348 *seq.* 1900.

water. Here it grows in colonies, following the lines of the depressions. The soil in such places is much finer and less pebbly than that on the slight elevations near by, but experiments in transplanting have demonstrated that this distribution is not due to soil characters. It seems probable that the fruits and joints are washed down by the stream, and settle at various places along the course. From the single plants so started colonies soon are formed, through the agency in part, it may be supposed, of root propagation and "layering."—CARLETON E. PRESTON, *Harvard University*.