that there is something to keep the grasshoppers and other insects in check (pp. 101–2).

The statements in this paragraph seem eloquent of the spirit of the man. He found out many things that others did not know and strove after a genuine appreciation of the relations of things about him. He was one of the earliest to take the direct method of doing this in the field of American economic ornithology. That his work has remained unnoticed because of a name is a pity. His observations are not trite to-day, but, on the contrary, they possess freshness, almost novelty. That such is the case after a lapse of more than forty years is a significant tribute to an able and original man.

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GALL-INSECTS AND INSECT-GALLS.

In no phase of biological work are the results of the neglect of cooperation more apparent than in the study of 'insect-galls' and 'gall-insects.' In fact many of our best scientists fail to recognize the two closely related subjects as distinct and continue to use the terms synonymously, although the one is botanical while the other is entomological. The entomologists have given considerable attention to the study of gall-insects, but the study of insect-galls has been woefully neglected, while lack of cooperation has made much of our entomological knowledge of questionable value.

For some time the writer has been bringing together the literature upon these two subjects, and it may be of interest to the readers of Science to see a summarization of the work in hand at this time. The six orders of insects containing gall-makers, include 16 families, 77 genera and 583 species (not counting leaf curlers and those for which galls have not been described, but which we have every reason to suppose are true gall-makers). These galls arranged with reference to the host plants show the following: 26 orders, 51 families, 90 genera and 188 species affected. Of the 26 orders 12 show only one family in each to be affected; of 51 families 26 have only one genus affected; of the 90 genera 63 have only one species in each affected. The genus *Quercus* leads with 45 affected species and *Salix* is second with ten affected species.

These figures are absurd and every student of either entomology or botany believes that the list of host plants should be much longer.

Let us look for an explanation: (1) The botanist has given practically no attention to the subject, although every herbarium of importance contains more or less galls that have been incidentally collected. (2) The entomologists have studied the insects rather than the galls and too often their descriptions of the galls have been indefinite. Furthermore, the determinations of the host plants in many cases have been uncertain or entirely omitted. Papers have been published without giving the common names of the hosts, others with only the common names, others with only the generic names and others in which it is evident that the determinations are incorrect. A well-known botanist in examining my list recently remarked: 'Here you have a number of galls attributed to a single host plant, while I have seen galls on four different species of that genus.' Yet, I have reason to believe that I have examined practically all the North American literature on the group of gall-formers to which he referred. I have also received from well-known entomologists, galls of the same species bearing different names.

The study of the insect-galls and their makers, parasites and inquilines presents a very large number of interesting problems of which the following may be mentioned: (1) We know very little concerning the dimorphism of the American species. (2) We know nothing of the relation of the distribution of the insect, to the distribution of the host plant. (3) We have very little reliable data concerning the ability of any one species of insect to produce galls upon more than one species of host plants. (4) Very little has been done on the anatomy of the American galls. (5) Very little has been done on the physiology of the galls.

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