

knowledge of, the enterprise. This fund of information will give a basis for studying the social effects upon the farm population itself, and of estimating the special value of a policy of country planning in the development of country life in America.

The kinds of examples of country planning which the division of Farm Life Studies is particularly desirous of locating are as follows: Country parks (not State or Federal) for country people, outside villages and cities; public reserves in the country, that is, spots of natural beauty or of historic interest reserved for public use either through private benefaction or by local government; "gateways" to town or village from the farming country—that is, improved fringes of towns and villages, where highways lead from the farms planned and maintained through private or public means; colonization planning by land companies, which provides beforehand for better adjustments of rural community life; special outdoor art features, such as may be illustrated by certain farm athletic fields, farm roadside tree plantings, country bulletin boards, country cemeteries, community buildings, detachment of farm houses from farm work by screening effects.

The technical landscaping phases of country planning are promoted by the Bureau of Plant Industry, U. S. Department of Agriculture. The technical side of country planning, highly important indeed in its place, is not, however, a subject of inquiry in the present study. On the other hand, the human conditions and motives which lead to outdoor art improvements or which on the other hand, prevent or retard such improvements among American farm population groups, are the immediate aim of the study. There are presumably inducements to a country art movement not now generally recognized. There are possibly social values in country art which may become convincing to farmers when once analyzed. The result will doubtless increase the demand in farm communities for the outdoor art technician.

It will help to forward this work if any one conversant with the particulars of any out-

standing instance of the foregoing phases of outdoor country art, will send some account, and photograph or other pictorial representation of the same, to the undersigned.

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QUOTATIONS

CUSTOMS LEGISLATION IN ENGLAND

So far as makers of scientific apparatus are concerned, we believe they are not satisfied with import duties, and want prohibition of import for a time, with permits to import in special cases. Many consumers have stated their preference for a system of subsidies to enable prices to be low enough to compete with foreign goods. Such a scheme naturally offers difficulties, and there would need to be assurance that efforts at improvement are being made. There seems to be no reasonable objection to the price being made as nearly as possible equal to that of the foreign article, so that the competition should become one of quality. The bill, however, will probably be passed, although it may still be possible to insert provisions to enable free import to recognized scientific institutions. Such permits must be of a general character, not requiring renewal, and not demanding the intervention of the customs or other government department. No special licenses for individual cases would be satisfactory.

How obstructive to scientific progress the customs regulations may be is shown by letters that have appeared in these columns. The question of books is a very serious one. Incidentally, reference may be made to the increasing difficulty of publication of scientific papers, which seems to be greater in England than in other countries. But here again what is wanted is a general fall in prices, and this can be brought about only by a return to normal trade relations throughout the world.

Much stress was laid by certain speakers in the House of Commons on the necessity of our industries as a national insurance in case of future war. The only remark that need be made in this place is that the most important matter is to keep abreast of scientific work in other countries. Restriction of research is

likely to do more harm than the more or less ineffective artificial protection of a few industries would do good. It is to be hoped, therefore, that institutions in which such scientific research is carried on will be placed beyond the effect of the new restrictions on import.—*Nature*.

SPECIAL ARTICLES

THE PRACTICAL SIGNIFICANCE OF THE REVOLUTION OF THE EMBRYO IN APHID EGGS

IN 1916 W. F. Turner¹ and the writer published a paper on the green apple aphid, in which certain studies on the embryology of the species were reported. Studies on other species have since been completed and it seems now worth while to point out the important bearing that certain phases of the embryonic development have on the hatching of the egg under varying conditions. This seems especially urgent from the viewpoint of control in the egg stage.

As pointed out by Baker and Turner, the egg envelopes in the three common apple species, *pomi*, *malifoliae* and *prunifoliae* (*avenae* of American authors) are two in number, the chorion which is thick and glossy black in color and the vitelline membrane which is delicate and transparent. At the time of deposition the egg is embedded by the female in a viscid material which serves to hold it in place on the twigs. This soon hardens and firmly fastens the egg in its location. This material covers irregularly all eggs and serves not only to cement them to the twigs but also as a protection for the chorion during the winter. It no doubt corresponds, in the Aphidinae to the waxen coating with which the females of the Eriosomatinae cover their eggs. A somewhat comparable condition is met with in other insects in which a glutinous cap covers the micropyle-area and may extend as an envelope over the greater part or even the entire egg.

The eggs of all three species when laid are of a somewhat greenish color and this changes ultimately to the glossy black of the winter-

ing egg. This change in color coincides with preliminary embryonic development. This usually occupies about five day's time. Eggs which are infertile or in other ways abnormal do not change color in the usual way. In fact most infertile eggs are not of the normal green color when laid but have an orange or brownish tinge which may darken with age.

One of the most interesting phases in the development of these aphids is the resting stage of the embryo. All eggs, no matter whether laid early or late, reach this same stage for wintering. This is the normal dormant condition. The embryo lies in the center of the egg with its cephalic portion toward the posterior pole. The caudal half of the abdomen is reflexed dorsad in such a manner as to include the ovarian yolk. Segmentation is well marked and the formation of the appendages has begun. The stomatodeum and proctodeum are present while the formation of the mesenteron has begun. The genital rudiments are separated into two groups but the ovarian yolk is not yet divided and at the posterior pole lies the polar organ.

In this condition the embryo, especially of *pomi* and *malifoliae*, remains until early spring and it must remain in this condition throughout the winter until normal growth is resumed. Attempts to force the eggs to their spring development are without success.

In the early spring development is resumed. This takes place in the vicinity of Washington, about the middle of March with *pomi* and *malifoliae*. This development is accompanied by a movement of the embryo through the yolk toward the posterior pole until that portion of the amnion which lies above the head comes in contact with the serosa at its junction with the polar organ. The two envelopes then rupture here and the embryo revolves. This is a most important period in the development of the species and the time of this revolution is of great significance in understanding certain results which have been obtained by different workers.

It has been shown by Baker and Turner that an elevation of temperature before revolution is fatal to the embryo. It is also im-

¹ *Journal of Agricultural Research*, Vol. V, No. 21.