Without wishing to detract from the merits of science-teaching, which is generally excellent, we wish to suggest that more quantitative work of an elementary nature might with advantage be added to the programme of individual practical work, and, as is done in a few schools, special prizes might be given to encourage minor research work, which could be carried out by enthusiastic pupils after school-hours.

AGRICULTURE.

The most interesting recent developments in science have been in connection with the teaching of agriculture and home science. For some years it has been contended that the former should be more generally studied in New Zealand, in order that pupils may be put in closer touch with their environment; and it seems a rational contention that a science which has reference to a pupil's surroundings is likely to be more educative than one which is bounded by the laboratory-walls.

The study of agriculture commends itself to many also as a direct assistance in gaining a livelihood, a view with which we do not care to deal except to say that, *ceteris paribus*, we see no objection to the study of agriculture because it may be, in the case of many pupils, a "bread-and-butter" subject.

Again, it is urged that agriculture is not a pure science, but merely an application of the laws of chemistry, botany, physics, &c., to extra-laboratory conditions. True, much of what is known as "agriculture" is based upon the laws of the "pure" sciences, and an acquaintance with some of these laws is an absolute prerequisite to the study of agriculture. Yet, while many of the problems of "agricultural science" can be solved by reference to the "pure" sciences, there are many other problems outside the range of these sciences—*e.g.*, the interaction of soils, manures, plant-life, and bacteria in any plot of ground gives results not fully explainable by either chemistry or botany. In its dependence on the more formal sciences, and in the fact that it is a complex subject, agriculture resembles economics and meteorology.

Does agriculture suffer, then, as a school study on account of its imperfectly defined position among the sciences? The "pure" sciences have been systematized, the prescribed experiments come out with regularity and precision, the materials and apparatus generally permit of complete control of any action that takes place. This is all very pleasing and satisfactory, especially from the teacher's standpoint, and perhaps essential for a simple and coherent understanding of fundamental scientific principles. "Complications" may sometimes be as disturbing to a teacher as they always are to a doctor. But the very mechanical exactness of a science may rob it of that stimulating element of surprise which irregularity naturally promotes. No young student of a "pure" and "exact" science can hope for a pleasurable thrill comparable to that of "some watcher of the skies when a new planet swims into his ken." The happening of the unexpected and the consequent stimulus to inquiry seem, indeed, to be very valuable factors in education, and agriculture may, in fact, be a valuable study in spite of and even by virtue of its unscientific inexactitude.

Again, the fact that agriculture is based upon several sciences inevitably causes the interrelation of these latter to be emphasized. The result is that the student of agriculture really gets a wider scientific training than is given by the intensive study of one science, and specialization in any one science is perhaps best postponed till after the secondary course is finished. While at a secondary school, the pupil should learn that correlations between the sciences are commonly met with in nature, and that one science is not divorced from another. Agriculture early lays this broad basis for general science-training. Apart altogether from its potential economic value, there seems to be a strong *ex parte* argument for the adoption of agriculture as one of the main sciences in boys' schools.

Unfortunately, agriculture as a secondary-school subject either inclines unduly towards vocational training or else is made subservient to botany and chemistry through being limited to laboratory practice and study of text-books. In the one case no sound scientific basis is given to the work; in the other case the instruction tends to be purely theoretical. If agriculture is to become a useful school subject teachers must learn to steer a safe middle course. Their aim must be to turn out neither skilled farmers in the ordinary sense of the term nor pure theorists, but rather to encourage young men to cultivate a scientific outlook upon and an intelligent interest in their environment.

The following brief suggestions are given for the benefit of teachers of the subject:—

(1.) The teaching-periods should be about equally divided among laboratory practice, theoretical instruction, and field-work.

(2.) The laboratory course, for the first two years at least, should be mainly along general lines—properties of air and water, relative density, acids, alkalis, bases, &c., being studied.

(3.) The experimental area should not be too large. Pupils' time should not be taken up in the routine operations of digging, weeding, hoeing, &c., except so far as is necessary for instructional purposes. If desired, boys may work in pairs, but usually each boy should have a separate plot, which should be quite small—say, 25 ft. by 12 ft.—and which he should be required to cultivate, explaining each operation on scientific principles and observing the habit and growth of each plant. Groups of six or more may conduct co-operative experiments on depth of planting, effect of transplantation, intercultivation, &c., and there should be some continuous experiments conducted by the teacher and running over a series of years—top-dressing of permanent pasture, lucerne tests, seed-selection, &c. Variety tests—so dear to the heart of the average farmer—should generally be avoided as having little educational value and occupying much space.

In some schools there is a tendency to go in for a large experimental area (chiefly for spectacular purposes). If the pupils are not asked to spend an abnormal time in routine field operations, well and good; but it should be remembered that all the essential experimental work can be carried out on quite a small plot of not more than half an acre.