

## SCIENCE AND AGRICULTURE.

IN the course of his presidential address at the opening of the recent Science Congress at Christchurch Dr. L. Cockayne, F.R.S., made the following cogent and interesting remarks on science in relation to agriculture, with special references to New Zealand conditions:—

“New Zealand is above all else a farming community. Many of Nature’s secrets of one hundred years ago are now the priceless possession of man. These, when more generally applied than at present, will make our fields yield a much greater return. This would be a great advance, but without the discovery of further fundamental principles, now unknown, agriculture can only reach a stage far from perfection. Our scientific duty as a nation is not only to apply to the best of our ability our present knowledge, but by means of purely academic investigations to discover further fundamental principles on which the greatly improved farming of the future will depend. Suppose, for example, such characters as we wished could be bestowed at will upon certain fodder plants—*i.e.*, that the plant-breeder could by methods now unknown create exactly the plant suitable for a special environment, just as one can forge a special tool. Experiments of seemingly the most worthless kinds in genetics might lay the foundation for such knowledge. Even open-air studies of the plants of bog, or lake, or forest, or mountain-top might lend valuable assistance. . . .

“In this farming community nothing more demands years of close study than the soil itself. The world over, soil-science, notwithstanding many books on the subject, is in its infancy. Chemical analysis of a soil, even were the methods of so doing far more satisfactory than at present, is only one portion of the question. The extremely difficult matter of soil-physics at once confronts the investigator. Then there is the rich soil-flora and the rich soil-fauna. When more is known as to the relation of soil-physics, soil-chemistry, and soil-biology to one another, then undoubtedly new methods of soil-utilization will be in sight. . . .

“Our cultivated plants of all kinds are subject to attacks of parasitic fungi, the majority of which are considered identical with those affecting similar plants in other countries. For the suppression of such fungi many fungicides have been devised, especially in France and America. Now, these methods having been successful on trees in the country of their origin does not say that similar methods will serve equally well here. A certain apple-tree growing in California will probably differ greatly from the same variety grown on the clay soil of Nelson. The effect of the fungus on such a New Zealand tree, and the life-history of that fungus, must be studied in New Zealand; so, too, must be investigated the use of the fungicide. This method of attacking the pests of fruit-trees by means of fungicides and insecticides costs the State of California alone about £400,000 per annum. At best it is a rather clumsy way of dealing with the pests. It is exactly a case in