

CONDITIONS OF PLANT LIFE

Indian corn. We know, of course, that all wind-fertilized plants are very prolific in pollen, and that this condition is necessitated by the great waste involved in the process of wind-fertilization. But it has recently been shown to be probable that in the case of corn grown as we grow it, with plants in regular order in large masses, the amount of pollen produced is at least twice as much as is necessary for full fertilization. Now, the production of pollen is an exceedingly exhaustive process, and it would seem reasonable to suppose that the crop of grain might be increased if this waste of plant resource could be stopped. This has actually been shown to be true in some cases at least. In a series of experiments carried on at Cornell University during the past four years, the tassels or staminate flower clusters were removed from every alternate row at the earliest stage possible, with the remarkable result that there was an increase in the total crop on an average of the four years of over twenty per cent. The increased yield of the whole crop was entirely due to the increase on the detasselled rows, and this is readily explained by the fact that the plants here being relieved from pollen producing, all their energy was applied in the direction of seed-development.

Darwin discovered long ago that atrophy of seeds was frequently accompanied by a gain in size and quality of fruit. It is now an object of ambition among scientific fruit-growers to obtain by selection and cultivation varieties with small seeds or none. Recent triumphs in this direction are the California Navel Seedless orange, and the Lincoln Coreless pear. Great efforts are being made to reduce the size of the seeds in raspberries. In tomatoes the pulpy placenta and out-

side walls have been developed and the seeding quality discouraged until now two varieties have been produced, the Ponderosa and the Crimson Cushion, in which the quantity of seed is said to be less than one-third of that produced by the varieties in cultivation but a few years ago. We have long had in the market the seedless fruits of the Grecian grape currant and the Sultana raisin, and we know that as the result of being continually reproduced from cuttings alone the banana has lost the power of producing seeds. But our chief hope of improvement in this as in other directions is from natural variations shown either in seedlings or branches. Florists are always on the lookout for "sport" branches on their old standard sorts of roses for instance, and as a result we find distinct varieties being introduced nearly every year. Our young botanists ought to be instructed in such a way on these points that they could be on the lookout for useful variations and know them when they see them. Much good would result in the future if all young people could be so educated, and much good has been missed in the past because we and our fathers were not so educated. As a simple instance I may refer to the story of a neighbor of mine who says that when he was a boy, forty years ago, there grew on his father's farm a seedling apple of good quality that was almost coreless. Like the great majority of people he did not know the value of such a variation, but if he had that tree now it might be worth a good sum to him.

By continuous selection of favorable variations, by propagation from these, followed again and again and again by selection and propagation under favorable conditions of culture, mankind has