

SCIENTIFIC SECTION

SCIENTIFIC DRUG FARMING.*

BY H. C. FULLER.

I want to precede this reel¹ that I have brought, with just a few observations on the general subject of drug propagation. There has been some misapprehension in the minds of the great majority of the people regarding the question of drug supply, and especially drug growing. Most of us here are familiar with the literature that has been going the rounds of the scientific and especially the daily press on this matter, and with the alluring stories and propositions that have been placed before the general public relative to indiscriminate growing of drugs.

As I have sized up the situation after a good many years of study, there is a demand for the drug growing industry in this country. I believe, however, that the only important factors are those manufacturers who grow drugs for their own consumption, and enterprises for growing drugs whose sole object is the propagation, curing and marketing of these products. I do not think it will ever be possible, and I do not think it should be advocated to have the small grower, the small farmer with two or three acres, undertake the general propagation of drugs. It might possibly be profitable for a man of ability and with considerable land to grow certain drugs for some proprietary manufacturer or firm that would make a contract for his whole output.

In the first place the market conditions with reference to drugs are entirely different from those relating to other crops. The units consuming drugs are limited in number. They are practically confined to the manufacturing pharmacist, the manufacturing chemist and the crude drug dealer. The retail druggist does not require large amounts of crude drugs, and those he buys he can purchase to better advantage from the wholesaler, who in turn, of course, obtains them from the crude drug dealer. The question of sales is important. In fact, that is one of the most important points of this industry, and the novice can not cope with the skill and keenness of the drug buyer and drug broker.

The question of getting proper seed to start a crop is almost hopeless until the grower has studied the situation and developed his own stock. Then there is the question of proper soil and cultivation. Each drug requires different conditions and the grower should be a botanist; and he must know something about drugs and how the plants grow on their native heath before he can attempt to grow them commercially with any degree of success.

There is the question of plant diseases. Anyone who has ever tried to grow drugs has learned this lesson and also of the different insect pests that are likely to make luscious meals of drug crops. The growing of plant drugs requires the cooperation of a plant pathologist and a good entomologist.

Many of the most important, or staple, drugs that can be grown in the United States have to be started in greenhouses. This in itself requires quite

* Scientific Section, A. Ph. A., Indianapolis meeting, 1917.

¹ Motion pictures of the drug growing industry were shown.

an outlay of capital. Then, in order to produce enough material to make it worth while, special machinery is necessary both for planting and harvesting. And as drugs are not marketable unless they are of the proper appearance, and of the proper potency, the question of curing is extremely important, and that can only be done successfully in drying houses of proper construction, with proper regulation of heat, and other constant, careful attention until the crop is thoroughly cured.

Then, finally, and one of the most important features of the whole situation, is the control laboratory, because it would be ill-advised from every standpoint to go on the market with a batch of drugs of unknown potency.

There has been much progress made during the last few years in this work. Large pharmaceutical houses in the country have established their own drug growing farms, and they have been successful. The Department of Agriculture established the camphor industry in the south, and it has become an important industry. Hydrastis, which is important in our own materia medica, has been cultivated for a great many years by growers, operating small acreages in parts of the west and northwest. In Washington they have been doing something along that line, and the films which I have brought with me illustrate some of the points that I have tried to bring out in these prefatory remarks. The pictures will take you from the spring when we begin until the present time in our operations; in fact the last picture was taken only a few weeks ago when the thermometer was 124° F. in the sun.

(A series of pictures of the drug growing industry were here shown.)

DRUG PLANT CULTIVATION—DRUG PLANT BREEDING.*

BY F. A. MILLER.¹

I will omit introductory remarks and begin immediately with the slides,² attempting only a brief explanation of the work that we have been doing.

That which we have attempted to do in Drug Plant Cultivation and Drug Plant Breeding has been along the lines of improvement and economic production. I mean by economic production, an attempt to determine the possibilities of growing the more essential medicinal plants upon a basis, that would enable us to grow them as we grow other economic plants. If we set out to grow medicinal plants, regardless of the cost of production, we can probably grow almost any of them, but if we limit ourselves to those which can be produced economically, there are limitations.

(A plot of digitalis in its first year's growth was shown, followed by others of the series.)

During the year that we were working on digitalis, we grew and tested a large number of varieties, in fact all the varieties which could be obtained from this country, England, Germany and Japan, making a special effort to obtain seed of all named varieties and species. *Digitalis purpurea*, being a domesticated form,

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¹ Biological Department Eli Lilly & Co., Indianapolis.

² As indicated, Mr. Miller spoke while the pictures were being shown on the screen; the subjects related to breeding and cultivation of drug plants.