Seedlings of Sugar Cane at Barbados. (*Saccharum officinarum*, L.)

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mother-liquor should not be thrown away, but should be continually worked up with fresh juice.

The method recently given by Mr. Alvan Millson for the recovery of caoutchouc from the "Abba" tree, is admirably adapted for the treatment of the juice of the *Forsteronia floribunda*.

The rubber from this plant is so remarkably good that no time should be lost in submitting samples prepared on the spot. The rubber cannot be seriously deteriorated by any process likely to be used in its recovery.

There is no doubt but that the examination of the natural juice of a plant will, in most cases, enable one to point out what precautions should be taken to ensure the best result; still the fact must not be lost sight of that such an examination might lead one to suggest methods difficult of being carried out under surrounding circumstances.

The juice of the *Forsteronia floribunda* yields roundly one pound of dry and washed caoutchouc, or about 22 ounces of ordinary crude caoutchouc as generally met with, per quart.

A. About $2\frac{1}{2}$ ounces of this product was recovered, the weight being that of the washed and dried article. In colour and strength it approaches more nearly to the better descriptions of Para rubber. Mixed with sulphur and treated it vulcanized perfectly, in being solid, firm, and strong. It is a light colour when vulcanized.

B. About $1\frac{1}{2}$ ounce of this product was recovered when washed and dried. It was much darker in colour than sample marked A. This remark applies also to the washed product, but it is not nearly so tough as A.

LXXIV.—SEEDLINGS OF SUGAR CANE AT BARBADOS.

(*Saccharum officinarum*, L.)

The sugar cane is one of the most valuable economic plants we possess. It has been cultivated for so long a period that the primitive habitat of the species according to De Candolle, is unknown.* Bentham in *Flora of Hong Kong*, p. 420, states that "We have no authentic record of any really wild station of the common sugar cane." Further than this, in common with many plants that have been for a long time under cultivation and reproduced solely by means of buds and suckers, the sugar cane so rarely produces mature fruits that no one, as far as we are aware, has ever seen them. Certainly in the rich Herbarium at Kew there are no seed-bearing specimens. In botanical works the subject is often referred to, but apparently only to restate the fact that botanists like McFadyen in the West Indies and Roxburgh in India "have never seen the seeds of the sugar cane."†

Schacht is one of the few persons who has given a good analysis of the flower of the sugar cane including the pistil; he also had not seen the ripe seed.

In discussing the problem how far the saccharine qualities of the sugar cane could be improved on the same lines as those so successfully adopted with regard to the beet it was lately pointed out in a letter addressed to the Colonial Office that, owing to the power of

* *Origin of Cultivated Plants* (1884), p. 755.

† *Hooker's Botanical Miscellany* (1830), Vol. I. p. 95, tab. 26.

producing fertile seeds having apparently been lost by the sugar cane, it was impracticable to deal with it by means of cross fertilization or by the ordinary course of seminal selection. It was further pointed out that new and improved varieties amongst sugar canes were to be looked for amongst bud variations, and planters were advised to mark any canes that showed a departure from the type and cultivate them separately for experimental purposes, with a view to test their yield in sugar. Attention having thus been directed to the subject by official notices published in sugar-producing colonies, several communications have been received at Kew from persons who believed that they were able to afford some information on the point whether the sugar cane produces seed or not.

First, as regards the actual seeds of the sugar cane. A correspondent at Fiji, in forwarding a small packet to Kew in April last, stated "Some time ago there was published in the Government Gazette of this colony an extract from a letter from you in reference to sugar-cane seed. I have been 18 years in sugar-producing countries, and have never observed sugar-cane seed until within the last month, when one of my sons brought me a head fully ripened from a garden in my neighbourhood. Some time afterwards I went to see the sort of cane from which the seed had been gathered, but the plant was dug up and I could only learn that it was a purplish cane." The seed sent by this correspondent proved not to be the seed of a *Saccharum* at all; it was the seed of a *Sorghum*, and probably of *S. vulgare*, the common millet or Guinea corn.

Recently, however, a statement has reached Kew, from a trustworthy source, that seedling sugar canes had been found at Barbados, and that plants were in course of being raised at the Botanical Station in that island, under the care of Professor Harrison and Mr. Bovell.

Mr. J. B. Harrison is Island professor of chemistry and agricultural science at Barbados, and in conjunction with Mr. T. R. Bovell, who is superintendent of Dodd's Reformatory, he has been engaged for the last three years in cultural and chemical experiments with various kinds of sugar canes. The results of these experiments have been published officially by the Government of Barbados, and afford data of a valuable character as regards the effects of various manurial constituents applied to sugar canes, as also the relative merits of new and old varieties of canes now under cultivation in the West Indies.

The statement sent by Professor Harrison appears to prove, in a perfectly natural and circumstantial manner, that a few mature seeds may occasionally be produced by the sugar cane under certain circumstances. It is stated by Rumphius that the sugar cane "never produces flowers or fruit unless it has remained several years in a stony place." He does not, however, say whether he ever saw the fruit, nor does he cite any proof of the fact in the shape of seedlings, self-sown or otherwise. The canes that would be likely to produce fruit would be those varieties nearest to the original wild cane, and probably on that account they would be less rich in sugar than the canes improved by a long course of cultivation.

Without expressing a decided opinion on the subject, and in the absence of the specimens themselves, the information supplied by Professor Harrison is, so far, the most tangible of any yet received to show that the cultivated sugar cane may occasionally produce mature fruits.

Government Laboratory, Barbados, 17th September, 1888.

On certain of the higher districts of the island from time to time growths of sugar cane resembling fine grass have been noticed, but in most cases no attempts have been made to cultivate them. Mr. Parris some years ago succeeded in raising a few canes from the cane arrow or flowering shoot. Mr. Clarke did the same with the arrow of the purple transparent cane, but did not succeed in getting the seedlings to flourish, and my wife's father many years ago succeeded in getting the arrows to produce young canes, but not in cultivating them. Knowing these cases, Mr. Bovell and myself considered that a favourable opportunity of examining into this question offered itself during the cultivation of the varieties of canes which we have here. These canes were planted in rows of four broad by 25 feet deep, and so as to have two sets of each kind, in all 36 plots of 18 varieties, planted side by side. The plots were noticeable this year for the number of arrows sent up by some of the varieties. We gave strict orders to the labourers employed in weeding and watching the adjacent land to report to us any grasses springing up upon them in any way differing from the usual weeds. Towards the end of January they reported to us that a few tufts of grass different to the usual kinds were making their appearance. We found these to be growing in a rather narrow belt of the field on one side of the plots and in a little below it, following the direction of the prevailing wind. They were found not only on the surface of the field, but also on the bottom of a drain which had been dug in the field to a depth of 18 inches. Some 80 or 90 plants sprang up at intervals afterwards. We found a good deal of difficulty in keeping them alive, as the sun quickly shrivelled them up; it was necessary to protect them in many cases from the direct rays of the sun and to keep them constantly watered. In this way we succeeded in saving some 64 or 65 plants. Of these we carefully examined three or four so as to ascertain as far we could the absence of any particles of old cane in them. Their mode of growth was quite different to that of canes growing from the eyes of canes. Sixty plants were successfully transplanted, and are being cultivated. At present they are not far enough advanced in their growth to speak with certainty, but there appears to be amongst them several different kinds, probably five or six at the least. If you think it worth while, Mr. Bovell and myself will send you a specimen cane of each sort in January or February next, when they will be sufficiently far advanced to show their characteristics. The way in which they first grow is quite sufficient to account for them not being often noticed upon the fields. The weather here during January last was particularly favourable for their growth, and the fact of different varieties being grown side by side is, of course, much more favourable for the production of seed than the growth of one variety only. I have never heard of the Bourbon cane producing here fertile arrows, in all the alleged cases of fertility the arrows were either those of the purple or white-transparent varieties which, as you are aware, are prone to variation. We shall again attempt this year to obtain the same results. I am anxious to have the benefit of your opinion upon this year's results, as of course, if we can establish the fact of the cane occasionally, and, under certain favourable conditions, producing fertile seed, it will open an important field of investigation.

J. B. HARRISON.