

SCIENCE:

PUBLISHED BY N. D. C. HODGES, 874 BROADWAY, NEW YORK.

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CORN CANE.*

BY F. L. STEWART, MURRYSVILLE, PA.

It is the object of this paper to show from facts recently established that about one-half of the available food products of Indian corn are now wholly lost to us,—lost because unused and hitherto unknown to exist.

If it can be proved that what is thus lost can now be readily recovered, and not only so, but that it is recoverable as a new product from this plant, giving it an entirely new value, such attainable results will clearly be seen to be of great economic importance.

This consideration is entirely aside from the fact that much waste, which might be avoided, is often incurred in the production of our ordinary corn crop. Although great strides have been made within the past twenty-five years toward better farming in this country, by the adoption of improved implements and more systematic methods, it cannot be disguised that our treatment of maize, as an agricultural plant, is yet very defective, chiefly, as it seems, because its true nature and requirements are but imperfectly understood.

The tropical luxuriance of an American corn field, in the full tide of its summer growth, is something to awaken admiration; but the indulgence of such sentiment is commonly left to the artists and poets and the few students of vegetable physiology among us who have noted carefully the marvellous mechanical structure of the plant, its wonderful vigor and the perfect symmetry of its growth.

But all this goes for nothing at the harvest, when, in point of value, the dry, skeleton stalks are brought in contrast with the rich golden corn; and therefore the steady aim in cultivation has been to repress stem growth and increase the yield of grain.

No good reason is perceived why nature should so stubbornly persist in mounting the magnificent ears, which alone we set store by, upon solid culms twelve and fourteen feet high. And so, we have come to regard the huge stalks as the embodiment of much valuable constructive energy which might otherwise have been more profitably employed. True, this theory does not pass without protest; but it is satisfactory as shifting upon nature the responsibility for a condition of things which justifies the recent criticism of a surprised visitor out west, and complacently accepts it as true, that "Indian

corn growing is the only business in which a man can waste forty-five per cent of his capital and yet make a living."

Certainly our appreciation of this plant and our treatment of it would be different if we knew it better. Our acquaintance with it is not yet of that intimate kind that we have with the cereals and forage plants that migrated with man from the cradle of the human race. It is true that maize has been known to civilized man, more or less, for about 400 years. Its grain is by far our most important food staple. Its production now equals about 2,000 millions of bushels annually in this country alone, in value, about 700 millions of dollars. Our agricultural system is, in a measure, shaped by the requirements of the successful growth of this crop, and we are credited abroad with knowing all that is worth knowing about it.

It has been introduced, also, into all regions of the earth where it can profitably be grown. In its already recognized relations to the welfare of man, no acquisition from the vegetable kingdom has ever been found to equal it in value. Yet the obligation thereby implied to investigate thoroughly its nature and properties has most unreasonably been avoided by those competent to do it.

It has been taken for granted, apparently, that this plant has no uses beyond those already known. In this country, at least, its established rank among the cereals is so unique and unrivalled, and its capacity to supply all reasonable wants within what we have come to regard as its proper sphere, have seemed so complete as to awaken no desire for further investigation looking toward the discovery of any possible new uses of the plant or its growth and development under any other than the usual conditions.

Some ten years ago the writer of this shared with some others in the belief that both maize and the then newly introduced sugar millets or sorghums were entitled to a prominent place among sugar-producing plants for those regions of the temperate zones which are characterized by a sub-tropical summer climate. The experiments which seemed to justify such an opinion, however, were necessarily very incomplete, and covered a period of only about two years.

In the popular estimate of the comparative value of these plants the Cape millets or African varieties of sorghum were given the preference. This was also the view taken at the Department of Agriculture at Washington, to which, by special invitation of the Commissioner, the methods and results of some preliminary tests of mine were submitted for examination and report. It is outside of my present purpose to refer to those first experiments further than to say that they were repeated very successfully at the department by the chemist in charge and by others competent to do the work elsewhere, and the reports show that the conclusions first reached were abundantly confirmed.

In the years following experiments in sugar manufacture from sorghum began to be prosecuted under the patronage of the general government,—and of some of the State governments likewise,—and they have been continued with very variable results in different localities, but with the promise of permanent success, chiefly under the favorable climatic conditions prevailing in our southwestern States, especially Kansas and the Indian Territory.

The experiments being thus limited to sorghum alone, the value of maize in this connection was left entirely an open question. Practically, its claims were completely ignored.

What follows is simply a brief narration of work performed and of results reached in the course of an investigation begun and conducted throughout by myself in a private way to determine this question. It covers a

*An account of the results of an investigation concerning the value of Indian corn as a sugar-producing plant under new conditions of growth and development.