

phasizing his best efforts in the direction of the parallel cardinal virtues—faith, hope and charity—the last the greatest for the expectant reader.

SISAL HEMP CULTURE IN YUCATAN.

By CHARLES RICHARDS DODGE.

AMONG the hard fibers, so called, the henequen or Sisal hemp of Yucatan must take first place as a fiber product of the American continent, standing only second, in my estimation, to the Manila hemp of commerce, produced in the Philippine Islands. During a

carrying the cleaned fiber to other attendants—usually boys—who secure it and lay it evenly in piles. A dump car under the machine platform catches all the waste, and as these cars are filled they are run out over the same railroad to the dump pile. The wet fiber then goes to the yard to be dried in the sun, spread over low frames upon which galvanized iron wires have been stretched. When thoroughly dry the fiber has only to be sorted and baled and it is ready for market. The seat of the industry is Merida, Progreso being the shipping port, whence the fiber goes to many portions of the world.

A glance at Fig. 1 shows the Sisal hemp plant as

therefore are not transplanted). The flowering of the plant, as I have stated, ends its life.

In the question of the longevity of the plant is involved a dollars' and cents' proposition. If the leaves of a plant, as they develop, can be annually cut until it reaches an age of twenty years in cultivation before blossoming, as in Yucatan, it means that an annual crop of leaves may be taken for fiber during a period of fifteen years. Look again at Fig. 3, a fifteen-year-old plant in Yucatan. Unlike Fig. 1, it has not only developed a definite "trunk," but successive annual cuttings of leaves has added to the length of the trunk, so that the leaves, instead of spreading out near the surface of the ground, are produced at the height of a man's head. Nowhere out of Yucatan has the writer seen a Sisal hemp plant with a trunk like Fig. 3, nor a photograph of such a plant, with one exception—the exception proving the rule. A photograph of two lone plants in eastern Mexico has been shown me, where there was something of a trunk, doubtless the result of some peculiar local conditions. Many mature plants were examined by the writer in Mexico proper, growing in mere experimental plots in good soil. Where the plants were observed to be blossoming freely, and the matter was looked into, it was learned that they had not been set out longer than seven or eight years. And many in these plots had already blossomed and were dead.

Recent photographs of the Sisal fields of the Bahamas tell the same story, and it is scarcely ten years since the industry was started in those islands as a commercial venture. Fig. 4 is a group of Bahamian Sisal plants, already blossoming, from a recent negative by Mr. L. H. Dewey, of the Department of Agriculture.

If the peculiar conditions which prevail in Yucatan produce plants that will survive twenty and twenty-five years, while in other countries they will blossom and die under the age of ten years, it is obvious that the Yucatecans have a decided advantage in the matter of extended usefulness of the plantations after they have reached maturity.

Regarding the influences which retard the blossoming in Yucatan, there should be an investigation before conclusive statements are made. The farm owners in Yucatan tell me that cutting the leaves for fiber retards blossoming, say, for three or four years. My own idea, based upon observation during a limited visit, is that the soil around Merida, being largely no soil at all, but honeycombed ledges of coral rock—in the crevices of which the plants are often propped in place by small stones until they root—the plants mature so slowly that there is no excess of strength or vitality to be employed in building up a fleshy leaf, or rank growth of pulp cells, at the expense of fiber, for it has been shown again and again that a thick succulent leaf yields but little more fiber than a thin hard leaf produced under more arid conditions. Nearness to sea level, with high temperature, if not the influence of the sea air itself, has much to do with the favorable conditions of growth which prevail in Yucatan. It is agreed by the owners that too much water is infinitely worse than too little water. In point of fact, the Yucatan plants get no water out of the rainy season, and yet everywhere that the writer went, almost at the end of the dry season, the plants were found in apparently superb condition. The fields were so dry in places that smoking in them was not tolerated for fear of destruction by fire.

Transplanted into good soil rather than setting out in coral rock, the plants are able to utilize the water in the soil for a long time after the rainy season is over, the leaves becoming larger and more succulent and tender and maturing earlier. A leaf from an experimental plot in eastern Mexico, weighing thirty-four ounces, and grown in good soil, yielded 41.02 grammes of fiber, or about 1.25 ounces, while a 25-ounce leaf from Yucatan, of about the same age, yielded 41.65 grammes. Another Yucatan leaf grown in a very stony field and weighing only 14 ounces produced 31.47 grammes of fiber.

The facts are interesting, and those who may be contemplating the culture of Sisal hemp in other lands can well afford to investigate the subject from the

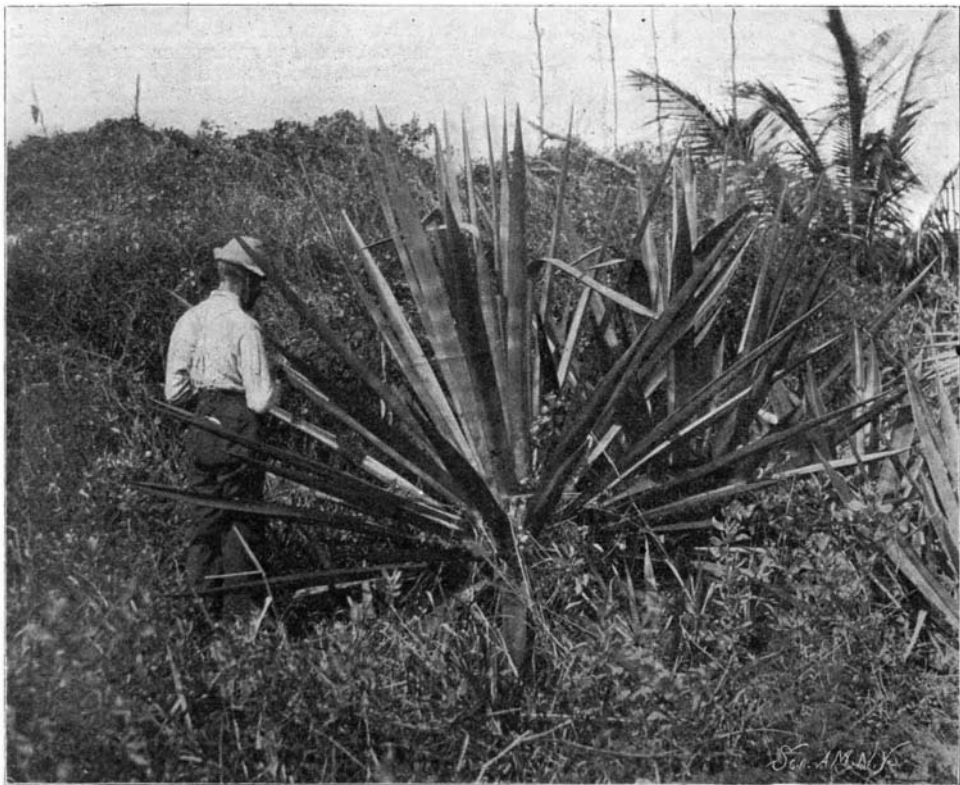


FIG. 1.—FLORIDA SISAL HEMP PLANT OVER SEVEN YEARS OLD.

recent visit to Yucatan the writer was enabled to study the growth of the Sisal hemp product, *Agave rigida*, under most favorable conditions, and to learn some new points in relation to the commercial side of the fiber production, which are worthy of record. Reference is made in this connection to the treatise on *Agave rigida* (varieties) in the Descriptive Catalogue of the Fiber Plants of the World, published by the Department of Agriculture.

At least 70,000 tons of Sisal hemp finds a market annually in the United States for the manufacture of cordage, these figures not including cordage and other manufactures from Sisal also imported. About eight years ago the price of the fiber was three and a half to four cents per pound, while now the best grades bring ten cents, the American and European demand for the fiber being so large that the hemp farms around Merida have become veritable "gold mines."

The preparation of the fiber for market is a simple proposition, though the establishment of a new plantation is a question of years. The stiff, sword-like leaves of the plant are a mass of epidermis and pulp, in which the straight, creamy yellow fibers are embedded, these serving as the "bones" of the leaf structure. The lower and older leaves are cut close to the head, tied in bundles, piled upon little flatcars and run to the factory over diminutive narrow-gauge railroads which extend to every part of the farm. At the factory the bundles are sent up to the machine platforms by endless carriers and dropped upon the

it grows in a semi-wild state in southern Florida. Fig. 2 shows the cultivated plant in Yucatan when it is (nominally) "five years old," this being the age at which the leaves are first cut for fiber. It should be explained, however, that the ages of the plants in cultivation are calculated from the time when the root suckers are set out to form a new plantation, at which time these suckers may have been growing three years or more, uncared for, before transplanting. So a field of five-year-old plants may, in reality, be eight or nine years old, at which stage of growth from the baby plant the leaves are considered fit to be taken for fiber.

From the age of five years and upward—from the date of transplanting—to the time when the plant blossoms, and dies, twelve to fifteen leaves may be taken off annually for the extraction of fiber. These leaves are about four and a half feet long, four to five inches wide and a quarter of an inch in thickness, and weigh from less than one pound to over two pounds each. In Yucatan the conditions of soil and climate are such that a plant may live to be twenty, twenty-five or even thirty years old before blossoming; while some, it would appear, never blossom, as very old fields were seen by the writer where the plants were simply drying up and dying of old age. Fig. 3 shows the appearance of old plants in Yucatan, those photographed being fifteen years old from transplanting.

In southern Florida, where the Sisal hemp plant was



FIG. 2.—FIVE-YEAR-OLD YUCATAN PLANTS.



FIG. 3.—OLD YUCATAN SISAL HEMP PLANTS.

feed tables. The leaves are then fed, one by one, by a Maya Indian attendant, into the grip chains of the machine, these endless chains conveying them to the scraper wheels, where the fiber is extracted and cleaned automatically in an instant, the same chains

introduced as an experiment nearly seventy years ago, I have never seen a plant with a definite trunk as in Fig. 3, the blossoming always occurring when the plants are under ten years old (from the first inception, for they are not cultivated in Florida, and

standpoint of their personal interests and as a money proposition, for it will make some difference with the profits of a venture whether the life of the plantation, after coming to maturity, is to be twenty years or only three or four years.