

TOBACCO RAISING IN THE PHILIPPINES.

BY HAMILTON WRIGHT, SPECIAL COMMISSIONER IN THE ORIENT OF THE PACIFIC COMMERCIAL MUSEUM (WITH PHOTOGRAPHS BY THE AUTHOR).

Save for some little statistical information regarding the tobacco manufactories of Manila, less is known in America of Philippine tobacco than is known of it either in Europe or Asia. Nine-tenths of all the tobacco raised in the islands, and practically all that is used commercially, is produced in the vast Cagayan valley of central and northern Luzon, a region of which even many Americans in the islands have little first-hand knowledge. The valley is out of the general line of travel, and attention was not directed to it during the insurrection; its people were "pacificos."

Yet here is one of the most fertile valleys in the Philippines. Perhaps it is among the richest in the world. For a period of more than one hundred and forty years tobacco has been raised on the overflowed lands of the valley without artificial fertilization. It is the custom of the Cagayanes to raise one crop of tobacco and one crop of corn on the same land in one year. In two succeeding years two crops of tobacco and three crops of corn have been produced from the same soil. The Rio Grande de Cagayan, from which the valley takes its name, is the largest river in the Philippines. It is at once the Nile and the Mississippi of the archipelago. Rising in the Cordillera mountain range of central Luzon, the backbone, as it were, of the great island, the Cagayan flows north for a distance of 225 miles as the crow flies, until reinforced by many large tributaries, it at last empties into the China Sea at Aparri, the northernmost port of Luzon.

The purple-peaked Cordilleras gradually widen to make way for the huge river, forming the east and west boundaries of a vast grassy plain almost two hundred miles long and with an average width of between thirty and forty miles.

The bulk of the tobacco in the Cagayan is raised like so much hay. Little attention is given to the details of curing and harvesting, which in the case of so intricate a crop demand both scientific and experienced treatment. Most of the good tobacco land is the overflowed land, which consists mainly of small pockets, belts, and patches, with occasionally greater areas of level land lying along the bed of the Cagayan River and its tributaries, and which doubtless formed the bed of the river at an early period. At the end of the rainy season during the latter part of December the northeast monsoon blows up the river from the China Sea, causing the water to rise, when a freshet occurs, as much as twenty feet in as many hours. It overflows the ground to a depth of two or three feet. With the lull of the wind in a few days this back-water recedes, and a heavy deposit of silt is left on the land.

a carabao plow. The carabao covers but one-fifth of an acre a day. It usually takes three or four plowings to get the ground into condition for planting. The plow itself is a primitive affair made from the crotch of a tree. It goes but four inches deep, and moves so slowly that it does not "turn" a furrow. Such a thing as seed selection is unknown to the majority of natives. "Topping the plants," or nipping off the higher stems to force vigor into the leaves, is usually disregarded. Cutting off the "suckers" is seldom practised. After the tobacco is dried it is often strung under the dwell-

best tobacco land is a small fortune to the natives. The average family lives by less than a hectare (2.47 acres) of land. The whole family helps in the work. Almost all of the working population of the valley is connected with the industry in some way or other. Though most of those engaged in tobacco production are small owners, there are half a dozen large firms operating in the Cagayan valley, the Spanish and German firms predominating. The largest corporation is the General Tobacco Company (Compañía General de Tabacos de Filipinos) which was established in 1882.

Little actual capital, it is said, was invested in the undertaking, but to-day this company is without question the most powerful corporation operating in the islands, whose revenues are derived there. It is capitalized for \$17,000,000 (gold) on which it pays generous dividends.

There is but one American company, the Philippine Plantation Company, in the valley. This company is deserving of notice here as the largest, and practically the first American agricultural corporation of any size that has actually cultivated the ground on an extended scale since the American occupation. The company purchased the old Maguigad estate of 44,000 acres, near Tuguegarao. It has erected modern buildings on the plantation, which is provided with the equipment of an up-to-date tobacco estate. Lieut. Schermerhorn, the manager, had a considerable area in tobacco this year, which was his first season. Next spring it is hoped to have a 5,000-acre crop, which will be the largest single planting in the valley. The future of this plantation will be watched with interest by the government experts

and others who are anxious for the success of modern methods of agriculture.

Philippine tobacco is sold in thirty-five different countries. From Canton to Peking the most expensive and also most generally sold cigarette comes in a package of Manila tobacco put up in Austria. Manila cigars are the most popular in Japan and sell at 30 sen (15 cents American money) though the Japanese government itself maintains a tobacco monopoly. But the value of the Philippine tobacco crop sinks into insignificance when compared with the world's increasing supply and demand.* The value of the tobacco manufactured in the Philippines in 1905 is estimated at \$5,494,627.† \$892,561 worth of cigars and \$14,250 of cigarettes, or a total of (manufactured tobacco) \$906,811, and \$1,374,892 of leaf tobacco (manufactured) was exported. \$3,212,924 worth of manufactured tobacco therefore remained in the islands. Besides this a presumably enormous quantity of leaf of an inferior grade was sold or traded to natives of the Philippines, who often roll their own cigars before smoking. When manufactured in other countries the unmanufactured



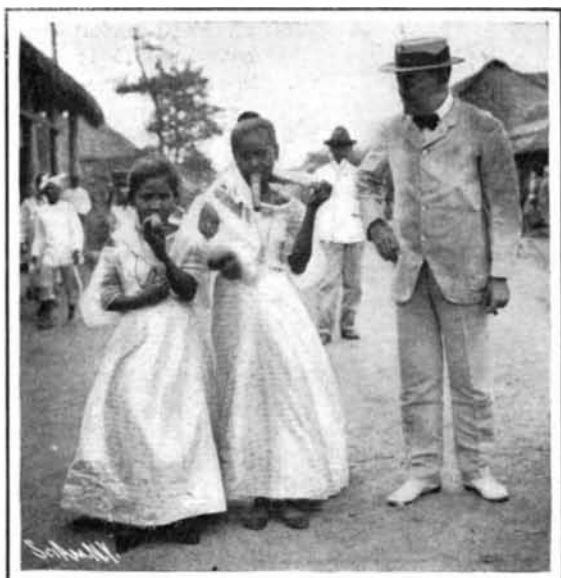
Loading Baled Tobacco on a Scow.



Philippine Precocity in the Use of the Tabaco Grande.

ing among the pigs, chickens, and carabao. When the leaves are picked they are cured in the sun, but frequently are allowed to mold and mildew afterward, thus bringing them down to the fourth or fifth grade. It is the curing which largely determines the grade, and consequently, the price of the tobacco. Only the large plantations have curing sheds.

Despite the many drawbacks in cultivation and curing, a very fine grade of tobacco is produced in the Philippines. At the Hacienda San Luis of the Tabacalera Company some wrapper leaf is being raised under shade. Señor Orres, manager of the plantation, claims that it is not surpassed by any leaf tobacco in the world. Prof. Lyon, of the Insular Bureau of Agriculture, believes the Cagayan valley equal to the famous Vuelta Abajo district of Cuba. But most of the tobacco is of inferior grade. It is spoiled in the curing. Even with free trade with the United States it is doubtful if tobacco of fine grade will be raised in sufficient quantities to make it a formidable competitor in American markets. It will take years to educate the people to raise and cure it properly. One-fourth the



Judge McCabe of Tuguegarao and Two Young Ladies Whom He Met in the Market Place One Sunday Morning as They Were Returning from Mass.



Hauling by Carabao (Water Buffalo), the Most Common Method of Transportation in the Philippines.



Loading Tobacco in a Banquelia for Shipment Down the River.

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On the overflowed land tobacco is planted during the latter part of January or early in February, while on the high land it is planted several weeks earlier. In three months the plant has reached a height of from four to six feet. The leaves begin to get yellow in spots and curl back. It is ripe.

It is interesting to note how the native raises tobacco. Before transplanting to the high or the overflowed land, young tobacco plants have been grown thickly in a seed bed. When they are six or eight weeks old they are transplanted to soil which has been crudely scratched during the time of their growth by

present area in tobacco with greater attention would yield better returns than the present careless cultivation.

In contrast to the former government monopoly, today in the Cagayan the people own and control their own farms. In the province of Cagayan there is a population of 142,000, with 23,000 land owners. With five to a family, and excluding middlemen, it seems fair to assume that almost every farmer owns his own land. A similar condition holds good in the province of Isabella, south of Cagayan province, which includes the rest of the tobacco land. A very small plot of the

tobacco brings from thirty to fifty times its selling price.

The greatest consumers of Philippine tobacco are the Filipinos themselves. With a population of

* In the United States alone 440,000,000 pounds of tobacco are consumed annually. Germany ranks next with a consumption of 201,783,000, Russia 150,244,000, France 84,393,000, United Kingdom 83,378,000.

† This estimate is, presumably, much lower than the actual amount of tobacco manufactured. When, for instance, for purposes of revenue the value of tobacco manufactured is classified at less than \$25 and more than \$10 per thousand cigars, for the purposes of this article the value has been taken at but \$10 per thousand cigars.

over eight millions, practically all of whom, even the non-Christian tribes, are incessant smokers, usually including women and children as well as men, and with many districts where tobacco is not raised for family consumption, the consumption of tobacco must be many times the value of the export. In the Cagayan a most unique custom prevails among the women, who smoke a huge cigar, the *tabaco grande*, which reaches a length of from thirty inches to three feet and is several inches in diameter. These huge cigars are smoked off and on for a day and a half or two days. Sometimes a *tabaco grande* is suspended in the middle from a rafter in the dwelling, and all the women folk of the family puff in turn. The men smoke the cigarettes or the ordinary-sized cigar.

When the railroad projected through the heart of Luzon to connect Manila and Aparri is constructed, the tobacco industry will be immensely stimulated by the attention directed to the Cagayan. In the event of free trade the industry will profit not so much through enlarged markets in the United States (for there is always a demand for all good-class Philippine tobacco) as through the stimulus given to the importation of modern machinery and the feeling of encouragement given the islands generally.

A Rubberless Pneumatic Tire.

Experiments are being carried out in London upon a 15-horse-power automobile and a few heavy mechanically propelled vehicles with a new material that has been evolved as a substitute for pneumatic tires. As is well known, although the latter type of tires possesses great resiliency, conducing to complete comfort in riding, its liability to puncture is a decided disadvantage. In this new tire the resiliency of the pneumatic tire is retained as much as possible, while puncturing is completely obviated. "Elastes," as this new material is called, comprises a mixture (in predetermined quantities which vary according to the type of vehicle to be fitted, the nature of its traffic, and the roads upon which it is designed to ply) of three substances—glue, glycerine, and chromic salts. These are dissolved and mixed at a high temperature and while in the liquid condition are injected into the inner tube of the tire. The compression of the material and consequently its density also fluctuates according to the foregoing conditions.

For filling, the inner tube is mounted *in situ* upon an ordinary tire rim with the outer cover in position. The inner tube is provided with two valves—one through which the "elastes" is injected, and the other for the escape of the dis-

placed air. When filled the tire, intact, upon the temporary rim and with the outer cover in position, is set aside for several days to set. It can then be mounted upon the wheel in the usual way. The inner tube is set in position in the rim with a protecting cover of canvas glued on the tread. The outer cover is stretched and secured in the rim as usual. It is claimed that "elastes" will retain its consistency under all variations of load and temperature and is not deteriorated by wear. It has no tendency to harden or disintegrate, and in fact so long as it is not ex-



Stevedores Posing for Their Pictures and Incidentally Getting a Breathing Spell.

posed to actual friction can be used over and over again. The one disadvantage that it possesses is that the weight of the car is increased from 20 to 40 pounds per wheel; against this, however, must be set the weight of spare tires which have to be carried under ordinary circumstances. Those who have submitted their cars, with wheels shod in this manner, to practical tests state that the tires thus filled are in every way as comfortable and resilient as the ordinary pneumatic tires.

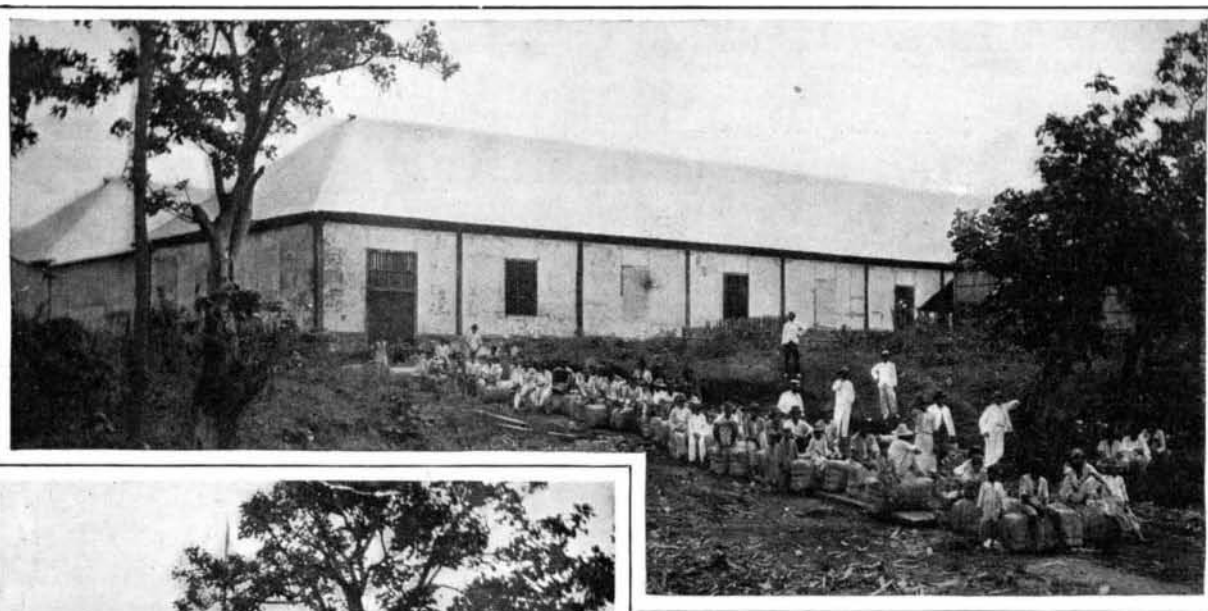
Prof. A. Agassiz's Scientific Cruise.

The steam yacht "Virginia," chartered by Prof. Agassiz for a scientific cruise to the Windward and

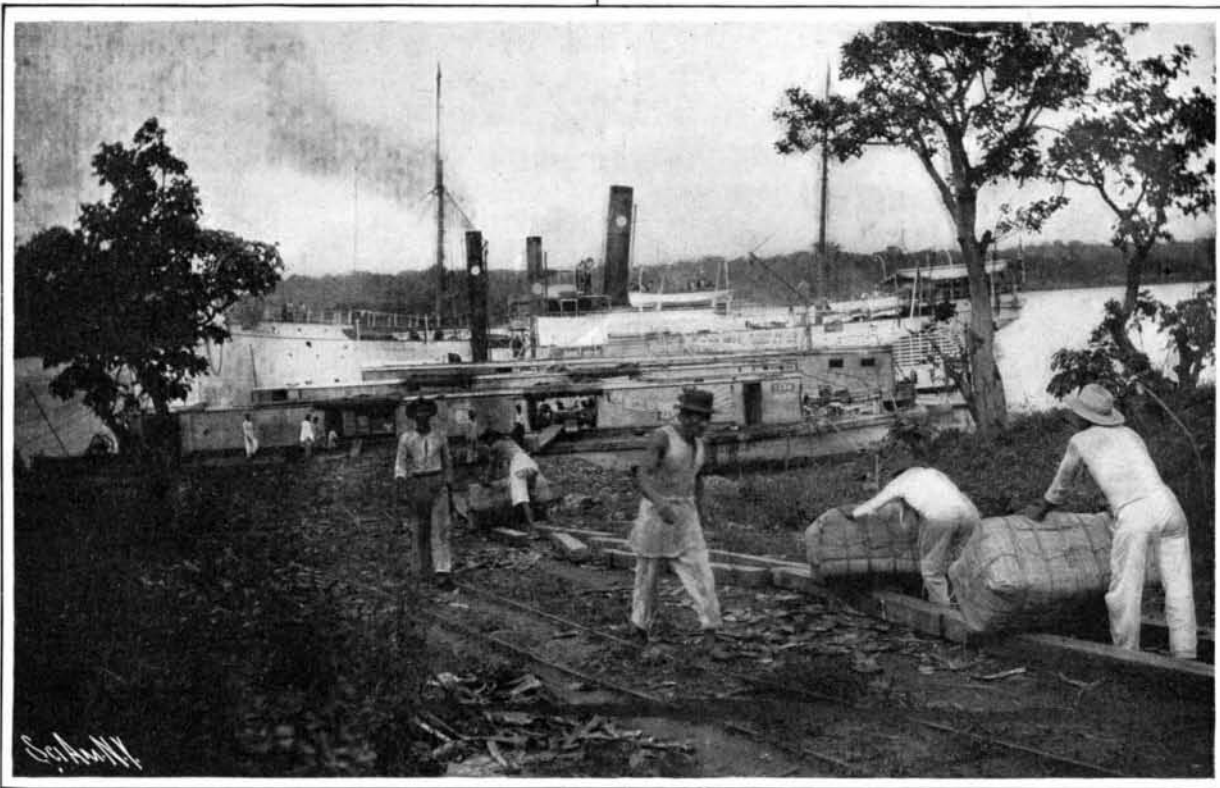
Leeward Islands, started on its journey on February 5. To sound and dredge the depths of the sea, to study ocean temperatures, the superficial and submarine currents, are the objects of the voyage. The subject of seismic disturbances, especially in the neighborhood of Jamaica, and of the known seismic area of the recent earthquakes, both on land and seaward, will be carefully investigated. A great change is expected to be found in the soundings about the island of Jamaica. The violent disturbances of the earthquake have caused islands to appear in the Pacific, which later sank thousands of fathoms, with a subsequent settling of the ocean bed. Water-spouts, too, will receive the attention of Prof. Agassiz and his staff. These spouts, Capt. Howland Patterson states, have been known to pursue a straight path for several minutes, then to curve suddenly, and again to rush off at a right angle to their former course. Such water-spouts have foun-dered good-sized vessels.

Prof. Agassiz commenced scientific investigations in 1859. In that year he went to Acapulco to collect specimens for the Museum of Comparative Zoology at Harvard. He then took up coast survey work in California, where he became a mining expert. He explored the west coast of South America in the early seventies, and sent tons of specimens to the Peabody Museum. He spent five years in deep-sea dredging on board the steamer "Blake," a vessel which the United States Coast and Geodetic Survey placed at his disposal. On his return from his cruise on the "Virginia," Prof. Agassiz expects to be able to add much valuable information to that already possessed by science.

Dr. F. V. Darbishire, of Manchester, and Dr. E. J. Russell, of Wye, Kent, dealt with the "Oxidation in



Loading Baled Tobacco from the Giant Warehouses at Lalloo in Waiting Steamers on the Cagayan River. Machinery Will be Used Some Day.



Loading Steamers with Baled Tobacco at Lalloo on the Cagayan River Fifteen Miles from Its Mouth.

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Soils in its Relation to Productiveness." before the British Association for the Advancement of Science. All soils, they pointed out, possess the power of absorbing oxygen. They constructed an apparatus to measure the rate of this absorption. The power is mainly due to micro-organisms, but as it continues to about one-fifth of its original intensity in soil sterilized at 120 deg. C. or with mercuric chloride, it cannot be ascribed entirely to micro-organisms. Moisture is essential to oxidation; water-logging stops it; sugar and carbonate of calcium increase the oxidation rate; certain poisons, even mercuric chloride and copper sulphate, increase it likewise, if not present to more than 0.01 per cent. Soils partly sterilized by volatile antiseptics, like chloroform and carbon bisulphide, or by heating up to 95 deg. C., show an improved rate of oxidation, to which greater productiveness corresponds. These results hardly appear consistent, but microbes bear a good deal, and may bear more still when living in the soil.