

THE HAWAIIAN
PLANTERS' MONTHLY

PUBLISHED FOR THE
PLANTERS' LABOR AND SUPPLY COMPANY
OF THE HAWAIIAN ISLANDS.

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LATEST quotation for Cuban centrifugals of 96 deg. test was 3.25. Hawaiian rice 4c. Kona coffee 20c., with none in the market. Flour \$3.35 @ \$2.40.

THE sugar planters of Cuba are in a deplorable financial situation and bankruptcy is inevitable to nine-tenths of them. The planters claim that without concessions or an advance in the price, another year will see a state of affairs direful and disastrous even to the most prosperous Cuban planters.

THE sugar consumption of the United States for the first half of 1895, as compared with the same six months of the four preceding years, is 849,355 tons for 1895, against 892,116 tons for 1894, 907,625 tons for 1893, and 821,392 tons for 1892. The decrease this year is 43,761 tons.

MR. RICHARD GIRD, the head of the greatest beet sugar factory in the United States, is reported to have lately said in an interview, that "had it not been for the promise of assistance and protection, there would not be a beet sugar factory in the United States at present."

No rule for all can be laid down; but it would be well for most people in the intensive days in which we live to devote eight hours to the cultivation of the mood and act of sleep, and to resist the domination of all habits and fashions that are inconsistent with this purpose.—*The Lancet*.

Borax (pulverized) sprinkled plentifully around the haunts of water-bugs will drive them away. Cockroaches also will yield to this treatment, and depart for other pastures. Sprinkle places infested by ants with borax and you will soon be rid of them.

AUSTRALIA SUGAR PRODUCTION.—The Sugar Journal of Mackay, Queensland, says: Roughly put, the probable output will be Queensland, 110,000 tons; New South Wales, 30,000 tons; and Fiji, 30,000 tons, or a total of 170,000 tons. The consumption of Australasia may be put down at 160,000 tons.

THE par of sterling exchanges in New York is \$4.86-65. The actual business rate of demand sterling bills at which gold coin can be exported to London without loss on regular commercial account is about 4.88 for bars and 4.89 for coin, and the rate for which it can be imported without loss is 4.83½.

THE beet crops of Europe are by no means secured in estimated amount, says Willett & Gray's Statistics. For four succeeding weeks Mr. Licht has reported unfavorable weather, which means less sugar in the beets than last year, which together with less acreage may mean a much more serious deficit than yet anticipated.

“Louisiana and Ohio,” says the *St. Louis Republic*, “are noted localities for petrified trees. In the former state, several years ago, in turning up the ground an ancient forest was unearthed, and in succession two others below the first. Scientists, judging from the state of the trees, say that at least 50,000 years have elapsed between the growth of the first and last forest.”

SUGAR cane does not seem to thrive in San Joaquin valley where its cultivation has been undertaken by authority of the Government. From the experience thus far it would appear that the nights are too cool early in the season and the cane is of very slow and unsatisfactory growth in the spring, thus making the growing season too short for the proper maturity of the cane before winter.—*California Fruit Grower*.

THE PLANET MARS.—“To sum up, now, what we know about the atmosphere of Mars: we have proof positive that Mars has an atmosphere; we have reason to believe that this atmosphere is very thin—thinner at least by half than the air upon the summit of the Himalayas—that in constitution it does not differ greatly from our own, and that it is relatively heavily charged with water vapor.”—*Prof. Lowell in Atlantic Monthly*.

COMPETITION between steam and electricity for railroad traction is seriously embarrassing steam roads, which are nearly all burdened with overcapitalization and bonded indebtedness, and some of which have nearly exhausted their borrowing capacity. One of the most profitable branches of their business, says the *New York Times*, is the passenger traffic between large cities not remote from each other, and it is just at this point that the competition of the trolley roads bears hardest.

THE *Literary Digest* translates from the *Journal d'Hygiene* for June 20th, the following account of a natural weather-glass: “If you follow the movements of a leech in a bottle containing about a pint of water, and covered with a piece of muslin, you can have a pretty good barometer. The leech lies rolled together at the bottom of the bottle—*fair*. It comes to the surface of the water—*variable or rainy*. It rushes pretty rapidly about the bottle—*strong wind*. It rolls over and over convulsively—*storm*.”

CANADA'S INCREASED SUGAR DUTY.—Unlike the United States the Canadian Government never gives notice in ad-

vance of tariff changes. While a duty on sugar has been looked for, yet it was only on a certain day that the fact was made known of an increase of $\frac{1}{2}$ ¢. per lb. duty on raws and refined. The effect as far as the United States refiners are concerned is to leave the lower grades of raws free from Canadian competition, as it is to their advantage to use only the highest testing sugars for refining.

Taking the famous old merchant vessel Great Eastern as a familiar object of comparison, the inquirer will find the following tables full and complete for the vessels which it is desired to place together :

<i>Name.</i>	<i>Length.</i>	<i>Beam.</i>	<i>Displacement.</i>
Great Eastern	680 feet	83 feet	24,000 tons
Campania	600 feet	65 feet	18,000 tons
St. Louis	535 feet	63 feet	16,000 tons
Paris	528 feet	64 feet	13,000 tons
Teutonic	565 feet	57 feet	12,000 tons

IN Elmira, N. Y., a city of 35,000 inhabitants, there are 250 grocers, and of this number about 200 have licenses to sell liquor. This means one grocery for every twenty-eight families, or one for every 140 persons. No wonder competition in Elmira is fierce. It is difficult to understand how so many grocers in so small a city can pay expenses. It probably accounts for the great number of liquor licenses. One saloon to every thirty-four families is enough to ruin the fairest city on the footstool.—*American Grocer.*

GOVERNMENT AND INSURGENTS' FORCES IN CUBA.—At the outbreak of the insurrection there were about 10,000 to 12,000 soldiers in the island and the number has since been increased to 55,000, and Marshal Martinez Campos has called for 30,000 more, who will arrive previous to September 30, and assuming that 5,000 to 6,000 are already either dead, wounded or sick, the commander-in-chief will be able to dispose of 80,000 men, to take the offensive and assume active operations early in October, as soon as the rainy season be over.—*Havana Correspondence Louisiana Planter.*

WORMY CANE.—Louisiana has always been exceedingly fortunate in an almost entire exemption from insect ravages of

cane, while in other cane growing countries the loss from this cause amounts to thousands of dollars annually. True, we have had a black beetle which ravaged the young cane on a few places—notably the Sterling plantation in St. Mary parish—and grub worms more or less on all places, but these pests have been much less troublesome since planters began to burn their cane tops and trash instead of plowing them under. This should always be done.—*Louisiana Sugar Cane.*

HOW MANY EGGS HAD SHE? Some mighty intellects in Germantown are now wrestling with the following problem: A woman took a basket of eggs to the city for sale. Upon being asked how many she had, she replied: "If I take the eggs out of the basket two at a time, I have one egg left. If I take them out three at a time I have one egg left. If I take them out four at a time I have one left. If I take them out five at a time I have one left. If I take them out six at a time I have one egg left; but if I take them out seven at a time I have none left in the basket." How many eggs had she in the basket?—*Philadelphia Record.*

FARMER BINKS—"I met a woman to-day that I thought a good deal of once." Mrs. Binks—"Oh, you did?" "Yes. I used to do my very best to please her." "Humph!" "I did everything I could to win her affection." "My goodness!" "And at last I succeeded." "What—" "She granted all that I asked, and by so doing made me the happiest man alive." "Merciful—" "I asked her to come right up to the house with me to-day, but she had some shopping to do, and cannot get here until supper-time." "Mr. Binks, I am going right home to my mother." "She isn't at home, my dear. It was your mother that I met. She gave me you."—*New York Weekly.*

ON the last page of this issue will be found the list of committees appointed to report at the annual meeting of the Planters' Association. No date has been set for the meeting, but it has usually been held in November. It is hoped that there will be a full attendance, and that reports will be received from each committee, and from any others who

desire to contribute articles of general interest. Persons who have had experience in other branches of industry than sugar and coffee, particularly in any of the minor industries, suited to persons of limited means, are specially invited to present their views, either in person or through any of the officers or members. Much attention has been attracted abroad to the islands, as a desirable place for residence and for the investment of capital, and to furnish information to such inquirers is what is desired. It is hoped that every member of each committee will contribute something of interest at the coming annual meeting.

EUROPEAN CONSUMPTION OF SUGAR. The total consumption of sugar in Europe is placed at 3,357,000 tons for the year ending June 30, 1895, an increase over the preceding year of 179,000 tons. Great Britain consumed 1,481,000 tons; Germany, 638,000 tons; France, 547,000 tons; Austria, 373,000 tons; Holland, 52,000 tons; remaining principal entrepôts, 266,000 tons.

The total stocks of sugar in the chief markets of Europe on June 30 were 1,102,000 tons, against 591,000 tons, same date, 1894, and 523,000 tons in 1893.

During the year ending June 30, 1895, the United Kingdom imported 7,028,031 cwt. of refined sugar, of which Germany furnished 4,535,230 cwt. and the United States only 9,207 cwt.—*Exchange*.

SUBMARINE GARDENS.—A delightful glimpse of the gardens under the ocean is given in an article by Mary F. Honeyman in *The Chautauquan* for June. The method of viewing them is thus explained: A sea-glass or water-glass is simply a sort of rough wooden box, without a cover, perhaps a foot to twenty inches square, the bottom consisting of a piece of clear glass. It is grasped firmly by the edge and held so that the bottom is just below the surface of the water. By its use the rippling movement of the water is overcome and one is enabled to look steadily downward, apparently to the sea-floor itself, and to see every smallest object quite as plainly as we see the things about us in the upper air. Our first glimpse gave us the impression that the glass was

possessed of magical power, and we gazed spellbound into the new world of grace and beauty revealed to us by its small transparent square. Gardens they are, to be sure. Scarce a tree or shrub or flower that our land-gardens boast but is here reproduced in colors varied and beautiful and forms of airiest grace.—*American Grocer*.

GOLD THE BEST STANDARD.—Money is that portion of the wealth of any nation that aids in the making of exchanges. That nation doing the greatest business is the most educated nation. Real money is coin in our day. Years ago it was made up of cattle, tobacco, etc. As mankind developed, a more valuable article was needed to use in our commodities. We can have but one standard of money at one time, and thus we select that which is most convenient, most preferable, and that is gold. A man naturally takes that commodity which he can obtain with the least effort. The bankers of London do the business of the earth, while the bankers of the United States ought to do it. We have had calamity after calamity, while England has had nothing of this sort. Did you ever hear of a citizen in Australia sending his money to New York? No. He sends it to Great Britain. Why? Because he knows the standard of value there is always maintained. He knows that if he deposits his money in Great Britain in January of this year he can draw it out in full value in December of eternity, if he cares to leave it that long.—*Congressman M. D. Harter*.

The *Washington Pathfinder* recently offered a prize for the best original history of the United States in 100 words. Out of 911 contestants, the prize was awarded to W. T. Gooden, of Pana, Ill., for the following: "The revival of learning, commercial rivalry and religious zeal in Europe led to Columbus's discovery of America in 1492. Conflicting territorial claims and parental animosity involved English, French and Spanish colonists in wars culminating in English supremacy in 1763. England's oppression alienated colonial affection, induced revolution, hastened independence. Common cause and danger begat colonial union; the weakness of the Confederation demanded a Federal Republic. Party

differences tempted legislation. Negro slavery precipitated civil strife, secession, emancipation. Federal authority supreme, reorganization succeeded. Religious freedom, an unmuzzled press, invention, internal improvement and universal education have conspired to prosperity at home and honor abroad."

AMERICAN BEET SUGAR INDUSTRY.—The beet factories of California show extraordinary results for the season of 1895. The two principal plants—Watsonville and Chino—will have all they can do, working night and day, till the close of this year, to secure the splendid crops which are now being harvested. At Chino, which is located farther south than her rival, and enjoys a warmer and better locality, the factory work commenced July 10. It has the advantage of being in a dry valley, where work can go on day and night without interruption. The total sugar crops at Chino will probably be not less than eleven or twelve thousand tons of choice grades. Watsonville's outcome will be about the same of dark sugar, but it requires a longer time to manufacture. The success that has attended these two enterprises demonstrates the fact that beet sugar will before many years become a leading industry of California and other Pacific Coast States, as far north as Puget Sound. Recent advices from Chino show analysis of beets ranging from 20 to 25, with purity of 82 to 88. These extraordinary results will attract attention, and give a spur to the American beet sugar industry.

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*LETTER FROM BOSTON—THE SUGAR TRUST AND
ITS AGENTS—ELECTRICITY APPLIED TO
TRUCK GARDENING.*

BOSTON, MASS., August 12, 1895.

EDITOR PLANTERS' MONTHLY: Relations appear to be somewhat strained between the Sugar Trust and its agents, the wholesale grocers. The understanding between the Sugar Trust and the wholesalers is of some years standing. It was formally completed in September, 1892, by which the Trust fixed the price which the jobber should sell to the retailers,

and fixed the rate of profit which he should receive for his trouble.

When one-eighth of a cent was found to be a margin hardly liberal enough to bind the wholesalers to the interests of the Trust, the rebate was raised to three-sixteenths of a cent per pound, which, with one per cent. discount on one hundred barrel lots, and one per cent. cash discount, represented on the low prices of sugar which have lately prevailed a very comfortable margin. In fact, some of the wholesale grocers have been doing so well on their sugar trade that a number of them have felt disposed to give their customers some of the benefit of their own margin of profit.

The tradition of sugar being a "leading article" in the trade has not quite died out, and the old habit of cutting its price for the sake of securing orders for other articles, comes rather naturally to grocery salesmen. So, in the most natural way, cut rates for sugar appeared in the West—not in New England—and the South, also, and Eastern jobbers, to save their trade, had to meet the competition and make a cut also. But competition of that form was precisely what the Trust was organized to prevent, and a system which admits of the prevalence of lower prices than Trust prices is a system to be amended.

Thus it now transpires that the combined ingenuity of the Trust managers and their agents, the wholesale grocers, is being devoted to the task of devising a plan which will visit with appropriate punishment any secret cutting of prices. The plan being considered is that of making consignments instead of sales to wholesale grocers, and so placing the jobbers in the ranks of agents, acting for the Trust, on a stipulated commission.

At the experiment station at Amherst, Mass., Professor Warner is trying the direct application of electricity, furnished by a dynamo, to the plant itself and to the soil in which it grows. He has prepared two plots of ground, side by side, six feet by twenty feet long. To compare plants to grow by electrical aid with those raised according to the natural method, one of the experimental gardens, is furnished with electricity, and the other is without it. The soil is a rich loam, and that in the electric garden is surrounded with

a timber frame, on which are arranged numerous porcelain insulators, a few inches apart, holding a continuous uncovered copper wire. This copper wire crosses the garden as many times as there are insulators on either side. The whole frame-work thus fitted looks like the stringed frame of a piano. The wires are covered with earth to the depth of two inches, and in both gardens various vegetables have been planted from time to time. These plants are so arranged that the rows in the electrical garden are continuous of those in the non-electric, in order that the contrast of development may be more easily noted after applying currents of various strengths. It was found that a certain flow of electricity through the electrical garden produced strange results. Many varieties of seeds sprouted much more rapidly, and many plants blossomed much earlier than in the other. Roots of certain vegetables, and the tops of others were found to be greatly enlarged under this process. In fact, all the plants were found to be greatly stimulated by a current of certain strength.

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THE ASIATIC CHOLERA AND OTHER EPIDEMICS IN HAWAII.

This dreaded scourge has at last reached this port, brought hither by a steamer from China and Japan early in August. The change from its ancient habitat, to one of the mildest and healthiest climates in the world, so modified its well-known symptoms that many hesitated to acknowledge it to be the Asiatic cholera, preferring rather to term it sporadic cholera, which is understood to be a milder form of the epidemic. The first case on the shore was discovered about the 18th of August, and to September 16th, there have been in this city 82 cases, of which number 58 have proved fatal. Up to this writing it has been confined to this island and city. Every effort is being made by the Board of Health and physicians, aided by the citizens, to restrict it to its present limits, and by the most vigilant means to stamp it out. Of the 82 victims that have had cholera, 72 have been native Hawaiians.

It may be interesting in this connection to refer to some of the epidemics that have visited these islands, and been the cause of reducing their aboriginal population from 400,000 which was Capt. Cook's estimate in 1776, to their present number of about 40,000.

The first of which there is a tradition occurred in 1804 or 5, and was named the *mai okuu*. Judge Andrews in his Hawaiian Dictionary, says of it: "This is the name of a great pestilence which swept over the islands, while Kamehameha I was living on Oahu about 1807. Great multitudes were swept off. The name *okuu* was given to it because the people *okuu wale aku no i ka uhaue*, i. e., dismissed freely their souls and then died."

Dibble, in his history, page 72, has the following reference to it: "After this he (Kamehameha) removed to Oahu, where he was seized by the malignant epidemic, then common, from which he recovered, but which proved fatal to a multitude, and some say, the majority of his subjects."

Alexander, in his history, page 153, says: "After Kamehameha had made vast preparations for the invasion of Kauai, and had collected an overwhelming force, a pestilence broke out among his troops, which spread through the island, and carried off half the population. * * * It is believed by many to have been the cholera."

Jarves, page 89, says that the King had seven thousand warriors, and that before he could embark for Kauai, an epidemic broke out among them, of a peculiar character, which spread over the island and proved very fatal. Three hundred dead bodies are said to have been carried out to sea from Waikiki and buried in the ocean.

The natives of this day have a tradition that many thousands of bodies were buried at sea, as the only way in which they could be disposed of. The mortality was doubtless very great, and to this epidemic is justly attributed a large decrease in the population of the group.

In 1848, the measles were introduced from California, and spread throughout the islands. Also the whooping cough. The mortality from these diseases was very great, some estimating that one-tenth of the population died.

In 1853, the first case of small-pox was brought to these islands, which was at once taken charge of, quarantined, and no other case appeared, until three months later, it broke out in Mauna Kea street, originating in a lot of old clothing received from San Francisco. This rapidly spread over Oahu, and only a few cases appeared on Maui, Hawaii and Kauai. The total deaths from the disease were about 3000.

In 1872, and again in 1881, this disease re-appeared. In the former year there were but thirty-seven cases and eleven deaths. In 1881, there were 789 cases, of which 289, or about one-third, were fatal. It lasted for *eight months*, during which time a rigid quarantine of passenger traffic with the other islands of the group was kept up. During its prevalence much hardship was endured, and a general stagnation of business prevailed.

It is probable that a very large majority of the native race died in these epidemics, particularly in the first, of which no written record has been kept, only the bare fact of its having occurred. That the king should have resorted to burials at sea shows how destructive of life it was. It stands as a precedent, which should never again be resorted to.

Reference has been made to Kamehameha's preparations to fight the King of Kauai and annex that island to his domain. He commenced his preparations in the year 1801, and they occupied two years. He enlisted and drilled seven thousand Hawaiian warriors and fifty whites, the latter armed with muskets. The warriors carried spears and heavy clubs. Specimens of both these weapons may be seen in the Bishop museum. In addition he had forty swivel guns, six mortars and a large quantity of ammunition. To convey this army he brought into his service twenty-one schooners from ten to fifty tons each, some of them armed with guns, and commanded by foreigners, and a vast number of large canoes, some of them double and of immense size, tradition says over four hundred. In addition to all these, he had purchased a ship, which had been ashore, and was probably saved by his soldiers. This ship is said to have carried twenty guns. Altogether it was a very formidable force, and well illustrates the resources and power of this great man, who has justly been called the "Napoleon of the Pacific." The

death of the King of Kauai soon after the epidemic referred to above, and the voluntary surrender of his successor to Kamehameha, resulted in uniting the whole group under his sway. It may be that the great cholera epidemic of 1804 had some influence in bringing about this happy result.

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THE BOARD OF HEALTH AND THE EPIDEMIC.

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The Government, through its board of health, has acted with a promptness and vigor in its efforts to suppress the cholera disease, introduced last month from China or Japan, which deserves commendation. Had it been known at the time when the vessel which introduced it was in port, that she had the disease on board, it might possibly have been kept from spreading among the people, who in some way contracted it. Though if it came in the freight landed from her, the fact could not possibly have been ascertained in time to prevent its spread.

When the small-pox was introduced here in 1853, and nearly three thousand perished, it was believed to have been brought in a lot of second-hand clothing which some person, either for profit or with malicious purpose, sent here for disposal, and which was taken to the very worst breeding place of disease and infamy in the city—the locality known as Liberty Hall in Maunakea street. From the first case that appeared there it spread and slew its victims with a rapidity that startled every one, and for a time threatened the existence of the native population, who at that time had not been generally vaccinated, although this was being done, the authorities having received warning a few months previous, by the arrival of a single case of the same disease, which had been promptly quarantined and cured.

The one most important lesson to be impressed on the people by the present epidemic is the importance of having pure water and wholesome food. The introduction of the artesian pumps for supplying the city with pure drinking water was most opportunely carried into effect so as to be available in the present crisis. Without it the epidemic might have had as complete sway as did the small-pox in 1853.

The prompt removal of that old pestivorous abomination the fish market has also had a signal effect in checking the present plague. Thousands of deaths during the past ten years have no doubt had their origin in the stale and poisonous food sold under its roof. If the new market building is fitted with suitable accommodations, and daily inspected by some official whose duty it is to preserve cleanliness, with fresh meats and fish, the epidemic will not pass by without leaving at least one blessing for which all should be thankful.

Complaint has been made by a few because of the temporary closing of the churches and schools. Such regulations have been enforced in other cities in seasons of plague and epidemic, solely to check their spread, and save the lives of some who might be contaminated in such gatherings. The Almighty Ruler of Nations, who permits the prevalence of deadly epidemics, will surely not be offended, if the praises and prayers of his people in times of such affliction are rendered in the family circle or home instead of the temples dedicated to His name and glory. The re-opening of the doors of his houses of worship, when the rainbow re-appears in the sky, will draw together a more devout and thankful people, to join in praise and to appreciate the blessings of which they have been temporarily deprived.

We trust that the dark clouds which have been hanging over us for a month past, bringing sorrow to many, and creating fears, distrust and loss in business, will soon pass away, to be followed by bright and cheerful days. If so, we may all be thankful that the President and members of the Board of Health have had the nerve to adopt a course that has accomplished such a result, even though it may not have squared with some people's notions of what should or should not have been done. Remember the eight months quarantine in 1881.

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A DISINFECTING HULK.

About a year ago, Dr. F. R. Day, on his return from New York, laid before the Board of Health the details of a plan to provide a fumigating vessel, to be held in readiness for

emigrant ships arriving from an infected port, with epidemic on board. It was similar to what is now provided in some large ports to meet any such emergency. The plan appeared to be a most admirable one, as the passengers and cargo can be at once transferred from the vessel arriving and placed in quarantine, permitting the steamer to leave port, without communicating with the shore at all. The expense attending its first establishment and maintenance is quite heavy, and on this account chiefly the proposition was not acted on. Had it been adopted, and such a hulk been fitted up with the necessary appliances, it would seem to have met our present situation exactly, provided that the knowledge or even a suspicion of the deaths on the *Belgic* having been from cholera, had been communicated to the health officer. The outlay would probably not have been greater than will be the cost attending the present epidemic, and then it would be a permanent provision for any emergency hereafter.

Again, it would have met the case of the *Rio Janeiro* bringing freight from an infected port, all of which might have been transferred to such a hulk, allowing the steamer to go on her way, with very little detention.

Situated as we are, midway between America, Asia and Australasia, with steamers calling every week, it will soon become a necessity to make some adequate provision for emergencies of the kind in which we are now involved.

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INTERNAL COMMERCE OF THE UNITED STATES.

At the formal dedication of the Detroit Chamber of Commerce, on Thursday, May 2, the Hon. Chauncey M. Depew, L.L.D., made one of those stirring, patriotic and thoroughly American speeches, bristling with facts, for which he is famous. Alluding to the commerce of the United States, Mr. Depew said:

"The United States is more prosperous than any other nation; its people are better off than the people of any other country, as evidenced by the amount of the tonnage carried in its borders—in its internal commerce—and that internal commerce is possible in its magnitude and in its beneficence,

because the people of the United States are one people of one country and one Union. The whole of the tonnage on the oceans of the world last year was about 140,000,000 tons, while the tonnage of the railways of the world, carried 100 miles, was about 1,400,000,000 tons. There are 400,000 miles of railroads in the world, of which 180,000 are in the United States. Of the 1,400,000,000 tons carried 100 miles last year on the railways of the world, 800,000,000 tons were carried on the railways of the United States. You take the 600,000,000 tons carried 100 miles on the railways of the world outside of the United States, and then you add to it 140,000,000 carried on the ocean in the commerce of the world upon the seas, and we still have in the 800,000,000 tons carried on the railways of the United States 60,000,000 tons more than on all the railways of the world outside of the United States and in all the ocean commerce of the world put together. This traffic is carried by the American railways at an average of 8 mills per ton per mile, while the railroads of Great Britain charge 2 cents and 8 mills, France 2 cents and 2 mills, the Government-owned roads of Germany 2 cents and 6 mills, of Italy 2 cents and 5 mills, and Russia 2 cents and 4 mills.

“This internal commerce of the United States makes our country the most wonderful market this globe has ever known. Our internal commerce is so vast and so beneficent that the sum of the traffic of Rome when she commanded the world, of Genoa when she was queen of the Mediterranean, and of Venice when she commanded the seas, is, compared to it, but as a rivulet to the Father of Waters. This internal commerce is the breath of our National life. With it in prosperous condition we can successfully compete in the markets of the world. We have advanced the boundaries fixed for us by Washington in his farewell address, and have become a factor in the affairs of nations. Our White Fleet, carrying the flag into every sea and protecting the honor of the Nation and the safety of citizens in every port, and the American Line of steamers, making it possible for the American citizen to go to and fro between the United States and Europe under his own flag, are the illustrations of our changed conditions.”—*American Grocer*.

LABOR AND CO-OPERATION IN HAWAII.

*REPORT OF THE HAWAIIAN GOVERNMENT LABOR COMMISSION ON CO-OPERATION AND PROFIT-SHARING.—Concluded.**(From the Manager of the Wailuku Sugar Company.)*

OFFICE OF THE WAILUKU PLANTATION.

HAWAIIAN ISLANDS, December 8th, 1894.

C. T. RODGERS, ESQ., *Secretary Labor Commission.*

DEAR SIR:—Your favor of the 4th inst., with enclosures duly to hand, and have my attention.

Memorandum No. 4.—We do not manufacture sugar for outside growers.

Memorandum No. 5.—Co-operative production, or profit-sharing, has not been tried on this estate. For many years there were planters at Wailuku who raised cane for the mill, and the mill received a proportion for manufacturing same into sugar. It was found not to work well on account of water disputes, poor cultivation and inability of the planters to keep the mill fully supplied with cane, and resulted in the mill owners buying out the planters.

A co-operative system would not be practicable at Wailuku on account of our water system. After eight years experience with planters on Hawaii, I am decidedly of the opinion that on most of the estates a co-operative action between proprietor and laborer in the production of sugar will not prove a success. Such a system would result (if generally adopted) in a great falling off in the output of sugar of the Islands.

In my opinion the laborer would not take the care of his small holding as he would when working under an intelligent management, and poor cultivation means a decrease in yields.

You will find, I am safe to say, that on every estate on the Islands that formerly had planters, that when the cultivation came under one (good) management, the yields were increased.

Yours truly,

C. B. WELLS,

Manager Wailuku Sugar Company.

CO-OPERATIVE CANE PLANTING IN LOUISIANA.

(Extract from a paper read before the Louisiana State Agricultural Society by Judge Rost, relating to Central Sugar Factories in the West India Islands.)

CENTRAL SUGAR FACTORIES.

“In the West India Islands, where cane is cultivated, the system of central factories prevail. Stock companies with large capital have been formed for the purpose of sugar manufacture, and they have put up factories with complete plants and most improved machinery. Sugar cane is bought by the ton as raw material; the cane grower receives in payment either a money price or so many pounds of sugar for each ton of cane. The factory people have nothing to do with cultivation; they merely manufacture whatever cane is furnished to them, and give their whole attention to the full extraction of the available sugar in the cane. The same system prevails in the beet sugar countries of Europe. The beet growers have no other care than to make as good beets as possible, and sell their crop by weight to the factory.

“The idea of a central sugar factory means that the manufacturing and agricultural department will be separated. It goes without saying that the separation of these departments will benefit the planters and the country. Agriculture as improved and developed requires all the skill and attention that one man can give it, and especially is this true in the growing of cane. Of the manufacture of sugar, itself a well developed but still developing science, the same may be said. It is an occupation making full demands upon the time and attention of any one man. The amount of mechanical, chemical and practical knowledge required to carry on a successful sugar house is quite absorbing and exclusive enough to exhaust the energy and capacity of any individual to the exclusion of all else.”

The following are some of the objections made to such changes in a report before the Louisiana Sugar Planters' Association, 1888.

*1. What guarantee that the sugar house owner will continue to give the planter fair prices for his cane?

2. What guarantee that the facilities of the sugar house will be up to the standard of capacity or efficiency?

3. Who will guarantee to the builder of the sugar house that cane will be furnished in paying quantities?

The scheme was considered as impracticable.

ANOTHER CO-OPERATIVE SYSTEM.

(Referred to in April Number of Planters' Monthly, Vol. 12, Page 150, entitled "Labor on Hawaiian Plantations," 1893.)

"There is another system of service now being tried on several estates which promises to work well, being based on the co-operative plan. A planter takes a tract of, say one hundred acres, more or less, and engages to plow, plant, cultivate and harvest for one-fifth of the sugar manufactured from it, less certain small charges. He is furnished by the plantation at cost, with all the necessary tools, and agrees to provide all the labor that is required to work the tract assigned to him in the best manner possible. For each laborer in his employ, while the crop is growing, he receives from the plantation, say, ten dollars a month on account.

*This same point was made by the Commission in their report; see page 13. Although the plantation may be doing much better under the purchase system than by the direct payment of wages, the fact, that the laborer, under the stimulus of being paid according to what he actually produces works harder, uses better judgment, and so increases the product and his own earnings, will be a constant temptation to cut down the price paid for cane to a point where there will be no inducement to the laborer to continue the arrangement.

This would be very poor policy on the part of the plantation management, but experience has shown that even those who are considered pretty good business men will sometimes be selfish and short-sighted enough to do just such things, seeming to feel somehow that an arrangement under which the other party to a mutual agreement is making an increased profit must in some way be detrimental to their own interests.

Any attempt on the part of the plantation to obtain the increased efficiency of the purchase system without giving the laborer a chance to make any corresponding addition to his own earnings, in other words, without fairly dividing with him the results of the increased product due to his harder work and more thoughtful supervision, will be sure to end in failure.

When the cane is ground, and the sugar delivered in Honolulu, he is credited with one-fifth, or whatever proportion may have been agreed on, of the sugar produced from his tract, which sum is equitably divided among all who have shared in the cultivation of the cane. This plan has been tried on several estates, and has worked well for all, though experience will doubtless show how it may be improved for the benefit of all interested. It is a system that can be readily adopted on any or all the plantations."

THE HAWAIIAN LABOR QUESTION.

(Extract from an Article on this Subject published in the Planters' Monthly, June, 1893, Pages 244-245.)

"It is claimed by a few that annexation to the United States would destroy our sugar industry by depriving it of the cheap Asiatic bonded labor system which we now possess. But some will ask, if Louisiana, Texas and Florida can grow cane and make sugar with free labor, why may not Hawaii? American sugar planters possess a broader field for obtaining their free laborers, which no doubt is an advantage over what Hawaii possesses. Still we have some resources, though on a more limited scale. There are in this country not less than forty or fifty thousand men and women of the laboring class, including Hawaiians, many of whom are available for plantation work, if paid sufficiently. It is then simply a question of wages, which here as everywhere else, are regulated by the demand and supply.

"In the event of union on any terms with the United States Hawaiian planters would of course be allowed to engage laborers in any part of the republic, on the same terms as Louisiana planters, but the long distance and consequent expense would be an onerous tax that might amount to prohibition. Still some laborers could be procured from this source. It has been suggested that as the Geary act compels the deportation of Chinese, some provision might be made by which a few Chinese, who prefer to engage as laborers on plantations in Hawaii, might have the option of coming here under contract instead of returning to China,

provided that all who shall come shall be held to the engagement that they can remain here only as long as they continue in service, and when that ceases, they shall return to China, in conformity to our present law, and under such additional restrictions as may be established at the time they enter service. In no case should Chinese laborers be permitted to go from Hawaii to America."

CO-OPERATIVE PRODUCTION OR PROFIT SHARING IN THE PHILLIPINES.—The following from the United States Consular report of the Phillipine Islands, 1890, on sugar farming in that country on shares, has little direct bearing upon our own conditions at the present time, but is interesting as giving one of various ways in which the growing of sugar cane has been carried on without the system of direct wage paying.

Aparceria, or partnership, is the name given to the arrangement between the owner of the land and his tenant, who undertakes to cultivate the sugar cane on shares. There is probably not a single plantation on the Island of Luzon where the laborer is hired by the day, week or month. The conditions of the partnership vary according to the situation of the land to be tilled and established custom. If it is near a town, the laborer receives a smaller proportion of the produce than when it is near a jungle; for when it is in the latter situation, if he is not satisfied with the terms offered, he can clear a piece of land for himself and cultivate it on his own account.

Usually, in the province of Pampanga, the land-owner provides the land, cleared and ready for the plow, the cane points for the first planting, sugar mill, boiling pans and boiling house, money for the support of the laborer until the cane is harvested, and for taking off the crops, and carts to carry the cane to the mill. The tenant furnishes his labor and that of his family to plow, plant and cultivate the cane and to fence the cane fields, the plows and other implements, and cattle for service on the plantation and to run the sugar house if it is made for cattle power.

Under these conditions the sugar is equally divided between the land-owner and the tenant, but the increase in the

yield of the sugar resulting from the addition of the previous years' molasses is considered to belong solely to the land-owner. This increase is at least one *pilon* in every eight, or about twelve and one-half per cent, and is sometimes said to reach one in five, or about twenty per cent of the crop. The facility with which a land-owner is able to mystify his tenant under this custom is said to be one of the reasons why it is clung to so tenaciously. It is generally considered an absurd practice, and certainly depreciates the quality and reputation of the Pampanga sugars. The money advanced to the laborer for his support until the harvest is usually charged with interest at the rate of twenty per cent per annum.

The cost of harvesting the crop for each lot of nine *pilons* in a cattle mill and ten in a steam mill is:

Two cutters, at twenty-five cents per day each.....	\$0 50
One cart driver, at twenty-five cents per day.....	25
Two mill men, at twenty-five cents per day.....	50
One cook and assistant.....	75
One man to carry away the crushed cane.....	25
Total.....	\$2 25

Or the cost may be estimated at twenty-five cents per *pilon*.

The land-owner pays for the work and the tenant gives three meals a day and cigars *ad libitum* to the workmen. The *pilon* is a cone of dirty brown sugar about two feet high and fifteen inches at base. This is cut into pieces and classified according to its color and quality; then broken up and dried in the sun and afterward mixed in various proportions in order to obtain both uniform quality and color before packing for shipment. They cost twelve and one-half cents each, and the expense is borne equally by land-owner and tenant. In making up the account the land-owner charges six per cent interest per annum on the value of the land, the mill, sugar pans, etc., and the cook or boiler gets twenty-five cents for each additional *pilon* of sugar that results from the mixture of the molasses of last year with the new crop. The owner usually borrows money from the owner of the *fuderia* on account of his crop, at a high rate of interest, and the tenant is always in debt to the land-owner, thus forming a chain

of debtors from the laborer to the *faderia*, and sometimes from these to the exporters.

OBJECTIONS TO THE PURCHASE SYSTEM.—The following forcible and able statement of the objections to the purchase system carried on at Ewa and elsewhere, as a means of solving permanently or satisfactorily the labor problem as it presents itself to this country, is from a paper read before the Honolulu Social Science Association by Rev. W. B. Oleson. The views advanced are probably more radical than would find acceptance with a majority of the plantation-owners at the present time, but they are the result of careful consideration, are well presented, and are worth the attention of all who look beyond immediate profit, and are interested in the future well-being of our island commonwealth.

“There are some objections which seem inevitable with all schemes which seek to hold on to the plantation system as a basis. They are, briefly (1), that the supervision of the manager is too arbitrary; (2) that the liability to friction and abandonment of contract is not sufficiently reduced; (3) that the disposal of his labor is not sufficiently optional with the laborer; (4) that there seems lacking any suitable inducement to a permanent alliance of the laborer with the interests of the plantation.

“The permanent prosperity of the sugar interests in these Islands demands: (1) That the planters of cane shall be small landholders who are established in homes of their own on land owned by themselves in reasonable proximity to mills; (2) that the compensation paid these small landholders shall be equitable and assured for a term of years, and definitely adjusted to the current market price of sugar. These two elements are essential, inasmuch as without equitable compensation and the possession of homesteads no permanently desirable class of laborers will become identified with the cane industry.

“The plan which we merely wish to outline, with the hope that it may at least prove suggestive to those most nearly concerned, may be conveniently called the leasehold system. It aims at a complete reorganization of the large sugar estates into leaseholds of from five to twenty or thirty acres,

each according to locality. These leaseholds are to be taken up by responsible laborers who wish to make a home for themselves, and are ready to make the getting of such a home dependent on their industry, frugality and enterprise. Such leaseholds could be leased for a term of five years, with proper conditions that would secure the interests of the company owning the mill, and not operate against the interests of the industrious planter. These leases should be renewable for a second term of five years, conditional, of course, upon mutual satisfaction of interested parties. At the expiration of this renewed lease, the planter becoming attached to the land, and the mill-owner recognizing the reliability of the tenant, the land, if owned by the company, should be deeded over to the tenant, or, if on a long lease, could be released for the full term.

“This leasehold system of cane-growing is more desirable for the country at large, inasmuch as it would offer attractions to the elements in our population which it is most desirable to retain among us. The family is the unit of genuine industrial welfare, for it provides the elements of permanence and of recuperation and of vital self-interest. The low class labor that contentedly exists in plantation barracks and never make homes would be stranded, and that, too, greatly to the financial advantage of our plantation interests, if proper inducements should be offered, and proper protection be guaranteed to the laborers who want to make homes for themselves on land that they have a reasonable chance to acquire and hold in their own right.

“That the leasehold system will prove attractive to the most intelligent labor in our population there can be but little doubt. Men with European blood in their veins have always and everywhere been willing to toil hard and long to win homes and provision for old age. The labor that is done by farmers in America and Europe is more exacting, and calls for greater privations, and yields slighter returns, and is performed under more disadvantageous climatic conditions than is the case with cane-growers in this country. Then, too, the semi-tropical conditions existing here take out of the problem the necessity for a winter season, with its additional expense and discomfort and lack of income. Then, again,

the actual returns in hard money will prove an inducement for the settlement on the sugar lands of a desirable class of tenants.

“The great diversity in the tenure of land now used by plantations, it may be objected, would render such a scheme as has been proposed too complex and unmanageable. Where the land is owned by the plantation nothing could be more simple than the plan proposed. Where the land is Crown land, as has already been suggested, legislative action could undoubtedly be relied on whereby the Government would be as generous toward worthy tenants as the plantations could afford to be. Where the land is leased from individuals, an agreement to release the land to tenants under a similar agreement, whenever such lease should require renewal by the original lessee, would amply secure the interests of the small farmer. The planter and the mill-owner would alike have a vital interest in perpetuating the hold on the land, and what the mill-owner would be impelled to do for his own interest, with reference to land whose lease had expired, would be just as truly for the interest of every tenant on the land.

“But can the plantation-owners afford to relinquish their ownership in land of such apparent value? They certainly can if the proposed scheme is likely to prove permanently advantageous to themselves. If, by this scheme, more cane can be raised per acre, at a cost less than the present farming expense per ton, with a very large shrinkage in the present outlay for superintendence, and with a thrifty and permanent community of small farmers supplying the mills steadily and satisfactorily with cane—the relinquishment of ownership in the land would be equivalent to its sale for a fair figure to the class to whom the mill-owners must mainly look for profitable production in the years ahead.”

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COST OF SUGAR IN NEW SOUTH WALES.

Mr. Edw. W. Knox, general manager of the Colonial Sugar Refining Company, writes as follows to the *Clarence and Richmond River Examiner*:—

Mr. Editor:—Your issue of the 18th instant contains some

extracts from articles that have recently appeared in the *Sydney Daily Telegraph*, about the cost of producing sugar in New South Wales, and the division of the protection on such sugar between the grower and manufacturer. And, as some of your readers may give more credence to such statements than they deserve, I ask your permission to point out how widely the writer of the articles departs from the facts of the case.

He commences his calculations by giving figures as to the price of the cane, and says that in addition to the sum paid by us for cane cartage, the cutting and punting costs 2s 6d to 3s per ton, thus making the entire cost 15s to 15s 6d at the mill. The fact is, as explained some weeks ago in the *Daily Telegraph*, that the cane delivered at the carrier represents an outlay of 17s 6d to 18s a ton, except on the Tweed, where we pay 6d a ton less.

The next assumption is that the yield is 1 ton of sugar to 10 tons of cane; but so long as the "gumming" disease affects the crops as it has done for the past two years, such a return cannot be obtained.

Then as to the expenses of manufacture. The writer of the article suggests that these are the same per ton of sugar produced as in Queensland mills, though, if it be the case, as is asserted, that he has experience in the manufacture of sugar, he must know that such expenses should be calculated per ton of cane crushed, not per ton of sugar produced (for the cost of working the cane is the same whatever its yield of sugar), and that in consequence, the expenses of manufacture are at least 25 per cent. higher per ton of sugar in New South Wales than at Mackay. On this point there can be no dispute, but if proof were wanted we can show that at the Homebush mill at Mackay the cost of the sugar made in 1894 was less by £5 5s a ton, than of that made in New South Wales in the same year; in other words, it stood—when landed in Sydney after payment of the duty—at the same price as that produced here, on which no duty was paid. And in regard to the value of the sugar, there is the same disregard of truth. The selling price is taken as £18 5s a ton, which is £4 15s above the actual value; a large portion of the Queensland crop of 1895 having been bought by us at

£8 10s a ton at the mill, to which has to be added the £5 duty payable here.

Having thus shown that as far as the three points are concerned—the cost of cane, the expenses of manufacture, and the value of the sugar—the statements made in these articles are absolutely untrue, I have only to add a few words about the proposal for the establishment of central mills with the aid of a Government guarantee. It is assumed that we are opposed to such a scheme, but this is not the case. The system is not devoid of advantage to farmers who cannot sell their cane to mill-owners, and are unable otherwise to provide means for working up their crops; but even in Queensland the aid of the Government cannot be obtained without a first mortgage being given by the farmers over their land for the advances required. So long as the production of sugar can be carried on at a profit, no trouble need be expected, but in the event of the mill being closed, and being unsaleable for the sum advanced by the Government, it would probably be found that the mortgage was not a dead letter; and as to the extent of the security that would have to be given, some idea may be obtained from the statement that, on the Clarence, Richmond and Tweed, the farmers would have to pledge an area about twice that now under cane to secure the erection and equipment of factories such as we have placed on these rivers, for dealing with the crops which we have contracted to purchase.

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FAULTS OF THE PLOW.

In a recent editorial we quoted the following remark made by one thoroughly familiar with the subject: "It is strange, in view of the antiquity, and of the importance of the plow, that its proper construction has been studied so little by scientific men, or by those who manufacture it, or by those who use it."

In defence of this opinion we will briefly notice the improvements which have been made in the plow since its primitive forms, and will consider its present faults of construction. It is sometimes of service to see clearly improvements which have been made, and betterments which are

still needed, even though no suggestions of ways in which further improvements may be made are offered.

The primitive Egyptian and Assyrian plow consisted of a forked branch of a tree, one arm of which served as a share, loosening the soil, the other as a beam, drawn by human or by animal power. This was the original double mouldboard or lister plow throwing the soil both ways. An improvement was made by so shaping the wooden mouldboard as to form a twisted wedge, which elevated, inverted, and carried the soil to one side only of the plow. A further improvement was made by making the point of the share of iron. Simple as it seems, it was not until April, 1831, that centre draft was given to the plow by Mears, who inclined the beam inward. In 1797, Newbold patented a cast-iron plow, and commenced its manufacture, but abandoned it, for the farmers said the iron plow poisoned the land. The steel and wrought-iron plow was not invented until 1808. In 1788, Thomas Jefferson improved the plow by showing its proper principles of construction, and in 1836 and 1837, Daniel Webster experimented in plow manufacture, and said that none of his successes in public life had given him so much pleasure as seeing the improved plow of his own construction, drawn by six yoke of oxen of his own raising, cut broad and deep furrows through brush and saplings. In 1845, Governor Holbrook invented a method of shaping plow moldboards symmetrically, either convex or concave.

All of the improvements which have been made in the plow, from the earliest agriculture until now, are simply modifications of the original idea; a wedge drawn through the soil, pulverising and displacing it; no better method has been found.

The faults of the plow are serious ones. The bicycle may be credited with having brought ball bearings into general notice and showing the striking decrease of friction when sliding friction is converted into rolling friction. All of the wearing surfaces of the plow are sliding frictional surfaces, and the loss of power occasioned by friction of sticky earth upon the plow of this broad domain of ours is past computation. The plows of the day are rigid and inadjustable in form. In sandy, or in loose and light soils, and in lumpy or

clayey soils, in shallow or in deep plowing, in plowing at slow or at fast speed, no adjustment or change of form can be made to suit the special conditions of the work, yet these different conditions are often found in one plantation and the plow should be capable of being modified to suit these conditions.

If a perpendicular line is drawn from the point of attachment of the harness tug and the hame to the ground, and another line from the same point to the centre of work in the mouldboard of the plow, and a horizontal line connecting the centre of the work with the perpendicular line, then the hypotenuse of the triangle thus formed represents the total tractive effort, the horizontal line, or base of the triangle, represents the usual tractive effect, and the perpendicular line represents the part of the traction which is expended in pulling the horse down upon the ground. In some cases one-third of the tractive effort of the horse is expended in increasing the pressure of the horses' feet upon the ground instead of in advancing the plow.

In a 14in. plow the earth is elevated, say, 14in., carried sideways 14in. and deposited, inverted, in the preceding furrow. It is easy to see that each inch of unnecessary elevation represents a great amount of unnecessary labor during the lifetime of a plow, and that the carrying of all the surface soil sideways to the preceding furrow represents a great aggregate travel of soil—that is, effort in plowing large fields.

The share of the plow, like the fluke of a ship's anchor, is shaped so as to draw down into the soil. The line of traction, from the centre of the mouldboard to the centre of the horse collar, tends to draw the plow out of the ground. The plow advances horizontally as a sort of compromise between these divergent lines, and there clearly results a loss of power occasioned by the line draft being in one plane while the line of traction is in another plane.

When the total weight of all the surface soil which is elevated, and also carried sideways, in plowing all the cultivated area of this country is calculated, it is clearly seen that the agriculturists of the country waste, each year, in incidental, but not in useful work; in excessive sliding fric-

tion; in indirect lines of traction; in unnecessary resistances caused by imperfect forms, and by inadjustability of form of the plow, a greater amount of labor than was wasted by the builder of the great Pyramid in Egypt, or in the building of the Chinese Wall. If all the soil thus removed were transported to the aggregate distance which it is transported and elevated to the aggregate height which it is elevated, in one heap, no one would dare to attempt the removal of the heap with no better implement than the plow.

Although 10,122 patents have been granted on the plow, in this country alone, it still offers a promising field for future inventors. The killing strain on the muscles of horses in starting cars was not fully considered until the electric motor took the place of horses, in street car work; then it was found that it required three times as powerful a motor to start a car as to run it after it was started. The loss of power in vehicles, by sliding friction, was not understood until the bicycle, propelled by human muscle, showed the utility of converting sliding into rolling friction by ball bearings, and the labor wasted in dragging the plow will never, perhaps, be rightly considered unless inventors themselves drag the plow, and inquire into the reasons and causes of the excessive effort required by this ancient and indispensable implement upon which all civilization depends. The horse and the mule can not complain, and so the plow remains the plow, improved in material and in workmanship, but retaining many of the faults of the plow of our remote ancestors.

It would seem that agriculturists have to observe the working of the implements they use, to notice errors of construction, to study the conditions, and should have ability to suggest means of improvement. Singularly, very few cases are known where agriculturists have invented or improved their implements. More singularly, very few radical inventions, or new departures, have been made by men in their own lines of work. The machinist instinctively judges a suggested improvement in mechanics by what he has seen. The lawyer naturally tests innovations by past decisions. The physician unavoidably refers to his reading or practice for approval or condemnation of anything new in his line.

The agriculturist can but seldom divest himself of preconceived notions. Morse, the inventor of the telegraph, was not an electrician; Watts, the inventor of the steam engine, was not a machinist. The list may be extended indefinitely. To make a new departure, a radical invention, seems to require an ingenious man, untrammelled, open to new ideas and approaching a subject from a new side. Ask an agriculturist how a plow may be improved, and instinctively his mind will picture a crooked thing of steel and wood, which is essentially what he has seen. There are few of us who are not mentally hide-bound, fewer still who do not travel in mental ruts. There are very few who do not inherit religions, or absorb politics from newspapers, or form associates or their ideas from those they admire, or their mechanical opinions from what they have seen, or read or heard of.

The inventor who will furnish a superior substitute for the plow will probably not be a plowman. He will almost surely be poor, for rich men cannot invent. When an inventor becomes rich, which happens but rarely, his attempts at further invention are passing queer. He will meet opposition. Others will develop his invention and reap the reward, and long after he is dead, a statue will be raised to his memory, and his name will appear in the list of benefactors of the race, though but few of the millions benefited by his work will know of him or his work, or will care to know.

If the statesmen of the present time, trained as they are in the actual political methods of the times, should imitate Jefferson and Webster, their illustrious predecessors, their names might go down to distant posterity in the list of those benefactors of the world—the “Improvers of the Plow.”—*Louisiana Planter.*

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CULTIVATING BANANAS ON A GIGANTIC SCALE.

Readers of the PLANTERS' MONTHLY, interested in the development of “minor industries” in Hawaii, will be entertained with the perusal of the following sketch of the rise and present condition of the Jamaica banana trade, which was started only fifteen years since, by Captain Baker of Boston, who has been the leading spirit in developing this busi-

ness, which now counts acres, products and profits by the millions. But it will be seen that the Jamaica government wisely assisted in opening new roads, without which the present results could never have been obtained. Twelve to fifteen large steamers are engaged in this trade. There is on Hawaii room for similar development of the banana trade, but not until roads are constructed from the forest belt to the sea. The extract is from a Demarara paper :

"The innumerable neat little cottages and new houses dotted all over the hills, surrounded by small and large tracts of land in bananas, the many wharves and storehouses, new villages and enlarged and busy centres of trade connected by a network of telephone and telegraph wires, even in the remotest parts of the hills, present a more impressive picture of prosperity than either words or statistics can convey. It is not many years ago, even as late as 1880, that little or nothing was known of the interior of the Island, and the few mule tracks that did duty as roads across the country were seldom used by white people except on an occasional journey. The negroes lived in a semi-wild state, often going about in a naked condition and running and hiding at the approach of a white man. But all this is changed now, for with the continued increase of the area under bananas, many new roads and extensive repairs to old ones were demanded and insisted upon; and the local authorities being unable to cope with the urgent needs of the new industry petitioned the Government, which in 1891, assumed the management of over 900 miles of these parochial roads, and at once set about the simultaneous reconstruction of them in each district at a cost varying from £100 to £400 per mile. Good roads without bridges being of little service, the Government had to face an outlay of £150,000 for this purpose, which has been chiefly spent in the parishes of Portland and St. Thomas-in-the-East, in the construction of some fine iron and concrete structures varying in length from 80 to 480 feet over the Rio Grande River. At the same time urgent demands were made throughout the Island for railway extension and £1,200,000 was voted for the purpose of increasing the line one hundred miles, the greater portion of which has been brought into operation. Several narrow

gauge Tramways have also been projected to tap the rich valleys and act as feeders to the main line. In a few instances such lines are actually in operation, whilst Mr. Clarke's Overhead Wire Railroad traversing the Mandeville mountains from Porus to his banana property is worthy of mention. This line was erected by him at a cost of some \$40,000, solely for the transportation of his own fruit direct from the fields into the railway shed at Porus and thus avoid handling and jolting in cartage.

"The Fruit Companies on their part have not been backward, and beyond the use of private telephones connecting their properties; wharves and buying stations, and the construction of Tramways, have built, and are building fast steamships, specially designed and fitted with warming and ventilating apparatus for the safe conveyance of the fruit in all seasons, while Captain Baker, of the Boston Fruit Company, which owns some 35,000 acres of land in Jamaica alone, is constructing a dry dock at Port Antonio, where he already has extensive shops for boat building and ship repairing. He has further been successful in raising some £300,000 in London to further develop his gigantic Banana Industry in all its various branches, while the Jamaica Syndicate with a capital of £50,000 in ten shares of £5000 each, was proposed, formed and £30,000 of its capital subscribed inside of 48 hours, and cabled to London to Messrs. Hawthorne and Sheddon to acquire certain sugar properties then in the market. Among the gentlemen forming this enterprising syndicate, was His Excellency Sir Henry Blake, who took one share.

"Among the individual proprietors of large banana walks, may be mentioned Dr. Pringle, who some four years ago refused £125,000 for his properties, which as sugar estates in cultivation, together with live and dead stock he had acquired for £30,000. Within the last four years he has almost doubled the area under bananas and now loads his own steamers weekly. The extent of the export of bananas from Jamaica at present is on an average between 70,000 and 80,000 bunches a week, and it is not uncommon for 10, 12 and even 14 steamers to clear at a single port in a week during the height of the season between March and June, so that the annual output may be roughly taken at 4,000,000 bunches."

THE USES OF BAMBOO.

THE JAPANESE FIND IN IT A PROVISION FOR ALMOST EVERY
WANT.

Nearly every variety of the bamboo is utilized in the country where it grows for some purpose or another, but the largest species known as the bambusa arundinacea, which is almost the most common, can be applied to so many useful purposes that to refer in detail to a tithe of them would be wearisome.

The stem of this bamboo is surmounted by light, feathery leaves, which give a most beautiful effect to the groves wherein it is cultivated. It grows very rapidly, sometimes at the rate of a couple of feet a day. It was this peculiarity, in conjunction with its strength, that enabled the old Ceylon chiefs to use it as the means of torturing and executing their prisoners. Binding the unfortunate men to the growing shoots, in a few hours' time the pipe-like stems had either pierced their bodies or rent them asunder.

The bamboo can only perhaps be seen in perfection in South America, India and the tropical islands of the world; but the ingenuity and love of beauty which characterize the Japanese enable them to convert it to a far greater number of serviceable and ornamental purposes than can the untutored natives of the other countries wherein it grows. In all the cities, towns and villages of Japan there are numerous shops, in certain places whole streets of them, wherein bamboos, in some form or other, are exposed for sale. And the discovery of new methods of using them not hitherto seen will be a daily occurrence during a traveler's sojourn among these ingenious people.

Matting, furniture, screens, blinds, baskets, washing basins, baths, buckets, ladders, brooms, stools, trays, cooking utensils and other domestic articles are all easily made from some part or another of these extraordinary grasses. So are pipes, tobacco jars, walking sticks, fans, umbrellas, combs, spoons, flutes and other musical instruments. Then they are by cunning workmen turned into articles of purely ornamental character, such as flower vases beautifully carved,

picture frames, grotesque images, ingeniously opening and closing boxes, frames, trays, plaques and other things that would make far too formidable a list to specially enumerate in any class of literature but an auctioneer's catalogue. In the way of clothing, umbrella hats, which are, probably, for a hot or wet climate, the best form of head covering now used in any part of the world, sandals, clogs and a peculiar form of cloak worn by the peasantry as a protection against rain, are gifts for which the people are indebted to bamboo.

Bamboo harnesses and panniers for horses and oxen are also frequently seen. Piping for drains or conduits, made from the largest-sized stems, is in universal use in the small towns and villages. These pipes are made by fitting selected bamboos together by wedging them firmly one in another until the length required has been reached. The divisions in the stems have, of course, to be first cut out or pierced in such a way that the water can readily flow through them.

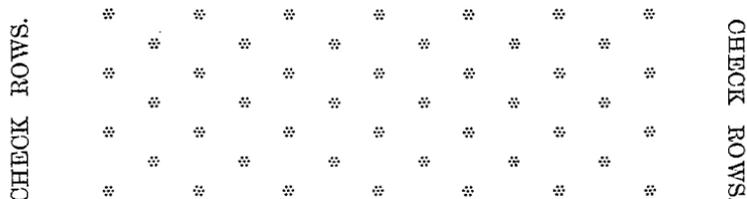
In Japan the greatest danger apprehended comes from earthquakes, which not only destroy buildings, but open up the ground. Earthquakes, however, are such ordinary events that only very violent ones produce any consternation, for the houses, being built in a light way by a free use of bamboo, are not very dangerous, even if shaken down. In remote country districts the people living adjacent to bamboo groves are said to rush there at the first premonitory warning that an earthquake is likely to be more than usually violent, for they have discovered that the tangled network of interwoven roots these grasses shoot out in every direction afford a reliable support, even when the earth splits and yawns beneath.

The bamboo supplies, in its young and succulent shoots, a vegetable which is in universal use, and is frequently to be seen on the menus of hotels and the dinner tables of the foreign residents in the treaty ports. It is often compared to asparagus, but there are few who taste it for the first time, who do not think the comparison libelous. Nevertheless bamboo sprouts are not bad eating, either as a vegetable or in the form of pickles or preserves.—*North Star*.

IMPORTANT TO PLANTERS.

ORCHARDS PLANTED ON THE SEPTUPLE SYSTEM.

The following table will show the advantage of the septuple or check or quincunc over the square system. The minimum distance between the trees is the same, but about 15 per cent. more can be planted :



<i>Feet apart.</i>	<i>Square Plants to an acre.</i>	<i>Septuple Plants to an acre.</i>	<i>Distance in Check Rows.</i>	
8	680	782	6 feet	11 $\frac{1}{2}$ inches.
9	539	619	7 "	9 $\frac{1}{2}$ "
10	435	500	8 "	8 "
11	360	514	9 "	6 $\frac{1}{2}$ "
12	302	347	10 "	4 $\frac{3}{4}$ "
13	257	295	11 "	3 "
14	222	255	12 "	1 $\frac{1}{2}$ "
15	193	222	13 "	0 "
16	170	195	13 "	10 $\frac{3}{8}$ "
17	150	172	14 "	8 $\frac{3}{8}$ "
18	134	154	15 "	7 "
19	120	138	16 "	5 $\frac{3}{8}$ "
20	109	125	17 "	3 $\frac{3}{8}$ "
21	99	114	18 "	2 $\frac{1}{8}$ "
22	90	103	19 "	0 $\frac{3}{8}$ "
23	82	94	19 "	.11 "
24	75	86	20 "	9 $\frac{3}{8}$ "
25	70	80	21 "	7 $\frac{3}{8}$ "
26	64	73	22 "	6 $\frac{3}{8}$ "
27	59	68	23 "	4 $\frac{3}{8}$ "
28	55	63	24 "	3 "
29	52	60	25 "	1 $\frac{3}{8}$ "
30	48	55	26 "	11 $\frac{3}{4}$ "

Trees grow much better when sheltered—a single tree will not grow nearly so fast as if planted in a clump or belts.

This was well illustrated in the olive plantation at the Dookie Agricultural College farm, Victoria, where single trees

did not make half the growth that those did which were planted in clumps, as the one sheltered the other.

Never plant badly formed or unhealthy looking trees, such trees are dear at a gift.—*Australian Agriculturist.*

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FLOWER-FARMING IN AUSTRALIA.

[BY W. LODIAN, MELBOURNE.]

The present paper is intended only as an introduction to the subject—to afford a brief view of the art of perfumery-making. It would be impossible to do otherwise in a short 'complete' article like this. Scent-making already has a big standard literature and all who wish for more information, will get a surfeit of it in any public Library.

Our own people require such information on this subject. Why should we not produce our own perfumery?

'It is easier to make perfumery than make butter,' has often been written, but this fact is little known. Very trifling capital is required; the seeds or graftings are supplied free to Australian citizens by the Government experiment flower-farm at Dunolly, with printed instructions; and a lot of literature on the subject can be had on application to the Department of Agriculture, Melbourne.

A FEW PERFUMERY 'PAINTERS':

Never grow plots of flowers too close together. Reason: If you group various kinds of seed plants too close to each other—as lavender and penroyal next door—each one will become tainted one with the other, and the virgin aroma of each will be confused, and the distilling will not improve them. An acre of roses or jasmine, for instance, should be separated by, say, an acre of potatoes or cabbages, or whatever you like to grow in the way of edibles.

The plants are all arranged in rows running due North and South, so as to get the greatest and longest benefit from the sunshine. On the influence of the sun, consists, in a large way, the superiority of the soil extracted.

For every perfume, a separate still is not entirely required, as, by a simple dose of sulphuric or oil of vitrol (1 part to 20 of water) the still is properly cleansed. A 20-gallon still

costs £5; one of 50 gallons, £30; and one of 300 gallons, £80. To begin with a flower grower in a small way finds a 20-gallon still ample.

What flowers does it pay best to grow? The answer is: Boronia (the native perfume flower of Australia) tube-rose, jonquil, acacia, rose, jasmine, orange-blossom, lavender and peppermint. All now command a market both at home and abroad.

As you go along, read up all the modern literature concerning perfumery.

HOW THE DISTILLING IS DONE:

The space below the false bottom of the still is occupied by water, and a few pounds of salt or alum is dissolved therein to increase its boiling-point. The tank is now filled with the desired flowers, and the funnel-shaped steam-lid is held in place by being screwed down and the crevice packed around with clay just damp. A quick fire is ignited under the still, causing vapor, which, percolating through the flowers laying in the false bottom, releases the attar; and steam and oil go jointly up the funnel and wind their way through the condensing cork-screw shaped pipe. A stream of cold water running into the tub (or ice could be used) helps to condense the steam and oil, which flows into a glass jug or vase. The oil is seen floating on the top, and is skimmed off by a spatula or black ivory paper knife—or sucked off the water by a pipette (glass pipe)—a crystal tube having a bulb about three inches from one extremity. The distiller places one end in his mouth and, lightly touching the little floating filaments of essential with the other, draws them into the bulb.

If the identical distilled water is employed several times over, it increases the output of oil. The temperature of the steam must not be too great, or the essential oil is liable to be injured. Time: about three hours. The false bottom containing the stewed leaves is hoisted out and the mashed mass is used as a fertilizer.

SOME OF THE ELEMENTS OF SUCCESS:

When laying out a flower farm for the manufacture of perfumery, it must be borne in mind that one important *role* to

financial success is the means to obtain low-priced labor—such as women's and children's help, who can do the work quite as well as the higher-priced male. It would not do at all to pay 5s. to 6s. a day to men to collect roses or jasmine flowers. It is also an error to attempt to cultivate too many species of perfume flowers. Select only those which are peculiarly suited to your earth and position, and adapted to affairs climatological. A well-established truth it is that these conditions enhance considerably the value of the outputs of various flowers.

No: it won't pay in flower-farming to employ the labor of men (except in the more technical features) when boy and girl labor can be utilized and the work done just as well. One of the open secrets of the success of the Southern French is that they have always utilized the labor of the young—and even old women—in picking flowers, because they do it quicker and better and cheaper than men.

Make flower-growing serve your ends by using it as a staff—not as a crutch. Thus—never entirely rely upon it for a living. Run it along with something else. If you have a family of children whose work you can have, you are pretty certain to be successful.

WHAT IT DOES NOT PAY TO CULTIVATE:

The perfume-making business of the present time is not what it was like in times gone by, and this data about it in different encyclopædias is almost quite out-of-date. The progress of the science of chemistry has been so quick in recent years, that many aromas hitherto taken from flowers, are now manufactured from chemical combinations and adulterations, by manufacturing druggists. Examples: the fragrance of the simple violet, and its notable modest odor, is now gotten by chemical process. Attempts have been made to obtain it from the urine of diabetic patients. The flower heliotrope has lost its fame as a commercial perfume plant; chemists have learned how to turn out from other sources an artificial article which is an exact substitute—the product quite surpassing—it is given out (in quality, consistency, and likeability, to the real thing of nature)—the odor forced from the flower itself. Even the household lilac has

not been permitted to retain the exclusive privilege of its aroma-breathing characteristics; for the man of the pestle and mortar obtains its chemicals—chiefly these artificial scents are obtained, synthetically, from vefrica coal-tar. Don't be alarmed by the progress of science. Many secrets there are, which chemists cannot imitate.

PROCESSES OF EXTRACTION.

Besides distilling, there are four methods for extracting scents from flowers. They are: expression, maceration, absorption, and the methyl-chloride process. Expression is only adopted where the substance treated is very liberal in its native or essential oil, such as the peel of the orange or citron. By maceration is meant the placing of the flowers in fat made liquid (just warm); allowed to remain therein about three days (no need to keep it warm) and then warmed sufficiently to allow the fat to drain from the exhausted flowers, and, after squeezing out what fat remains with these, they are thrown on to the fertilizing heap. Fresh flowers are added to the fat (the absorbing qualities of which are well-known) and after 8 or 9 such changes, the fat is found sufficiently perfumed. It is then treated with alcohol, and yields its perfume to that agent, which becomes the perfume article of commerce. The fat, if properly cleaned, can be used over and over again. The heat of maceration, however, is rather injurious to the delicacy of the perfume.

The absorption process (usually known by the French name of *enfleurage*) consists in the flowers being laid on frames of cold fat, which is subsequently treated as in maceration. Cotton rags soaked in olive oil are also used, then the oil squeezed out and treated. The methyl-chloride process is a chemical treatment to be best studied in text books and considered—the distillation process is best—but study all the law before building a still.

ATTAR OF ROSES.

Nature has many flowers. Gold is heavy, but roses are not, yet the essential oil of roses is worth more than gold—weight for weight. Of all botanical growths, the otto (same as attar) of roses finds the readiest market. It is

always in demand. Like the most precious of auriferous metals—too much cannot be obtained. In a fairly prosperous year, 300 pounds weight of roses will yield 1 ounce of attar, or oil, and a lot of fragrant and saleable rose-water. The petals are placed in a still, the vapor volatises the attar, and both steam and oil ascend, wind their way through the spiral condenser, and pass out of the other extremity into the receiving base.

The correct kinds of rose to grow are the centifolia, or chou, rose (rarely seen Antipodes-wards) and the rose of France—also called rose de Grasse after the celebrated flower and perfume-producing region of France—a place twice visited by the present writer, in 1891 and 1892. An acre of land under first-class cultivation will yield at least 1,500 pounds of rose-petals; and this will give 5 ounces of attar, worth from 35s. to 47s. each ounce; and there will also be some 100 gallons of rose-water, valued at 3s. to 4s. per gallon.

The roses are best put into the still while quite fresh and crisp—the gathering taking place in the morning after the dew has disappeared. If it is desired to keep them 24 hours before use, sprinkling them with fine salt, to retain their fragrance.

WHAT THE PERFUME STILL IS LIKE :

This is a very simple arrangement. Any intelligent person—whether a mechanic or not—can construct one with the partial aid of a blacksmith. A roughly-made, plant consists as follows: A metallic tank of about 100 gallons' capacity, the interior fixed with a holed false bottom about 9 inches from the base, and set in brickwork (although this is not absolutely necessary), with a fire-retort under. A funnel about 1 foot diameter, at its greatest extent, with a river to enter and a flange to support it, is fitted like a saucepan-lid over a similar hole in the head of the tank. A pipe of 2 inches diameter, a continuation of the funnel, continues like a spiral worm around the woodwork of a barrel filled with cold water,—the end emanating near the base, like a faucet. Thus the apparatus is complete.

Steaming or distillation of flowers is the method employed in the fabrication of neroli, rose, lavender, etc., oils; also of

various other growths. The work of distilling is quite simple; and never necessitates any great degree of experience—*i. e.*, the fat and the oil methods,—both quite easy to learn.

But the greatest art in perfumery consists in adulteration, the knowledge how to blend cheap with valuable essentials. It requires years of learning and is a professional secret. Like painting, it is not easily learned. But the grower does not need these secrets. Those are for the manufacturing chemist.

SOME RESULTS PER ACRE.

The bitter-orange blossom will yield 80 oz., of essential oil per acre, which at 15s. to £1 per oz., means £60 to £80 per acre. The acre of jasmine will bring in £20 to £30. Roses from £70 to £90 per acre (the attar is exceedingly limited, or probably the sum per acre would be higher). The oz. is worth from £2 to £3, even the prolific oil-producing true lavender, brings 60s. per pound. Peppermint yields up to 30 pounds of oil per acre, which at 30s. per pound, means a return of £45 per acre. And so on with the other essential oils, all of which are most valuable. Compare the figures, ye struggling farmers, with your present low returns for growing corn or market produce. Study the perfume market, form rings for keeping up prices, and place your trust in—roses, the attar of which is never likely to be over-produced.

A FEW FIGURES ABOUT OTHER COUNTRIES:

Last year in France, Grasse districts alone produced 2,000 tons of orange blossoms, 1,500 tons of roses, 220 tons violets (cheap labor and abundance defies chemical competition), 200 tons jasmine, 88 tons tube rose, 38 tons jonquil, 33 tons acacia, 22 tons mignonet. One factory above there, by itself uses 50 tons acacia (buying the flowers from neighboring regions), 70 tons roses, 16 tons jasmine and 10 tons tube-rose. There are 50 distillations in Grasse (a town of 11,000) some employing 200 hands in season.—*Tropical Agriculturist*.

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Alligator pears, from the United States of Colombia, are offered in some of the fancy fruit stores in New York City at thirty cents apiece.

THE GUMMING DISEASE OF CANE.

Planters in New South Wales and Queensland have been troubled with the above disease for the past two or three seasons, and thus far have found no effectual remedy for it. In one of our exchanges we find a letter from Mr. E. W. Knox, manager of the Colonial Sugar Refining Company, giving the experience of a planter in experiments made to ascertain the cause of the disease, and the best way to remedy it. From his letter it is evident that poor seed has been one of the principal causes, as it is in other cane diseases. The lesson to be learned is that only the best fresh seed should be planted and only in good soil, if we expect to get strong healthy cane. We copy the letter referred to :

“Mr. Editor.—Our attention has recently been drawn by a farmer on the Clarence to his experience that cane planted from ratoons is less liable to become diseased than that grown from plant cane, and that the older the cane used for plants, the more likelihood there is of sound stock being planted. This, in a measure, is also the experience of other cane growers on the Clarence. Indeed, it would not be surprising if such were the case. The gumming disease develops mainly in the warmer months of the year, on the cane entering its second year's growth so that, in spite of precautions observed when using young plant cane for plants, unsound stock may actually have been planted. Thus it would appear that the risk of planting gummed stock is smaller with two year old than with one year old, and thus in this respect first ratoons are better than plant cane, and second ratoons better than first ratoons, always supposing that the stock has not so far shown signs of disease; in short, the longer the test a stock of cane has gone through, the more certain is its ability to resist disease.

As this seems somewhat confirmed by the results of examinations lately made on the part of our officers, I have no hesitation in recommending our contractors to pay attention to this matter in the coming planting season. It must, of course, be understood that we cannot yet say anything positive on the subject, and that, under ordinary circumstances, it may be advisable to select young and vigorous cane for plants. However, where there is risk of gumming, it is not

of so much importance that the young cane should come up quickly, as that the crop, in the later stages of its growth, should not succumb to the disease.

It may be well to give the result of one of the examinations of cane referred to, as throwing some light on the conditions of growth favoring disease. The farmer who informed us of the matter has growing side by side cane planted from plant cane and ratoons. The former was examined on slightly depressed land near the river bank, and the latter on three different parts of the field, on a slight ridge (close to the somewhat depressed land referred to) in a small depression on the other side of the ridge, and on rather low ground at the back of the field. The cane planted from plant cane (taken from slightly depressed land) was found to be decidedly worse, as far as regards gum; while the cane planted from ratoons, both on the slightly depressed land near the river bank, and on the rather low ground at the back of the field, was found distinctly gummed; no trace of gum, however, was detected in the stalks taken from cane planted from ratoons growing on the ridge.

This points to a lesson, besides that conveyed as regards the use of old versus young cane for cuttings, for it is evident that the lowness of the ground—possibly combined with the shallowness of the soil in the depressed places—had made the conditions of growth favorable to the appearance of the disease, no special provision having been made for drainage, as for instance by ridging and water-furrowing.

EDW. W. KNOX,

General Manager C. S. R. Co.

LIBERIAN COFFEE.

In the Bulletin for January, 1894, the subject of Liberian Coffee was brought to the attention of planters, with the result that the applications received, for plants have been larger than the Gardens have been able to deal with, on account of the notice being short; one planter has ordered 40,000 plants. It is expected that all orders can be satisfied in time for the October rains, but applications should be sent in at once, and will be dealt with strictly in rotation. In

consequence of the large number of plants ordered at all one time, the price has been reduced to $\frac{1}{2}d$ each plant, or 4s per 100. The following information about the market value of this kind of coffee in New York was furnished to the Governor by Messrs. Gillespie Bros. & Co. :

"We are in receipt of your letter of the 8th inst., asking for information as to the prospects of Liberian Coffee in this market, and beg to report as follows :

"The article is coming more into use of late, and from what we can gather, supplies which at present come to this market are well competed for. It is a grade of coffee noted for its large bean, which is a very desirable feature for this market. The great and vital objection to its general use, however, is its very strong and rank flavor. This, to anyone of cultivated taste, is most objectionable. The principal consumption here has been in the Southern and Western States, where tastes are less exacting, and it is there used to add to the appearance of unattractive samples, or to strengthen the flavor of others.

"So far, the demand has kept up and been rather in excess of supplies; but whether its use will extend when these become more ample, as they promise to, is a very doubtful question.

"The article arrives here from several quarters, chiefly from Africa and Java. The African is considered the genuine, and is of a less sightly appearance, stronger flavored than that coming from Java, where the soil seems to have especially modified the flavor. In Java it has been grown most successfully on land which had been exhausted by ordinary coffee. Four years ago the crop there was about 500 piculs; this year it is expected to reach 9,000 piculs; and as cultivation is being extended in four years from now it is expected to reach 72,000 piculs.

"The value to-day of ordinary African Liberian coffee is 18 $\frac{1}{2}$ cents to 19 cents per pound, of Java Liberian coffee 20 cents per pound. To-day's value of ordinary Jamaica is 16 $\frac{1}{2}$ cents to 17 cents per pound. We have found it difficult to ascertain the exact receipts in this country, for the reason that supplies come both direct and via London; but brokers who deal in the article estimate last year's receipts at about 10,000 bags.

“ We have no doubt the article can be successfully grown in Jamaica, as it is reported to be a very hardy plant, thriving in low-lying soil; but whether its production on a large scale would prove a commercial success depends entirely on what effect the soil has on it. If it modifies its natural rank flavor, and at the same time the beans are large, well formed, and slightly, no doubt it would meet with favor in this market, but until this has been ascertained we cannot give a positive opinion. We doubt very much if the ordinary rank flavored growth will increase very much in general favor, but until its production is considerably extended, so as to overtake the present demand, it may be considered a staple article.”—*Jamaica Bulletin.*

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SUCCESSFUL TREATMENT OF RHEA FIBER FROM THE FIELD TO THE LOOM.

NEW AND IMPORTANT DISCOVERY.

The memory of even centenarians of this present time cannot recall the early days of the manufacture of cocoanut fiber into coir rope, but for the two, or possibly three, past generations many unsuccessful attempts have been recorded in the endeavor to deal practically and economically in a similar direction with the well-known grass called Rhea. The urgent necessity for finding fresh material to meet the enormously increased demand for ropes and cables, hose and machine bands, whether for use in navigation or in working the innumerable machines which the skill of the inventor in each year of the latter half of the nineteenth century has brought into existence, has stimulated the efforts of hundreds of ingenious men. Munificent rewards have from time to time been offered, notably from the Government of India, for an invention which could successfully meet this great and constantly increasing want, but up to the present year the varied ingenuity of the cleverest inventors of our age has failed again and again.

It has, however, been lately our privilege to follow, through all its different stages, a process which, under the severest tests, appears, beyond all reasonable doubt, to have solved this most important question. Mr. D. Edwards-Radclyffe, a

member of a well-known old English family, has, in conjunction with Mr. Burrows, whose name has been long known in the spinning trade, perfected a series of machines which, by processes of which the secret is naturally strictly preserved, produce what is known as the "Filasse" in a perfection that has never before been reached, first, by the use of a machine which may be called the ungummer, or the separator of the bark from the stick, and next by a process of chemical dressing of the ribbons.

At this stage the filasse, which is intended to be converted into the finer numbers, is further carefully bleached, the preparation of the rougher numbers not requiring that course. In all former processes known, there has been at this point a universal failure to economically bring the filasse when ungummed into a form suitable for spinning. Tearing up and breaking the long tufts of fiber always broke and knotted the material, causing much waste and extra labor, so that an all-round fiber has been handicapped for years by the want of its special and appropriate methods of treatment. But by the processes now under notice the filasse is next passed through an extremely ingenious drawing frame, a patent machine which separates all the fibers and draws them into parallel lengths corresponding to the knots in the stick. This may be said to be the true requirement, as fiber, ungummed or bleached, on whatever principle, thus secures the chance of reaching the yarn or manufactured state at a price 25 per cent cheaper than to-day. For the rougher counts, the whole of the fiber thus obtained is ready for spinning, and, when treated by the patent spinner, produces even yarn of excellent quality, which, for the manufacture of such articles as fishing nets, cannot be surpassed.

For finer counts the filasse, thus separated and drawn, is then transferred to a gin or comber, in which it is softened and combed by an entirely novel patent process, a process which, whilst combing out every impurity, retains the whole of the valuable fiber. This machine has been specially made for combing Rhea, and, being simple in its mechanism, it will immediately recommend itself to people interested in the trade. A saving is thus effected of over 25 per cent in waste, as compared with any combing machinery now in use, an

advantage the importance of which, in its bearing on the future of Rhea, cannot be too highly rated. The product is at this point perfectly ready for spinning by any of the recognized mills.

By the different processes above described Messrs. Edwards-Radclyffe and Burrows undertake to treat the Rhea fiber as it is now imported. They have not, however, stopped here, but are engaged in perfecting a machine which will enable the planter to treat the fibre on the ground as soon as it is gathered, and, under these favourable circumstances to there and then produce the filasse, thus not only effecting an enormous saving in freight, but also sending into the market a material of better quality and higher value at a less cost than is now incurred in the initial separation and chemical dressing of the ribbons.

Such authoritative judges as Sir Henry Blake and Sir Augustus Adderley have expressed their cordial admiration and approval of the processes which are here described, as well as of an equally clever patent now being developed by the same inventors for the treatment of the leaves of various tropical plants, such as the cactus, the pineapple, and the banana. By this machine, even in its present unfinished state, cactus leaf of great size and thickness was in less than a minute reduced to a mass of silky fibre, the ultimate successful preparation of which for spinning will effect an absolute, revolution in this vitally important branch of the commerce of the world.—*European Mail*, Dec. 26.

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PLANTERS' COMMITTEES OF THE LABOR AND SUPPLY CO., 1895.

LABOR.—F. M. Swanzy, P. C. Jones, C. Bolte.

CULTIVATION.—W. W. Goodale, G. N. Wilcox, J. W. Colville.

MACHINERY.—J. A. Scott, G. F. Renton, A. Young.

RECIPROCITY.—W. G. Irwin, H. M. Whitney, W. R. Castle.

TRANSPORTATION.—J. M. Horner, W. Blaisdell, W. H. G. Arhemann.

MANUFACTURE.—A. Moore, C. C. Kennedy, John Hind.

LIVE STOCK.—B. F. Dillingham, W. Y. Horner, A. S. Wilcox.

FORESTRY.—H. P. Baldwin, W. G. Irwin, J. Marsden.

FERTILIZERS.—H. Morrison, Jas. Renton, L. Ahlborn.

TOBACCO.—V. Knudsen, T. S. Kay, E. W. Jordan.

FIBRE PLANTS.—H. M. Whitney, J. Marsden, C. S. Kynnersley.

FRUIT CULTURE.—W. M. Giffard, J. G. Spencer, M. P. Robinson.

STATISTICS.—J. B. Atherton, J. F. Hackfeld, W. M. Giffard.

COFFEE & TEA.—C. M. Cooke, W. W. Hall, E. W. Barnard.