

THE
PLANTERS' MONTHLY.

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OF THE HAWAIIAN ISLANDS.

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Sugar at five and a-half cents steady should make the heart of the planter glad.

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Claus Spreckels intends to live permanently in the East. John D. Spreckels will devote himself entirely to the management of the Pacific Coast business.

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Pahala sugar mill has recently had a triple effect put in. The mill has resumed grinding, and the new machinery works well. The crop for 1888, it is estimated, will be about the same as for 1887.

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The Cinchona Plantation at Kukuihaele, is reported as doing well, and it is proposed to enlarge it. There are some twenty acres planted, the trees are from six to ten feet high, and have a very thrifty appearance. This plantation is located well up in the woods in a large clearing.

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A correspondent in one of our dailies inquires for a remedy against bumble-bee borers, which are so numerous and destructive here. In the PLANTERS' MONTHLY for April, on page 192, is given a simple remedy, which will doubtless, be as effectual here as it has been elsewhere.

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The game law of last session is not looked upon with favor by the landowners outside of Oahu. Attention was called by one gentleman to the fact that, do what he could, shooting all the year round, he could not keep the pheasants down, and they had become a regular nuisance. Not a patch of sweet potatoes could be planted without these birds denuding and

scratching up the tubers. With a close season, he says, the birds will increase so much as to cause real and serious damage. The subject might receive the attention of some member of the House, and an amendment to the law be prepared.

The Ookala Plantation, Hamakua, Hawaii, proposes putting in some new machinery during the present year. The improvements are calculated to add twelve per cent to the product. If an increase in the crop of one-eighth can be effected by the change, it will be money well spent.

Soot is an excellent protection to seedling plants against many kinds of blight and vermin. Those of our planters who are giving attention to their gardens would do well to remember this. Soot, moreover, is a good manure, and spread over grassplots or vegetable-beds gives excellent results.

Our readers will find in this number articles on forestry, diffusion, waste in sugar-house, plantation life in Cuba, ramie in Guatemala, coffee, fiber plants in Florida, stock statistics in the U. S., sugar in Brazil, packing fruit for export,—a variety which should make it acceptable to all engaged in agricultural pursuits.

We have received from Hon. N. J. Coleman, Commissioner of Agriculture at Washington, the Record of Experiments in the manufacture of Sugar conducted by the U. S. Government in Kansas, New Jersey and Louisiana. The report has several plates illustrating the diffusion plant in use at the Fort Scott station, with Dr. Wiley's elaborate statement.

According to Willett & Hamlin's circular, the consumption of sugar in the United States, during 1887, was 1,392,909 tons, which at 2,000 pounds to the ton, is 2,785,818,000 pounds. The population of that country for the same year has been estimated at 57,000,000. This will give an average consumption of about fifty pounds per head. The United States consumes more sugar than any other country.

Invitations have been issued by Col. Spalding to planters and others to visit Kealia, Kauai, and witness the working of his diffusion plant, which is expected to be in operation during this month of May. This being the first experiment of the kind in these Islands, much interest is excited in it, and no doubt the occasion will draw a full representation of those engaged in the sugar industry. In this connection, readers of the MONTHLY will be interested in reading Gov. Warmoth's report of the success he has had with his diffusion plant. By a late

New Orleans paper we learn that he has announced his intention to abandon the mill process entirely and erect a diffusion plant of sufficient capacity to take off all the cane he can grow on his place. This is significant of what we may expect in the future, when a planter who has obtained the highest degree of mill extraction known in Louisiana abandons rollers for the diffusion process.

Up to the latest date, nothing decisive has transpired in Congress relative to the proposed reduction of duties; and owing to strong conflicting interests and for political reasons, it is very questionable whether any changes can be made on the eve of the Presidential election, without affecting the prospects and success of the party under whose auspices they are made. The administration should take no risks that might result in its defeat.

A good deal was said on the subject of bee-culture in the PLANTERS' MONTHLY some time ago. Mr. Doolittle, a recognized exponent of the subject, urges amateurs—who are apt to have more zeal than knowledge—to banish the idea that “bees work for nothing and board themselves.” Profitable apiculture, he declares, “means labor for a man with brains enough to know that he must leave no stone unturned that tends toward success.”

For a pretty and complete mill commend us to Waianae, on Oahu. The buildings, even when the hardest work is going on, are kept scrupulously clean. There is more in this than many managers think. A mill *can* be kept clean if those in charge will only take the trouble; and better work will be done in a tidy place than one which is slovenly. The machinery at Waianae is of the newest pattern, and in good running order. Young's automatic cleaner has been in use for some time, and is a great success.

Recent experiments in planting sugar cane in lower Florida have demonstrated that the climate and soil are well adapted to it, allowing the cane a longer time to grow and mature than in Louisiana, where it has to be cut before the season of frost sets in. We can see no reason why the whole southern portion of Florida should not be devoted to sugar plantations. It is in the same latitude as Cuba, and possesses a climate equally adapted for cane culture. If Cuba, with all her mountain ranges, can turn out 600,000 tons a year, Florida, with her rich, unbroken alluvial plains, ought to be able to produce one million tons, if not the whole supply of sugar at present required by the United States.

There is no doubt that the Mongoose has saved the planters of Hamakua thousands of dollars. In former years it was no uncommon thing to see one fourth, and even half of the cane left on the field, the rats having rendered that portion unfit for grinding, by eating the stalks near the ground, and causing them to rot and die. Now a field is harvested clean and not a stalk of cane is damaged. As a planter told us the other day, "They complain about the Mongoose eating chickens, but the little beggars save me thousands of dollars, and I could well afford to import chickens from the Coast, if I wanted them. Besides it is only a few chickens they eat, I do not believe they destroy as many as the rats used to."

People talk of our forests being destitute of birds. This comes from their not using their eyes and ears. Mr. Wilson, a gentleman connected with several scientific societies in England, has been spending a year among our Islands and has got together a very fine collection of indigenous birds. He has sent home about a hundred and twenty specimens, and has a large number more to forward. On Hawaii he shot a bird of a species not yet named, and the receipt of the specimen in England was hailed with joy by the lovers of ornithology. Mr. Wilson spent over six months on Hawaii, and is now on the Island of Kauai. On his return he will visit Molokai.

PINEAPPLES, MANGOES AND PEARS FOR EXPORT.

Besides bananas, little or no fresh fruits are exported from these Islands. Occasionally a few boxes of pineapples, limes and oranges are shipped to San Francisco; but as a regular branch of business none of our island fruits (except the above) find a market abroad. On page 232 will be found an article devoted to shipment of fruits to England. The suggestions there given for packing different kinds of fruits for export, including pineapples, on page 234, will be found useful when making shipments to San Francisco. In Florida, the raising of pineapples for the Northern markets is becoming an important business, and the cultivation of them for this purpose is carried on systematically. In some instances as many as four and five thousand are raised on an acre, and these being sold in New York at from three to five dollars per dozen, according to size and quality, the business ought to be a very profitable one. The San Francisco market is poorly supplied from Mexico and Central America, and choice pineapples bring readily twenty-five to sixty cents each.

Kona on Hawaii is the home of the pineapple, and in favorable seasons, when rains are abundant on the lowlands, the fruit is plentiful and large. The plant grows wild, and so thickly does it cover the ground in some places, that the leaves

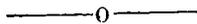
give the land a peculiar reddish tinge. The fruit ripens during the midsummer months—June, July, August and September—and is then very abundant. New and choice varieties have been introduced by Mr. E. Lycan, of this city, called the purple Ripley and sugar-loaf, which in appearance and size excel the native fruit. Of their quality for eating we have had no opportunity to compare. We know of no reason why the cultivation and export of this fruit should not be made profitable, if undertaken by persons qualified for the business. It differs from the banana business in this, that while the latter can be carried on during the entire year, the pineapple supply is limited to two or three months.

Mangoes are another fine fruit which may be exported to San Francisco, provided proper care be taken in packing them. When picked two or three weeks before ripe, carefully sorted as to size, wrapped in papers like oranges, and put up in boxes specially prepared for them, the traffic in this fruit should pay a fair profit. Mangoes abound from April to August, and have become so abundant in some places as to be a nuisance in their season, and trees are frequently cut down for no other reason than a superabundance of fruit.

One of our exchanges, the *Tropical Agriculturist* of Ceylon, referring to mangoes, says: "When pears and apples are being sent to the Colonial Exhibition in London from Australia over 14,000 miles of sea, it is a great pity that no one has thought of making some arrangement to send over to the Exhibition samples of the choicest mangoes of India—fruits which, in the estimation of many, are far superior to the pears and apples of any other part of the world. The mango bears being plucked under-ripe, and by refrigeration, could easily be sent to England *sale quate*, and there ripened to perfection within a week. Nay, more, it could be sent to New York, a sea voyage of only a week longer. The voyage from Melbourne to Colombo takes now about nineteen days, and from Colombo, Ceylon, to London the voyage is longer than from Bombay to London. So that mangoes could be carried from Bombay to New York in a shorter time than apples and pears can be carried from Melbourne to London. Of course at these places an Indian, up in the art of ripening, which is simple enough, might be employed to bring them to maturity after arrival. If England and America were made acquainted with the choice varieties of this unique fruit, there is no knowing what stimulus a trade in mangoes might give. * * * It is stated that "in London there are *restaurants* to-day where over a thousand dinners daily are served, wholly of cereals, vegetables and fruits;" the vegetarian mania is still on the increase. What would not a vegetarian give for a breakfast of iced mangoes and toast? Those who have not tried it had better do so, and see how delicious and satisfactory it is."

The avocado or alligator pear is becoming more abundant here each year, as it grows well in almost every district, though it likes a sheltered place and a rich soil. Where it possesses these requisites it will commence bearing four years from the planting. A few years ago this fruit came only from Hilo, and the larger part of the supplies are still received from there. But it has been found to grow and fruit as well in Honolulu as anywhere on the Islands, and in a few years it is probable it will be as abundant here as at Hilo. Indeed, the largest and finest alligator pears we have ever eaten were raised on the premises of Hon. Judge Preston on King street in this city. The seeds were very small, not larger than a small hen's egg, while the pear measured nine inches in length and twelve inches around. The meat was fully an inch thick and the flavor most delicious. If such fruit as this could be shipped to San Francisco, as it can be and has been, it will always sell, and at prices that will astonish shippers. During the past two years we have known boxes of this fruit being sent to San Francisco by steamer, in the refrigerator apartment, from which it has been usually delivered fresh and in good condition.

Here, then, are three of our tropical fruits—pineapples, mangoes and alligator pears—which may be exported, provided proper care is taken in picking, packing and shipping them, and provided also that arrangements are made to dispose of them promptly on their arrival at San Francisco. The beginning may be small, but it is an industry which will increase from year to year till it equals our banana trade.



The experiment of growing tea is now being practically made at Kukuihaele, Hamakua, Hawaii, where Mr. Purvis has a number of Japanese busy in preparing the ground and taking care of the seedlings. The spot chosen is well up in the woods, about 2,000 feet above the sea level, not very far from the edge of the Waipio valley. The plantation is sheltered from the winds, and the land is said, by the Japanese experts, to be extremely favorable to the growth of the plant. The young seedlings are very healthy but the greatest care is taken of them. They are carefully covered with mats in the afternoon and are uncovered after the chill of the morning has gone off. The experiment is practical, in that the Japanese engaged are working on shares. They thus show that they have faith in the prospect of making the venture pay. The experiment will be watched with interest by all those who desire Hawaii to have a number of strings to her bow. The subject of tea is exercising other minds in Hamakua besides Mr. Purvis', and there is talk of starting a small plantation near Ookala.

A NEW INVENTION.

The future of cane sugar is doubtless guaranteed by the enormous margin between the actual and possible extraction of the sugar from the cane. So long as we lose from 15 per cent to 25 per cent in the extraction and manufacture, cane sugar cannot be said to have come to the end of its rope. As our present sources of profit decrease or disappear, consequent on lower prices or less fertile lands, we must encroach on this margin of waste and convert it more and more into profit. Nor is the general line along which this is to be done difficult to point out. Either by diffusion or by maceration and an abundant use of water, 10 per cent, 15 per cent or 20 per cent more sugar may undoubtedly be secured that is now lost. Theoretically, this is simple enough;—practically, a very serious difficulty arises, viz: that of fuel. And this fuel difficulty we believe is for us in Hawaii the only bar to an unequaled prosperity. Solve for us the question of fuel, and with our present appliances we will extract practically all the sugar at no greater cost than at present, and have the 15 per cent or 20 per cent increase of sugar to add to our dividends or fortify us against disaster.

Accordingly it is a matter of no little interest that Messrs. Rickard & Marsden, of Honokaa, claim to have practically solved this difficulty by an invention as simple as the utilizing of the waste heat from the smokestack. Every mill-man knows that a very large proportion of the effective heat of fuel escapes up the smokestack and is utterly lost. The amount and intensity of this heat depends on the setting of the boilers, draught, etc. Under the best of circumstances on these Islands, the temperature of the escaping gasses is not low, while in many cases it is ruinously high. We believe it is seldom under 400 deg., and very frequently over 600 deg., or even 700 deg., so that under favorable circumstances, such as furnished by triple effects and vacuum pans, it would probably be sufficient to do all ordinary evaporating in a mill. It is this large percentage of waste heat that Messrs. Rickard & Marsden propose to secure by their patented method.

By means of an auxilliary smokestack containing a small steam jet, the heat is drawn from the main stack through the tubes of a single effect cell, where it does ample duty in evaporating the juice contained inside the cell. Of course, as in all experiments of this kind, the patentees have contented themselves with the simplest and most inexpensive plant suitable for the experiment, viz: a small, second-hand, condemned single effect, with iron tubes of small diameter, and have drawn but a portion of the waste heat from one of two smokestacks. Still they affirm that with these imperfect means they can evaporate all the juice from the second mill reduced to a density of 2½ deg. B., and very naturally and reasonably claim that with

proper appliances they will be able to evaporate it at a density of one deg. B. The jet of steam required, to create the draught in the auxilliary stack is described as being utterly insignificant, "about half as large as an ordinary leak in a mill," which may fairly be supposed to be a small amount.

The inventors feel so well satisfied of the success and value of the invention that they propose immediately to secure a large pan or boiler, ten feet long by eight feet diameter, with four-inch copper tubes, properly connected with the boiler flues, and to be used probably, as the first pan of a triple effect, utilizing the vapor of evaporation to work the second pan, and thus requiring none of the ordinary exhaust steam now used for evaporating, but reserving it for the clarifiers and vacuum-pan. By means of proper cleaning facilities, so that the tubes can be blown out with a steam-jet, we have no doubt the heat side can be kept clean, but there may possibly be difficulty about keeping the juice side clean, and this feature of the problem should be kept in mind in making the boiler.

If this invention is as effective as its owners claim, it must prove one of the most important of modern sugar manufacture, and will once more "revolutionize" the business. However we hesitate to be too sanguine; the idea is too simple not to have been tried before. Still we will watch, and report again. L.

In connection with the above, and since we must apply water liberally if we would extract the sugar, and since, at the present, we are hampered for want of fuel, would it not be good economy for us to give the trash a second grinding in a third mill, using water in the third, but none in the second mill? Besides the advantage of a third grinding, there would be the greater advantage of reducing the juice in the last trash to a low density with comparatively little water, and therefore with comparatively little extra evaporation. For example: Suppose with your first mill you are securing an extraction of 60 per cent out of cane containing 85 per cent of juice. There remains then, 25 per cent of juice in the trash. To reduce this juice in the trash to a density of say, five deg. B., you must add an equivalent of water, 25 per cent, which, or such portion as goes into the juice, must be evaporated out. Suppose, however, that instead of applying the water at this stage, you put the trash through the second mill "dry," and extract say, 12½ per cent, you have then remaining in the trash only 12½ per cent, and need to add only an equivalent 12½ per cent of water to reduce to five deg. B., or one-half of what was required in the other case. Besides you get another squeeze. Since the first cost of these mills is the only serious cost, and the returns therefrom would be continuous, we would suggest the question of a third mill as relevant. This is not in the interest of any Iron-Works!

L.

CORRESPONDENCE AND SELECTIONS.

THE FRENCH LAWS AND REGULATIONS REGARDING FORESTS.

[Some ten years ago, Prof. W. D. Alexander visited Europe, and during his stay there investigated the French laws regulating forests, chiefly in regard to their preservation. The opportunities which were offered to him for gathering the desired information were unusually great owing to the Exposition held in Paris in 1878, at the time of his visit, at which the French Government made a fine display of everything pertaining to Forestry. On his return, he made a report to the Hawaiian Government, which was published in the *Pacific Commercial Advertiser*, of April, 1879—which is not only interesting but valuable on account of the facts stated in it. We republish it as the subject of forestry is attracting much attention at the present time, and it is well to know what other countries have done in relation to it.—EDITOR.]

HONOLULU, April 12, 1879.

HIS EX. S. G. WILDER, *Minister of the Interior*:

SIR: I have the honor to submit to you a brief report of facts relating to the French Administration of Forests, collected by me during my late visit to Paris.

In that great and enlightened country forestry has been reduced to a science, so that the Forest School at Nancy contains pupils from every quarter of the globe, and its system of forest legislation, though not suitable in all respects for other countries, yet contains many provisions worthy of our imitation.

The exhibits of the Administration of Forests in the late Exposition at Paris, was one of the most interesting in the whole Exposition.

It occupied an entire building on the east side of the avenue from the Trocadero Palace to the Bridge of Jena, and gave one a fair idea of the subjects taught in the training school at Nancy, and of the works carried on by the Forest Administration.

For example, it contained an extensive set of specimens of different kinds of wood, a very complete Forest Herbarium, a list of trees and description of their adaptations, and a special herbarium of the plants indigenous to the dunes on the coast of the Bay of Biscay. There was also a cabinet of the parasitic

fungi which injure trees. I noted a collection illustrating forest Entomology, comprising all insects useful or hurtful to trees, and specimens of wood and bark showing the kind of injury done to the trees by different insects.

There was a fine set of stuffed specimens of all the animals and birds of the French forests, and extensive geological collections, particularly of fossil fishes and insects from the Lower Alps, as well as minerals and shells from the sand dunes of the coast. Chemistry as applied to forest culture, was illustrated by specimens of soils and ashes of wood and leaves of different species in glass bottles. Mechanical teaching was illustrated by a great variety of tools and of simple manufactures from wood, besides plans of bridges and saw-mills and models of "corduroy" log roads, over which loads are drawn on sledges—"*chemins de schlitte*."

There was a collection of books on forest culture and legislation, and the reports and accounts of the Forest School in manuscript, which were open to public inspection.

To illustrate the work of the Commission there was a magnificent Forest map of France, indicating the woods belonging to the State and those belonging to private individuals, and a special one of the forest of Fontainebleau.

The work of the Forest Administration is naturally divided into two parts.

First—The re-wooding of the Mountains.

Second—The fixation of the Dunes or moving sand-hills of the coast.

These operations were illustrated by magnificent maps and models and by photographs.

For example, there were maps and models of the Torrent du Bourget in Savoy, exhibiting it as it was before and after the work of the Commission. There were models in relief of the Torrent du Laon des Bas in the department of the Haute Garrone, and photographic views of the same, showing how the slopes have been re-wooded, how denudation has been stopped and the destructive effects of the freshets checked. Several other valleys in the Lower Alps were vividly represented in the same way, which gave a better idea of the operations of the Commission than any mere description could do.

In regard to the other branch of its work, the *dunes*, there was a model in relief of the Coubre, on the coast of the Bay of Biscay, and maps of the dunes of the Coubre and Gironde as they were in 1762, in 1862, and again in 1877, showing the great improvements effected by the Commission. There was also exhibited a collection of seeds of the plants used for fixing the sands, and descriptions of the same, as sea pines, furze, "gent," "alfa," "goubet," etc.

In regard to these dunes, allow me to quote a distinguished

French savant, M. Reclus. He says: "These dunes, according to Bremon tier, were advancing at the rate of from twenty-two to twenty-seven yards per annum. Thus we know that the church of Lege was rebuilt in 1480 and in 1650, the first time at two and one-eighth miles and the second time at two miles farther inland. As to the now vanished towns of Lislan, Lelos and many others, their ancient situation is unknown. * * * It is certain, however, that all these dunes were originally covered with forests, from the unanimous testimony of ancient geographers. Unhappily these fine forests were nearly all destroyed during the Dark Ages, either by barbarian invaders or improvident lords or by the peasants themselves. Even in the last century the King of Prussia, Frederick William I., being in want of money, caused the forest of pines to be cut down which extended from Dantzic to Pillau. The operation brought him in 200,000 crowns, but the consequence was that the moving sands invaded the great inland bay, destroyed the fisheries, obstructed the navigable channel, buried the defending fortresses, and changed, in the most vexatious manner the hydrography of all those parts. * * * The great engineer, Bremon tier, applied himself to the task of fixing the dunes of Gascony in 1787. The works were suspended in 1793, but commenced again in the early part of this century and completed some years ago. The dunes of Gascony, fixed for the future, enrich the lands which they formerly threatened to bury, and one must reckon the annual increase of public wealth at hundreds of thousands of francs. At the same time, the sand protected from the sun's rays by the shade of the pines, produces herbs which are utilized as straw or food for cattle. The marshes, which during six months of the year, were transformed by rain-water into impenetrable morasses, have been drained without the intervention of man, by the millions of roots constantly sucking up the moisture from the sands. Thus science has repaired the disorders formerly caused by man's imprudence."

RECLUS ON DENUDATION.

I cannot forbear quoting the same author's graphic description of the *denudation* caused by the destruction of the woods. He says:

"In the mountains of Dauphiny and Provence, the slopes, most of which are now so bare, were once covered with trees and various plants, which kept back the surface water resulting from rain or melting snow, by absorbing a great part of the falling moisture, and thus retaining the coating of earth over the beds of crumbling rock. During the course of centuries the trees have been cut down by greedy speculators and by senseless farmers who wished to add a few strips of land to their fields in the valleys or to their pastures on the summits,

but when they destroyed the forest they destroyed the very land it stood on.

“The rain or snow being now no longer kept back upon the slopes by the roots of the trees, descends rapidly into the valley, driving before it all the debris torn from the side of the mountain. The tooth of the goat and the sheep helps to lay bare the rootlets of the herbaceous plants and the brushwood; bit by bit the whole of the thin coating of earth is removed, the bare rock shows itself, and deep ravines are hollowed out in the cliffs and are traversed in the rainy seasons by furious torrents which once did not exist. The water which once used slowly to penetrate the earth, conveying fertilizing salts to the roots of the trees, now serves no other purpose than that of devastation. * * * In some localities there is not a single green bush for a space of several leagues in extent; the scanty gray-colored pasturage is scarcely visible here and there on the slopes, and ruined houses blend with the crumbling rocks that surround them. The stream in the valley is generally but a scanty rill of water winding among the heaps of stones, but these heaps of shingle and rock have been carried down by the torrent itself in the days of its fury, in many parts of its course the Haute Durance, which is generally not more than thirty feet wide, seems lost in the midst of an immense bed of stones, a mile and a quarter wide from bank to bank. * * * The men have disappeared along with the trees; the axe of the woodman no less than the sword of the conqueror has put an end to or transplanted whole populations. At the present time the valleys of the Southern Alps are becoming more and more deserted, and the date might be approximately estimated at which the Departments of the Upper and Lower Alps will no longer have any home-born inhabitants. During the three centuries that have elapsed between 1471 and 1776, the ‘vigneriers’ of these mountain regions have lost a third, a half, or even as much as three-fourths of their cultivated ground, and the men have disappeared from the impoverished soil in the same proportion. From 1836 to 1866 the Upper and Lower Alps lost 25,000 inhabitants, or a tenth of their population. * * * It is the mountaineers themselves who have made and are seeking to extend this desert which separates the tributary valleys of the Rhone from the populous plains of Piedmont.”

It is this process of destruction that the French Government is endeavoring to arrest by the Commission for re-wooding the mountains.

The following brief sketch of the French Forest Service and Code is based upon a work by Prof. Puton of Nancy:

ORGANIZATION OF FOREST SERVICE.

The administration of the French forests is an auxiliary public service depending on the Minister of Finance.

It is placed under the orders of a Director-General, who is in direct relation with the Minister, and who directs all the operations relating to the service.

The *interior* or *sedentary* service is constituted at Paris by a council of administration formed of two administrators, and by various bureaux of the the central administration; in the Departments by the sedentary *employes* of conservation and inspection. The *exterior* or *active* service is constituted at Paris by the Director-General; in the Departments by the conservators, inspectors and chiefs of cantonment of the administrative management, who are styled "agents," and by brigadiers and guards for surveillance, called "preposes."

The special detached services in this department are the Commission of re-wooding, the service of art, the forest schools and the forest service of Algeria, which is specially organized.

There are three grades—first, the *conservator* at the head of a "conservation," who makes periodical tours, manages the finances of his district, and has a kind of military authority over the "personnel" under his orders.

Next come smaller divisions, called "*inspections*," each administered by a chief of service called an *inspector*; and last, *cantonments*, each under a chief of cantonment, who is either a sub-inspector, or "garde-general," and is the immediate chief of the brigadiers and guards under his surveillance, has direct oversight of the works carried on in the forests, etc.

The brigadiers are chiefs of the guards of their brigade, and intermediary between them and the chief of cantonment.

THE DOMANIAL FORESTS

of France in 1875, contained 2,447,901 acres. This domain produced in 1869 a revenue of 37,545,644 francs, or about seven and a-half millions of dollars. The Algerian forests are administered by forest agents detached and placed under the authority of the Governor-General of the colony. In 1872 the forests belonging to the Government domain in that colony contained 5,151,944 acres, of which about one-half are overgrown with bushes and given up to pasturage.

THE COMMUNAL FORESTS

in 1875, contained 4,725,484 acres, and are steadily decreasing. During the twenty years between 1855 and 1875 the Government authorized the clearing and the alienation of an average of about 2,170 acres per annum. The management of the communal forests forms an auxiliary service of the communes, which is imposed upon them, and which they pay for by means of a special tax. Whenever difference of opinion arises between the forest agents and the commune, the matter is referred to the Council of Prefecture of the department, with the right of appeal to the Council of State.

THE PRIVATE FORESTS

were estimated in 1865 at 15,140,032 acres. From 1828 to 1874 the administration permitted the clearing of 1,083,817 acres of woods, which would be at the average rate of 23,559 acres per annum. This figure, however, is far from indicating the extent of the clearings made, for there is a large number of woods in the plains which can be lawfully cut down without previous declaration; and again, private parties are far from clearing all the wood for which they make the legal declaration.

Private persons have the right to cut down their forests, but this right, which was created in 1791, suspended in 1803, and restored in 1859, must only be exercised under the surveillance of the administration, which is the judge of the cases in which the general interest requires the preservation of the wood. The Minister of Finance pronounces finally upon the right of the proprietor, after receiving reports from the forest agents.

Woods belonging to private individuals are divided into two categories. The first class is entirely free from the surveillance of the administration, and the proprietor is absolutely free to cut them down without any formality. It includes;

1. Young trees planted within twenty years, except when the planting has been ordered by the Minister in consequence of an illegal cutting, or when the planting done in the mountains has been subsidized, or is comprised within a circuit of obligatory re-wooding,

2. The wood of gardens and parks, enclosed or attached to houses.

3. Woods not enclosed, of an extent less than ten hectares (twenty-four and seven-tenths acres), when they do not form part of another wood which would complete a content of ten hectares, and when they are not situated on the summit or slope of a mountain.

All other woods are subject to the surveillance of the administration, which, however, cannot oppose the clearing except for one of the six following reasons, viz:

1. The maintenance of the lands upon the mountains or slopes. 2. The defense of the soil against erosions and invasions of the rivers, brooks or torrents. 3. The existence of sources and streams of water. 4. The protection of the dunes and of the coasts against the erosions of the sea and the invasion of the sands. 5. Public health. 6. The defense of the territory in the parts of the frontier zone, which are determined by a decree of public administration.

The law requires that a proprietor who intends to cut down his wood shall make a formal declaration in duplicate at the sub-prefecture of the arrondissement, stating all that is necessary to be known in regard to the wood. One copy is vided by the sub-prefect and returned to him.

A forest guard notifies the proprietor eight days in advance of the day when the reconnoissance will be made by a forest agent, and afterwards a copy of the report of the reconnoissance is given him, with an invitation to present his observations.

After this the Conservator of Forests can address his protest to the prefect, who notifies the proprietor of the fact and sends all the papers to the Minister of Finance. The Minister decides after taking the advice of the section on finance of the Council of State.

Four months after the visa of the declaration are allowed the Conservator to make opposition, and six months to the Minister to decide upon it.

If the proprietor cuts down his wood without making declaration, or against the decision of the Minister, he is fined according to the extent of the wood, and may be compelled to re-plant it or to pay the expenses of the operation. But if the protest of the Conservator is not made during the delay of four months after the formal declaration is filed at the sub-prefecture by the proprietor, and if the decision of the Minister is not rendered within six months after this protest, then the proprietor is at liberty to cut down his wood. By this system, organized in 1859, the Administration of Forests exercises its action upon fifteen millions of acres of private forests.

RE-WOODING.

Agricultural inquiries have proved the existence of about 6,700,000 acres of uncultivated and unproductive lands belonging to the communes and to the public establishments. Laws were passed in 1860 to encourage, and in certain cases, to compel the re-wooding of these lands.

When the re-wooding is *optional* it is encouraged by bounties; it is *compulsory* for the communes, public establishments, and even private proprietors, within a circuit where this work is considered absolutely indispensable, and the extent of which is fixed by a decree rendered in Council of State, after the accomplishment of certain formalities. The action of these laws extends over about five millions of acres. From 1861 to 1868 the works of obligatory re-wooding affected 52,684 acres, and the works of optional re-wooding extended to 144,270 acres. The Forest Service had created in 1878 more than 475 acres of permanent nurseries, besides a great many temporary ones. They were able to deliver more than seventy millions of plants a year. The Forest Service constructed between 1859 and 1867, 126 saw-mills, 1,213 forest houses, lodging 1,400 guards, and 9,436 miles of roads. I take these statistics from a text-book published at Paris in 1876.

DUNES.

The moving sand-hills along the sea shore, especially on the Bay of Biscay, constitute a grave menace to the inhabitants, whose estates are exposed to be buried by their incessant march.

The fixation of these by plantations of maritime pines and other sand-loving plants, by methods first put in practice by Bremon tier at the beginning of this century, is justly considered a work of national utility and general security.

There are about 195,000 acres of dunes submitted to the administration, of which 150,000 acres were re-wooded in 1868. According to *Lippincott's Gazetteer*, there is a tract covered with sea-pines extending 100 miles by seven.

REGIME OF THE "MAURES" AND OF THE "ESTEREL."

In a region of ancient Provence which contains 275,110 acres of forests belonging as much to the State and to the communes as to private individuals, fires constitute a public danger which the law of July 6, 1870, was intended to avert. The right which proprietors have of lighting fires in their forests and in their "landes," is suspended during certain periods of the year, during which the prefect of the department forbids all fires, by an order issued on the proposal of the Conservator of Forests and by the advice of the Council of Prefecture.

It appears that in the year 1866, France imported wood valued at 180,400,000 francs, and exported to other countries 32,000,000 francs worth.

EXTRACTS FROM THE FOREST CODE.

All forest agents and "preposes" are forbidden to deal in wood in any way, to take any part in selling Government timber, to collect fines or rents due the Government, to serve on juries, to engage in hunting, or even to marry without authorization of the Conservator. They are regularly commissioned and sworn in. Each one has a marked hammer, which is the public mark of his employment. This is registered at the office called "greffe du tribunal," and the falsification of it is visited with heavy penalties.

PROTECTION OF GOVERNMENT FORESTS.

The removal or even extraction of stones, turf and various products other than wood is punished as a "delit," or misdemeanor, though in any land not forest, it could only give rise to a civil action for damages.

Any person passing through the forests outside of the ordinary roads with an axe, or other instruments for cutting wood, without special permission, is liable to be arrested and fined. In the same way vehicles of all kinds, and animals are not tolerated in the forest land, whether wooded or not, except on the ordinary roads. The cutting and removal of trees is forbidden,

distinction being made between those greater and those less than two decimetres (eight inches) in circumference. There are special clauses to protect nurseries by which the cutting or removal of plants is punished by fines ranging from ten to 300 francs, and imprisonment at discretion of the judge.

There are various minute provisions regarding the mutilation of trees, as cutting off the tops, stripping off the bark, cutting off the principal branches, etc.

SALE OF GOVERNMENT TIMBER.

The timber in the public forests is generally sold by order of the Director-General in one of two ways. By the first method, the right is sold to cut the standing wood within certain definite limits, called a "coupe sur pied." The contractor is bound by numerous conditions, some of which will be mentioned below.

By the second method the administration hires wood-cutters to prepare the lumber, which is afterwards sold, either as a whole, or by measure. This is called a "coupe faconnee."

Sales of wood are always made by public auction. Notices must be posted up fifteen days beforehand in the chief place, at the place of sale and in the adjoining communes, a copy of the conditions is deposited with the secretary of the president of the sale, and various other formalities are required by the law. The auction is presided over by the prefect, sub-prefect, or mayor, in presence of a forest agent and of the collectors, "receveurs charges de l'encaissement," who form the "bureau of adjudication." There are two methods used, by the first of which the price at which the wood is offered is gradually lowered until a purchaser pronounces the words, "I take." By the second, very small candles serve to measure the time during which there is an opportunity for a bid ("le temps du concours.")

Whenever standing timber is sold at auction, the boundaries of the cutting are marked by the forest agent, and certain trees are marked by a hammer as reserved. Any infringement on these is heavily fined. All cutting or removal of wood before sunrise or after sunset is absolutely prohibited under a fine of 100 francs. The contractors or purchasers of standing timber are allowed to build huts for their workmen; but only in places assigned in writing by the forest agents. It is the same with the special roads made to carry away the timber. If they are necessary, they are to be constructed only on lines pointed out by the forest agents and mentioned in the contract. The contractor may bring cattle into the clearing to cart off his wood, but it is stipulated in the contract that the animals shall be muzzled with basket-work or iron wire to prevent their browsing, etc.

RIGHTS OF COMMONERS.

The forest laws of France have limited and regulated commonable rights to wood and pasture. Thus, all prescriptive rights to the pasturage of sheep and goats in forests are abolished for the past and prohibited for the future, both in the forests of private persons and in those of the State and communes.

Common rights concerning other animals are subjected to numerous legal restrictions, and particularly to the obligation to obtain a preliminary "delivranc" before exercising the right. This "delivranc" is founded upon the necessity for surveillance upon the use made of his privilege by the commoner, and it is the act by which the proprietor authorizes and regulates it. It consists in the designation of a canton "defensible," that is to say, judged capable of supporting without grave inconvenience, the introduction of cattle, and it specifies the number of cattle and the duration of the pasturage, as well as the roads leading to this canton. In case of dissatisfaction an appeal can be taken to the council of prefecture. For the State and the communes the designation of the pasture is made by the forest agents, and it must be renewed annually, generally by February 1st.

Another restriction is this, that the commoners enjoy this privilege only for animals intended for their own use, and not for those which they raise for sale or export. All animals must be marked and the brand registered. The commoners must also fasten a bell on the neck of every animal admitted to pasturage under penalty of a fine of two francs for each animal. If communes have a common right of pasturage they are obliged to form a common herd and to appoint a common herdsman, who is responsible to the forest agent. Heavy penalties are incurred when cattle are found outside of the prescribed limits or in greater number than that fixed by the declaration. In 1866 there were 295,101 acres subject to common rights of pasture.

COMMON RIGHTS TO WOOD.

Without obtaining a preliminary "delivranc" from the proprietor, the commoner cannot take the wood to which he is entitled. When commoners have a right to a definite cutting they are obliged to present to the administration a responsible contractor, who will perform the cutting, subject to all the rules prescribed to purchasers of timber in the interests of the forests. In regard to the prescriptive right to dead or fallen wood, it is limited by the prohibition of the use of any hook or iron instrument on penalty of a fine of three francs. The commoner has a right to wood only for his necessities and those of his family, and not for sale or export. He cannot help himself

to wood without being authorized to do so by the proprietor of the forest, in the mode technically termed a "delivranc."

FIRES IN THE FOREST.

A conflagration (incendie) intentionally made in the forest of another is a *crime*; an involuntary one is a *delit*, misdemeanor, when it results from carelessness or in any case when the fire is lighted at less than 100 metres from the forest.

Any fire whatever lighted or carried in the interior of any forest, public or private, entails a fine of from twenty to 100 francs. The same applies to a zone of 200 metres width measured around a forest. If the fire spreads, then the offence becomes a *criminal* one and a more serious affair. A proprietor, however, has the right to make fires in his own forest for making charcoal and other purposes. But, as was stated before, in Provence, in the pine woods of the coast, and whenever public safety requires it, the prefects can forbid even private owners from lighting fires in their forests at certain seasons.

ZONE OF 500 METRES.

Within a zone of 500 metres wide around public forests, the construction of isolated dwellings, as well as of any lumber yard or carpenter shop, has been forbidden from and after the year 1827. This does not apply to a village or hamlet.

ZONE OF 1,000 METRES.

Within this distance of the forest, two kinds of establishments are prohibited: *1st*—Lime-kilns, brick-kilns and tile works. *2d*—Houses on poles, huts and sheds, which might become places for receipt of stolen goods.

ZONE OF 2,000 METRES.

Within this last distance, *isolated* saw-mills, worked by steam or water power, are prohibited; but not hand saw-mills. But the prefect has the power, by and with the advice of the forest agents, to authorize the construction of saw-mills on certain conditions and for a cash consideration. Such conditions are the right of visitation, the obligation of declaring to the local guard the situation and number of any wood five days before introducing it into the establishment, etc., the sub-prefects in like manner can license brick-kilns, lime-kilns, etc., within the zone.

This is perhaps, sufficient to indicate the character of the French Forest Code, imbued as it is with the spirit of the Civil Law, and alien to Anglo-Saxon conceptions of private rights.

Believing, however, that it contains some wholesome provisions worthy of our consideration,

I remain your obedient servant,

W. D. ALEXANDER.

GOV. WARMOTH'S VIEWS ON DIFFUSION.

In the *Monthly Record of the Louisiana Planters' Association*, giving the record of the meeting held in February, we find the following report read by Gov. Warmoth:

It would be manifestly improper for me to anticipate the report of Dr. Wiley, the chief chemist of the Department of Agriculture, on the work of diffusion at Magnolia Plantation during the past season. He is now at work preparing it, and hopes to soon have it ready for distribution.

But I can give you some of the already reputed results, and some views of my own based upon them, which may be of service to our industry at this time.

I began by saying that I am satisfied thoroughly that diffusion will work successfully on all conditions of cane. We worked it on green cane, on some fairly ripe and some very ripe and full of sugar, and so far as I could judge it worked as well on the green cane, gave in proportion results as satisfactory, as upon the best cane we had, and as compared with our mill work, showed about the same difference in quantity of sugar, one with the other.

The first cane worked was from second year stubble, and it gave us 146 pounds of first sugar to the ton and forty pounds of seconds.

The molasses was put into the cisterns with the other, and we cannot give any estimate of the thirds. Our mill gave us 145 pounds first and second from this cane.

The next test was upon some green cane, grown on new land, yielding twenty-eight tons of cane per acre; considerably blown down and sprouted in a small degree. This had much less sugar in it than the first cane. Yet we got 128 pounds of first sugar and forty-three pounds second sugar per ton from it.

Our mill gave us 140 pounds of first and second sugar per ton from this cane.

The next run gave us 165.5 pounds of first; 45.9 of second. Total, 211.4 pounds, with thuds in the wagons, which we estimate will give us fifteen pounds more, a total of 226.4 pounds.

The next run was on 450 tons of cane beginning on the 13th of January and ending on the 18th. This cane was rich and fine. It had been killed on the 26th of December, was not windrowed, but was in fine condition. From this cane diffusion gave us 181 pounds of first sugar and grained seconds, with enough left in the wagons to bring it up to 223 pounds. From this cane we got 193 pounds of first and second sugar by our mill.

All of this shows about the same difference between diffusion and our mill work, of about thirty-five pounds of sugar per top of cane.

I do not mean to be invidious when I say that I think we got a little better extraction by our mill than any of our neighbors. My friend, Mr. Dan. Thompson, got more sugar to the ton of cane in 1886 than we did, but this result was obtained not so much by his extraction as by the skillful work in the balance of his house, in which I firmly believe the equal does not exist in Louisiana.

It is safe to say that the average yield per ton of cane in the State is not over 110 pounds. I believe diffusion will bring the average up to within the neighborhood of 200 pounds. A gain of certainly seventy-five pounds and perhaps ninety pounds per ton of cane.

My nearest neighbor, Mr. Bradish Johnson, obtained the past season 136 pounds of sugar per ton of cane. We are within three miles of each other; our land is much the same; our cultivation is substantially the same. It is fair to assume his cane was as rich as mine; yet we had about 175 pounds of sugar per ton, a difference of thirty-nine pounds of sugar per ton on our mill work and about seventy-one pounds difference on the diffusion work. Take his estate for illustration:

His ten thousand tons of cane gave him 139,000 pounds of sugar. Had he worked his crop by diffusion he would certainly have had seventy pounds more sugar to the ton of cane. This would have increased his yield 700,000 pounds of sugar, which at five and a-half cents per pound would have given him \$38,500 more for his crop than he received.

Take my own crop of 13,300 tons of cane. Had I worked it by diffusion I would have had thirty-five pounds more of sugar per ton. This would have given me 465,500 pounds more sugar than I obtained—an aggregate of 2,865,000 pounds of sugar from about 600 acres, or 4,750 pounds per acre. The cash increase of my crop would have been, at five and a-half cents per pound, \$25,592.50, a difference to Mr. Johnson of \$3.85 per ton of cane, and to me on my crop of \$1.82½ per ton of cane.

I am sorry I cannot give you exact data as to the consumption of fuel. Dr. Wiley will do that very nearly in his report, but I venture the opinion that the man who grinds his cane and crystalizes his sugar in the high pressure vacuum pan, and hauls away his bagasse; reduces his syrup in open pans, will find he can get along in diffusion with less coal than he now consumes. I also venture the opinion that even the man with the ordinary bagasse burner consumes as much fuel as would be necessary to make his sugar with diffusion.

I do not regard the fuel question as at all embarrassing, when we consider the enormously increased yield of sugar we are sure to obtain, and the economy we may secure by using modern boilers.

Diffusion has important advantages over milling besides the

increased yield in sugar. The first cost of a good plant cannot be more than the mill; the wear and tear is made lighter; the danger of breakdowns more remote; and if they occur, are simple and easily repaired. Not so with a mill. Almost every accident to the mill is serious, and the whole crop may be imperiled by it. Again, the work when once started is the same every day. You can obtain the same extraction every day during the whole season. You do not have to feel the bagasse every few minutes, as a doctor does the pulse of his sick patient. You are not troubled by too much or too little feed being put on the carrier. You do not swear when your roller is locked on both ends; no groaning of the mill when it refuses to take the cane; no discovery after a few days' work that there is no oil in the hydraulic; or that there is not weight enough on it, or, which is equally serious, that there is too much weight, and that a shell or a shaft is broken.

With diffusion it is the same thing every day. So many cells filled an hour; so many emptied every hour; the water kept so hot, and that is all there is of it. You can actually get all the sugar out of the cane.

The juice is clarified just as you clarify mill juice, and worked just the same in every way.

It is the simplest, easiest and most efficient way to extract the sugar. Of this there can be no possible doubt.

In my opinion it should be worked on a large scale.

In most sugar houses in the State the cost of introducing diffusion with all its adjuncts puts it beyond the means of individual planters to adopt it. It is necessary if you go into diffusion to go at it right. You can't work it unless you have plenty of good water. A triple or quadruple effect is absolutely essential to its success. You want to give your double flue and cylinder boilers away, and put in the best steaming and most approved boilers that can be bought. Your vacuum pan should be of the best pattern, and your stuff cooked at low temperatures, and you should never attempt it without an excellent laboratory and a skillful chemist, who should carefully test the work as it progresses, and save you from loss.

Neighborhoods should combine together and erect a factory large enough to take off the crop in the allotted time. This is easier than most people believe. I have heard a gentleman give as an objection to going into a central factory that he might lose his crop while his neighbor saved his, and ask who would get the crop off first. A central factory ought to have the capacity to work all the cane as fast as delivered. I give as an illustration my own neighborhood.

My mill has a capacity of 275 tons of cane. Woodland has the capacity of 300 tons, and Deer Range about 225 tons per day. My average work the past season, including stops and

delay, was about 200 tons, Woodland 145 and Deer Range 120—a total capacity of 800 tons of cane per day. The three houses actually worked less than 500 tons per day.

One diffusion battery could work the whole of this cane, and the expense of two of the sugar houses could be saved, and the output of sugar nearly doubled.

I will say in conclusion, this: The crop of Louisiana for 1887 is believed to be about 270,000 hogsheads of sugar. I believe if the same cane had been worked by diffusion the crop would have yielded 500,000 hogsheads, and could have been made in central sugar houses at very much less cost. And although the increased yield at Magnolia was only about thirty-five pounds of sugar per ton, I intend, if I can, to beg or borrow enough money to put in a 400 ton diffusion plant with all the most approved adjuncts, and have no doubt that I can pay for the whole plant in two years by the increased yield of sugar I will have over our best mill work.

Gen. Brent asked what his green cane polarized? Reply was 11½ per cent. In response to others, Gov. Warmoth said that they used river water to diffuse the chips, part of the time filtered with a Hyatt filter, but as the chips act as a filter, it seemed to do as well without filtering.

Mr. G. G. Zenor asked cost of the cutters? Reply, "about \$2,500." Mr. Zenor then said he thought if a planter had a good mill he might use it instead of the cutter and diffuse the bagasse. He asked if this had been tried at Magnolia?

Gov. Warmoth replied they did not because of lack of time. There would be no difficulty in diffusing bagasse. However, to run the mill takes twice as much power as to run the cutter.

Mr. Richard McCall suggested that the shredder might take the place of the cutter.

Gov. Warmoth said Mr. Fiske thought the shredder knives might be so arranged as to slice the cane properly, but it had been found absolutely necessary to have the chips thin or there would be great loss.

Mr. Leon F. Hauptman said he had just returned from Fort Scott, Kansas, and described the cutters used there last season, including a blower to remove the leaves and trash, when a steam ensilage cutter was used to slice the cane. He would put up such a cutter at Col. E. H. Cunningham's Sugar Land Plantation in Texas, where a large diffusion battery would be erected.

Mr. Wm. Golding said he observed serious defects in the diffusion battery at Magnolia, especially in the mode of discharging the exhausted chips. He thought they should be removed from the top instead of the bottom; they could be compressed in a cylinder and come out comparatively dry and ready to burn or use as a fertilizer as thought most advantage-

ous. At Magnolia opening to receive sliced cane was too small, and the change of cells could not be uniform. There was no provision for uniform delivery of water. He had designed an improved diffusion battery, and invited members to look at it at the close of the meeting.

Mr. Zenor asked if it required as much labor to diffuse bagasse as the whole cane?

Mr. Golding thought it would, double as much.

The Chair stated that the desire of Dr. Wiley, in introducing the diffusion process, was to get rid of the mill. Planters cannot afford to run an expensive diffusion plant and an equally expensive milling plant.

Mr. D. D. Colcock said that in Java experiments were being made in diffusing bagasse, and promised to report results.

On motion of Mr. Henry McCall, a vote of thanks was tendered Messrs. Wilkinson and Warmoth, and their papers ordered published.

Mr. P. E. Beauvais then read a paper on hydraulic pressure for extraction of cane juice.

Mr. President and Members of the Louisiana Sugar Planters' Association:

As every one interested has been casting about to find something to replace the antiquated three roller mill in the extraction of juice from the cane, I, as one of the fraternity, have also been making experiments to that end, on bagasse with the hydraulic press, and I will give you the result of my experiments on an ordinary oil press, with woolen bags and hair pads, which was not a fair test. With a pressure of 4,000 pounds to the square inch on the ram, but only 1,674 pounds on the substance under pressure, I obtained from bagasse of seventy-four pounds extraction, nine and one-third pounds more juice, making, with the seventy-four of the mill $83\frac{1}{3}$ per cent. Not satisfied with this result I corresponded with a manufacturer of presses to find out if I could get fifty per cent more pressure. He said: "If you must have more pressure, make your ram seventeen inches in diameter, area 227 inches, with 6,000 pounds pressure to the square inch; area of press 227—same as before, you will have 5,044 pounds on your material under pressure—more than three times your original pressure. There is no difficulty in making any of the above given presses; the only difference will be in their cost, which will be quite large."

Now, Mr. President, if, with a pressure of 1,674 pounds to the square inch on bagasse of seventy-four pounds extraction I extracted nine and one-third pounds of juice, how much more would have been obtained with a pressure of 5,044 pounds to the square inch on the bagasse, and how solid would be the bagasse caked? My opinion is that it would come out of the

press with not more than two pounds of the juice left in it, and would handle and burn like dry fire-wood and, pound for pound would be 25 per cent better than coal.

Let us calculate from another standpoint. Take an average extraction for all the sugar houses in the State—58 or 60 per cent—well then, had I made my experiment on bagasse of sixty pounds extraction, I would have pressed out all the juice from a 60 to a 74 per cent extraction, which is fourteen pounds added to nine and one-third would make twenty-three and one-third pounds extracted by the press; so you see, if we only use our small press of 1,674 pounds to the square inch on the bagasse, we get very interesting figures. I will illustrate it in this way: Suppose a planter with a crop of 6,000 tons of cane, grind it with a mill of 60 per cent extraction, gets the average of sugar per ton for 1886, he will get 116 pounds sugar per ton, making 696,000 pounds of sugar and 48,720 gallons of molasses. If he sells his sugar for five cents and his molasses at thirty cents per gallon, he will realize \$49,416. In the meantime, if we have placed back of this mill five of our small presses, costing about \$6,000, and operated by ten men on and ten men off at \$2 per day per man for sixty days, making \$2,400 for labor to run the presses, we would have saved \$19,217 worth of sugar and molasses. If this planter is still throwing away his bagasse, as many are yet doing, he must consume at least fifteen barrels of coal per 1,000 pounds of sugar. By pressing his bagasse, we make it equal to this amount of coal, which at forty cents per barrel, would give the additional sum of \$4,176 to be credited to the presses, which added to the \$19,217 will run up to \$23,393. From this deduct cost of presses, cost of running them, and you still have \$14,993 left.

Now, Mr. President, can you or any one present name any instrument in a sugar house or on a plantation that will more than twice pay for itself in one season? You cannot, but the hydraulic presses, if put in the sugar houses, will do it and more too.

To do good work, and work automatically, a cutter will have to be placed between the mill and presses to cut the bagasse, and this leads us to the following and most natural train of reflection: If, to get all the juice out of the cane, we must set hydraulic presses after our mills; and if, to prepare our bagasse for the presses, we have to set cutters (saws or knives) between mill and presses, why not simply place the cutter in place of the mill and cut the canes right from the carrier and send the chips direct to the presses and let that instrument do all the extracting, and at once deliver the bagasse cakes to the fireman, or better, to the hopper on the boilers?

If the presses are able to extract the last third of the juice; they certainly ought to be able to press out the two first ones,

If cutters are successfully used for diffusion, they certainly ought to be as practicable for the hydraulic presses. To say that presses will cost too much, will work too slow or will take too much labor, is simply talking without figuring. That the cutter and hydraulic press are destined to revolutionize the industry is very certain. They will dispense with the mill and all its heavy cost of keeping; they will do away with the new-comer—the shredder; they will obviate the use of the second mill and its troubles; they will do all that was intended to be done by the three-roller mill—practically press out all the juice in the cane and make perfect bagasse fuel (both of which the mill never did), do it with less labor and 50 per cent less power; will work with such constant power and clock-work regularity that the time of manufacturing the crop will be shortened by 25 per cent; will do away with half of the mill's engines, half of the mill's boilers, do entirely away with the very costly bagasse furnace, and blower and engine; do away with all heavy breakages; will cost about 50 per cent of the old affair; will entirely suppress the coal bill; will add very nearly one-half more sugar and molasses, and will have added to the crop all the profit attached to it. Mr. President, I predict that within five years after this cutter and hydraulic press system of juice extraction is practically tested on a plantation, there will be five sugar houses in operation to one now, for it will be within the reach of the small as well as the large planter.

If agreeable to the Association, at a future meeting, a detail plan of a complete apparatus, from the cane carrier to the hopper on the boiler, will be exhibited, and I hope to be able to give estimates of cost of different sizes of apparatus set up ready to run, together with their capacity of tons of cane per day, amount of extraction and value of bagasse fuel produced by each one.

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PEN PICTURE OF CUBA AND CUBAN SUGAR PLANTATIONS.

GUINES, CUBA. March 13, 1888.

Well might the great Humboldt, prosaic as he was, for once become enthusiastic over the valley of Guines, the richest and most beautiful of all the world's valleys. Here are the mountains that lay like an impenetrable wall between this wonderful garden and the north, forever barring out all chilling winds, and giving a thousands lazy Monteros vine-clad homes adown their blooming sides, fairer than the peasants' home-nests in dreamland Andalusia. To the south sweeps another bold range, bathed in blue mists, lying there like an eternal dream, half

hiding another one thousand Monteros' homes, cascades, villas and mountain chapels, white as the face of a saint against the cowling of perennial verdure. Far to the west, another range, through which refreshing streams come leaping down to the shining valley. Far to the east, still other mountains, over which the sun rises in royal splendor; and winding with stately grace comes the broad river Santa Catalina, gleaming like a great bed of silver, and pushing the crooning wheels of a hundred diminutive, ancient mills. The quaint old church of this Moorish town is called San Julien de los Guines, or St. Julien of the Reeds—Guines, being named from guines, the reeds, which grew along the banks of the Santa Catalina in the days of Columbus and Velasquez.

Guines seems a thousand years old. Yet it has the fair, bright ways of perennial youth. But think of the marvellous productiveness of this wonderful Valley of Guines, as it is, and what it might be in the hands of a people who have wrung from the comparatively unwilling soil of the Mokawk and Cumberland Valleys such noble prosperity and store. The entire valley has an area equivalent to forty miles square; is susceptible of easy irrigation; yields ceaselessly to constant cultivation; produces three crops of corn and all vegetables annually; while the average depth of this, the richest soil on the earth, is upward of thirty-six feet!

The tourist who visits Cuba, sits under the great porches of the Gran Hotel Pasaje, quarrelling with beggars and coachmen, during the three lay-days of a steamer, and, maybe, sees Colon cemetery, the Governor-General's quinta, a bull-fight and possibly a twopenny plantation just beyond the dreary Havana hills, feels sure he has seen Cuba. But he knows nothing of the island and its marvelous possibilities in the hands of good government and earnest citizens, until the heart of the island and its actual resources are seen and comprehended. The great plantations in this valley alone, like El Bilboa, Alejandria and Amistad, are simply astounding in their areas, equipment, forces of laborers and annual yield. Some of them would cover three or four American townships in area, indeed, half of many of our counties, and the populations of each would frequently suffice for incorporating an American "city."

Though natural conditions should make this Island, with Louisiana, the sugar-house of the whole world, there is no profit in Cuban sugar-raising to-day. "*Cuba es la vaca de Espana. Pero hace tiempo que la vaca no la leche*"—"Cuba is Spain's cow. But she was a long time ago milked dry"—is a Cuban saying, grown out of a governmental pillage so long, so comprehensive and merciless, that any other people would have gone mad beneath it. Half of the vast estates have been robbed by Spanish taxation here until worthless, then confiscated,

then sold for a pittance to plundering Spaniards in league with the taxing powers, and these Spaniards, in turn, are now, in common with Cubans who have so far survived, being ruined by the final, fiercest pillagings by the very power which made their own villainy possible.

The Government planters' taxes are enormous. Merchants are chary of making advances under liability of Government seizure for those taxes. Labor is constantly higher, though gold is constantly dearer. It costs more for an arroba of tasajo or jerked beef with which to feed hands than the planter gets for an arroba of sugar produced by that labor. And only because the planter has from a half million to a million dollars already sunk in land and machinery, can he struggle on and squeeze out another and another crop—praying, as hardly another human can, that, by some providence of God, the next year the Cross of St. George, or the Stars and Stripes may float above him. Over 90 per cent of all Cuban sugar is consumed by the United States. Cuba is *now* ours, commercially speaking.

Though sugar-planting was begun in Cuba just two hundred and ninety-two years ago, it is only within a few years that the great improvements which have made the industry possible on so gigantic a scale have been introduced. The old "bull mill" turned by oxen, as in the Southern States before the war, is by no means forgotten, and the "Jamaica train" methods of grinding, boiling and granulating are still more recent. On some of the smaller estates these are still in use. But on all the great plantations tremendous engines and machinery are now in operation, and on many, like that of El Bilboa, where, by the Deronee system the complete manufacture of all grades of sugar from the raw cane is effected, the plant has cost \$250,000, the annual outlay being also fully that sum for labor and other expenses. Great ado is made in the States where "farmer kings," as in Dakota, use a hundred reapers in the harvest-field and muster five hundred hands. Here fifteen hundred to two thousand hands are required in the labor upon the larger sugar plantations.

As with sugar, the greatest impetus to coffee-raising has been comparatively recent, and while coffee bears no important part in the export showing of the island, it is still considerable of an industry, owing its origin here to the revolution in San Domingo, which forced thousands of refugees, expert coffee-growers, to the eastern and southern parts of Cuba. The cultivation of the coffee-plant was thus begun on a large scale, but the ravages of war during the late Cuban insurrections nearly exterminated the industry.

All large Cuban sugar plantations are alike. Having seen one you have seen all, so far as external affairs are concerned.

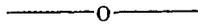
There is on nearly every plantation the ruins of the old-fashioned sugar mill, where in former days the excitement and glare and stirrings and endless yells for "*mas candela!*"—more fire—from the imps of darkness who in the flashes and shadows poked and gaumed with long poles the thickening juice; and on not a few estates you will see the great rickety sheds called the "purging-house," where huge sheet-iron vessels, shaped like the old-fashioned funnel with which you run buttermilk into your jugs in harvest-time, are now standing. Into these the crude sugar was formerly put until they were nearly full. A few inches of damp clay were then smeared on top, and the water from the clay cleansed the crudities from the sugar. The refinement was in proportion to the number of applications of this clay and water. But the present process has taken all the poetry and clay out of sugar-making. It is a very business-like matter from start to finish.

The plantation is divided into numberless squares or patches, around and from which, leading direct to the mill, are *guarda royos* or roads, which are frequently tramways with iron-bound wooden rails, where one mule can easily amble along with 10,000 pounds of the glistening cane on cars. Frequently these *guarda rayos* radiate in all directions from the batey or square like the spokes of a wheel. It is one steady stream of cane day and night to the ponderous rolls, which squeeze it dry as a bone, whether it come fast or slowly, endwise or sidewise, and leave the rag-like, crushed and flattened stalk in what is called *bagazo*. This, dried in the sun, provides the entire fuel for the never-idle boilers. The screaming and whining of these crushing rolls is one of the most lugubrious noises you ever listened to, and can be heard night and day for dreary miles, recalling the groaning and crying of one of those old Red River trains that have now been driven beyond the far Saskatchewan. Then there are the tremendous engines and boilers kept endlessly raging by the burning *bagazo*; countless pipes and fixtures, and the huge nickel-plated vacuum pans, embedded in polished wood, where the cane-juice, seemingly quiet, is kept at a fearful heat by steam; the great vats and reservoirs, and finally, the swirling, whirling centrifugal machines that, inside of five minutes, take the black, nasty, mushy mess and beat it until it is as white as snow and ready for market, and brings, at the nearest seaport city, from four to five cents a pound. From four million to five million pounds are frequently made annually upon each of these plantations, besides the enormous yield of molasses, which is an important factor in the crop.

The fact is, these great sugar estates are now run on so gigantic a scale that they are little less than huge factories, with all the hard characteristics of factory life about them,

the home or rural idea being wholly eliminated. The place is like a factory village, employing and caring for from one to two thousand souls. The discipline is severe; the system perfect. The hands are invariably negroes. They work in watches or relays, day and night, precisely as they do at rolling-mills during the grinding season. The males occupy quarters walled and barricaded from the women, the women from the men, and there is no more chance for intercourse or frolic than in the American penitentiary. Those married have separate quarters. The old "mammies" are set at "minding" the pickaninnies during the day, which are only turned over to the parents at night. The broken down and imbecile have an asylum. Probably no village containing a like number of people has the same systematic surveillance and care. There is an infirmary, a lying-in hospital, physician, apothecary, a chapel and priest. At night and morning mass is said in chapel, and the crowds are always large. There is of a Sunday less restraint, though this under ceaseless espionage. On these days and in parts of holidays there is rude mirth, rude music, much dancing and cavorting. But with all the wealth, all the aggregation of busy beings, all the elegance that you will find at the house of the nabob propietario, all the exuberance of nature in her ever-glowing moods, all the singing of birds in their endless summer here, all the glory of flower, and sun, and air—you will never find genuine human joy on the Cuban sugar plantation.

One little old American farmhouse that I can see in one little vale way back across the years held more comfort and heart-hope and cheer in one day than ever came to this Cuban luxuriance in all the centuries.—*Cor. of S. F. Bulletin.*



RAMIE CULTURE IN GUATEMALA.

A writer in the *Kern County Californian* gives an account of the visit of a gentleman, Mr. J. B. Burrell, to Guatemala to ascertain from actual observation the results of cultivating ramie, rubber and cacao. We copy so much of this report as relates to ramie and incidentally to cacao.

"Mr. Burrell stopped at the plantation of Messrs. Machelaere & Co., Escuintla, Guatemala, and there he had the best chance he had found in all his trip (it being the last place he stopped at) for making his observations in cacao and ramie. This firm has about 200 acres of cacao and over 100 acres of ramie planted—probably the largest amount of either which can be found planted in one place anywhere in the world, and as the gentlemen were very enthusiastic and obliging, they gave Mr. Burrell every information in their power, and he remained

there one week examining their place and making his calculations from actual working results. Their principal business is cacao, and they are making money from that which was planted first—six years ago—but most of it is too young to bear much. The ramie was planted as an experiment about three years ago, for the purpose of finding something that would bring quicker returns and thus help pay the expense of taking care of the cacao. The experiment proved such a success that it was made into a business, and to-day they are planting more ramie than cacao. Mr. Machelaere has invented a machine for extracting the fiber which works well, turning out 1,000 pounds in 10 hours without breaking or injuring the fiber in the least, the stocks being put into it green and dried in the sun half a day, when it is ready to ship. Mr. B. tested its results thoroughly, going into the field himself, measuring off a piece of ground with ramie sixty days old on it. He cut and weighed the stocks, ran them through the machine, dried them and then weighed them again, and from the result he finds that the green stocks yield $8\frac{1}{2}$ per cent. of the dried fiber, and that the yield of one acre of sixty days' growth is 5,000 pounds of dried fiber to one acre, which was about the same as the gentleman had told him. He was informed that the fiber was better to be cut at sixty days' growth than to be older, and where they irrigated the ramie it yielded six crops per year, and he could not doubt it, as the ramie he had cut was grown entirely in the dry season. Mr. Machelaere has several orders for his machines, which he sells for \$1,500, and offers to take his pay in ramie at 4 cents per pound, delivered at any city or port from whence it can be shipped with facility. Ramie is very easily propagated; not by roots, which takes too long, but by laying the stalks in the ground about three feet one row from the other, and should be kept moist and well cleaned for the first five months. Three months from time of planting it must be cut, and the stocks of this crop are fit for nothing but to plant. Two months later the first crop is ready for the mill and market—always provided that it is planted in the proper location and has proper care—and thereafter every two months a new crop is cut. One of Machelaere's machines works the product of twenty acres of ground, and to keep twenty acres in order, cut and carry to mill, run it through and dry it, bale it, etc., fifteen men are necessary constantly, besides horses and carts. Here the trouble ends, for when once ready to ship the money begins to come very fast, as there is unlimited market for the fiber both in England and in France.

“It may not be amiss to give some figures to show what can be done with ramie in this section, and in order to be sure that there is no overestimate, I only calculate on four crops to the year and the crop only 4,000 pounds, and although the

price in England is said to be 22 cents per pound, I put it at 4 cents, as offered us by Machelaere & Co. I do not count the value of land, as plenty can be bought at from \$1 to \$2 per acre on ten years' time; neither do I count the value of the owner's time, who is supposed to oversee the work. The figures are as follows:

	Per acre.
Clearing the ground in good shape.....	\$10
Plants of ramie.....	6
Planting same.....	5
Keeping ground clean for five months.....	12

The necessary outlay on one acre until ready to cut amounting to \$33 50 could be reduced to \$20 or \$25 if animals and plow are used.

One machine costs, with power.....	\$ 2,000 00
Cost of cleaning and tending 20 acres of ramie until ready for the mill at \$33 50 per acre.....	600 00
Wages of fifteen men from the time mill commences work until first returns should come from Europe, say fifteen men at 50 cents per day for four months.....	780 00
Cost of living of owner for one year, say.....	600 00

Total investment necessary for twenty acres.....\$ 4,000 00

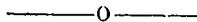
RETURNS.

Twenty acres, four crops, of 4,000 lbs. per acre each at 4 cts. per lb.....	\$12,800 00
Expense of fifteen men at 50 cents each per day for one year, \$2,300; expense of owner, \$600.....	2,940 00
Net income for one year.....	\$ 9,860 00

"Thus it will be seen that with a capital of \$4,000 a person may in one year have his ramie farm in a paying condition, and in two years find himself with his farm paid for and about \$10,000 in pocket, as he can at least get two crops the first year, which, with the second year's income, will make \$14,790, less amount of investment, leaves \$10,740 and a never-failing income in the neighborhood of \$10,000 per year.

"Ramie does not need planting but once, and after it fairly gets started, say in five months, does not require any cleaning—nothing to do but to see that it has proper moisture, cut it, put through the machine, and last, but not the least pleasant of all, to sell it.

"Our soil and climate are specially adapted to it here, there being plenty of moisture and no frosts, and it is destined to be an important industry here very soon."



It is said that for years there has been held before the eyes of ambitious investors an offer of a prize of \$10,000 for the first ten bales of jute grown and prepared for market in the United States at a cost which will admit of successful competition with the Indian article, but the price is still unearned,

MY EXPERIMENT WITH COFFEE.

EDITOR PLANTERS' MONTHLY :

It is not usual, nor agreeable to chronicle one's failures. But as there is an effort to be made in the line of coffee culture, stimulated by the high prices now ruling, I have set myself to the unwelcome task. There may be differences which would render my experiences of no value at the present time. If so, such differences should be taken into the account; and my experiment should form no argument against further trial, but serve rather as a stimulus to secure success.

Almost from my coming to Wailuku in 1840, I had coffee-trees in my garden. I gave them careful culture, though they were not greatly stimulated by manuring. We had all the coffee we needed, and more; I sometimes gathered ten pounds of good, cleaned coffee from one tree; but it was only in a few cases that they produced so much. I think I had only about thirty trees, but they produced about 200 pounds a year.

Owing to certain changes, I was, after a time, obliged to look round for some means of living; and seeing the coffee did so well, a long calculation was not necessary to decide me to start a coffee plantation. I should say here, that the quality of the coffee we raised was, in our estimation, a little in advance of anything we knew in that line. So, little by little, I put out more trees, giving them the best possible cultivation, and they showed great promise; commencing to bear in the third year.

In 1858 I made a visit to my native land; and almost the first word I received from the Islands was that my coffee-trees were all dead;—which on my return I found to be a matter of sober fact. Other plantations too, had suffered; but as I know less about them, I will confine my remarks to my own. The cause of the death of my trees was not far to seek. Numerous species of *coccus*, (plant scale) appeared at that time, so that, not only was the coffee killed, but many other plants were loaded with them and suffered greatly. Some of the species of *coccus* were very large, larger than I have seen before or since; and many species which were very abundant for a few years, have long since disappeared. The "red spider" also abounded at that time and was very destructive. It was the era of pests.

But that which did more damage than all other things together, which has never ceased its pernicious work, but still continues the prime pest of coffee, as well as many other things was the "mealy-bug," or "white aphis," a *coccus* for which, so far as I know, no effectual remedy has been found successful here. A few coffee trees which hang around their old haunts in my garden, refuse to bear more than a few stunted berries,—the "real Java," if I am rightly informed,

I have given my experience above, not with a design to discourage any efforts that may be made by others in planting coffee, but that they may take measures to guard against these pests promptly when they appear, as there are remedies used which are said to be effective in other countries, and which ought to be secured and tried here when it becomes necessary.

E. BAILEY.

Wailuku, Maui, April, 1888.

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FIBRE-BEARING PLANTS.

There has long existed a widespread belief among the more progressive citizens of Florida that the great quantities of fibrous plants annually going to waste, might be very profitably used in the production of manufactured goods. There are not only numerous plants indigenous to, or that may be cultivated in Florida, which produce excellent fibrous material, but others could be readily introduced. The want of proper machinery has hitherto stood in the way of their utilization. It is expedient that such raw material, from the very nature of the case, should be reduced to fibre near where they grow, and this has up to the present time, been too tedious and expensive to make it a desirable source of profit.

This difficulty has now been overcome by the invention of a fibre-cleaning machine, that is the key to a most valuable industry in the State. The new machine which is applicable to all fibrous plants, has been invented and patented by D. P. Burdon, of Sanford, Florida. The process is rapid and effectual. In ten minutes the raw material can be converted into beautiful specimens of fibre, and ready for the various uses to which it may be applied. The machine does this equally well, whether it be Sisal hemp, Spanish maguey, palmetto, yucca, pineapple or bear-grass. The fibre thus produced seems to be so clean and perfect, it is in all respects equal to hemp or jute, for the manufacture of cordage, bagging and similar purposes, while an additional process renders it suitable for making a much finer grade of goods.

A machine that can take the green rib of a palmetto leaf, and in ten minutes reduce it to a valuable textile fabric, is indeed among the great inventions of the age. Florida is full of fibrous plants, growing spontaneously, and there are others that might be introduced to which the process may be applied, and the temper and spirit of the people is much mistaken if they long neglect the establishment of manufactories in which this machine will be the leading feature. This is no "puff" from sordid pecuniary motive, nor yet for the sake of friendship, but

the incentive—and it is a strong one—is the promotion of the general welfare of the community.

There are two circumstances that will go far to make the application of this machine, for the purpose intended, a triumphant success—no lack of material, and an unlimited demand for the manufactured material. All that remains is to demonstrate its full possibilities and employ it extensively in what must eventually be one of the great industries of the Floral State, which, as already stated is so well adapted to the entire range of fibre-producing plants. Thus, the Burdon Fibre Machine, which is both for cleaning and washing, will be another and a potent agency in giving us what is so much desired—diversified industries. None can doubt the utility of such an invention right here in semi-tropical Florida, as no other part of the globe already furnishes so many valuable fibrous plants.

The fibre produced in so short a time from the Spanish maguey, samples of which have been seen measuring thirty-six inches in length, is as pliable as thread and as tough as wire. There is now fair promise that when this new industry is fairly inaugurated it will be of even greater importance than orange growing, inasmuch as it may yet command more attention and insure the investment of more capital. The severe “freeze” of last winter a year ago, did much to direct the public mind to the vast and varied resources of the State outside of citrus fruits. Not merely from the plants named above, but from the banana and cocoanut, as well as many other plants now grown, can these fibres be readily obtained. Some of them, it may be added, are almost exquisite in their texture and fineness, and susceptible of being made into the most delicate fabrics, while retaining their remarkable strength and tenacity. It may also be said that the best of paper can be made from certain species of them, among which is yucca and the saw palmetto. Even a comparatively small proportion of the fibrous waste of the State, thus utilized, would be a source of enormous revenue to the commonwealth.

As an evidence of how widely other materials than cotton and wool may enter into manufactured textile articles, it may be mentioned that even *grass cloth* is fast increasing in demand. It is a Chinese production, specimens of which come to us, generally, in the form of handkerchiefs. The material is a fibre—not grass exactly—but a species of nettles free from the stinging qualities of the ordinary ones. They are carefully cultivated in China, where they grow in great quantities, as they do in India and other tropical and semi-tropical countries. In Ceylon and India, where these nettles also grow wild, they are cut about the time of seeding, bleached by the assistance of the heavy night-dews, and the hot midday sun. The fibres are

then gathered and spun into ropes of thin twine, from which coarse matting is made.

This primitive mode of treating the nettles is not followed in China, and indeed, the employment of the "fibre silk" for commercial purposes seems to be a Chinese secret. Not only is the texture of the cloth manufactured from this fibre very beautiful and remarkable for its splended gloss and peculiar transparency, but it is likewise, extremely strong and durable. Belting for machinery has already been made with the China grass fibre; and in being tested it was found that it could bear a strain of 8,326 pounds to the square inch, whereas, leather only sustains a pressure of 4,249 pounds to the square inch. The new article will soon be in great demand. The foregoing facts show what a wide field of effort lies before us in the production and use of fibre-bearing plants and indicates that they might readily be rendered the source of a great national industry, second only to the cotton interest. But there is still something else.

The growth and manufacture of both ramie and jute are attracting steadily increasing attention in the Southern States, and the time is not far distant when there will be established large manufactories for them: The great want has been a proper decorticating machine. This difficulty has been met in this instance also, by Mr. Burdon's invention. Ramie will grow successfully as far north as North Carolina, and from Georgia and Florida across the continent to California. There are numerous plantations of it already in South Carolina, Georgia and Louisiana; and in its manufactured form it can be used for a vast variety of purposes.

Jute, likewise, which is largely produced in India, must eventually be raised in the southern portion of the United States. Jute, to the value of millions of dollars is annually imported from foreign lands, and the importance of its home production cannot be over-estimated.

It is the Spanish Maguey, however,—the "king of fibres,"—that must finally command the most extensive cultivation in Florida, of the entire range of fibrous plants. The advantages of its fibre are so numerous and important that they will doubtless cause it to be largely cultivated within the limits of this State, beyond which, northward, it cannot be successfully grown. An enumeration of these advantages, is reserved for another occasion. Quite a large but scattered acreage has been planted in South Florida, with the Spanish Maguey, while there are thousands of acres of it growing wild in the extreme southern part of the State. It has before it a grand future.

The now useless yucca, can be readily utilized in making paper pulp. The annexed item comes to us from the *Sacramento Bee*: "Two tons of yucca pulp are daily worked up in

the Mohave desert and sent to the paper-mills near San Jose where it is converted into manila wrapping paper. About twenty men are employed in the manufacture of the pulp. Ere long the manufacture of printing paper and note paper will be commenced, and it is safe to prophesy that soon the manufactures from this plant will afford employment for thousands of men. The supply of material is unlimited." Comment is needless—these facts speak for themselves!

Finally, our abundant, offensively intrusive saw palmetto, can be made into the finest of writing paper,—as has been amply demonstrated by successful experiment in Florida. The time is not distant when the saw palmetto will be extensively gathered for this purpose, and it will be largely converted into paper of various grades, at paper mills located in sundry portions of the State. To foster such fibre-producing industries as these, an immense amount of capital will flow in upon us and the "long felt want" of diversified industries will be far more fully supplied than at present. A brighter era than ever before has dawned for Florida, and the future is full of promise.—*Cor. of Florida Agriculturist.*

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WASTE IN THE SUGAR-HOUSE.

MR. EDITOR.—Let me dip my spoon into your Sugar-Bowl, adding thereto a mixture of the practical and theoretical with random thoughts suggested thereby.

Do the sugar planters, as a body, ever stop to think of the fact that for every 100 pounds of available sugar (taking the average of the entire sugar-belt of Louisiana) they place under the cane shed, only about fifty pounds of it finds its way to the hogshead or barrel. While I loudly echo the field in its cry of "fertilize to increase saccharine matter in the cane," I supplement it with a war-whoop of a yell to stop the waste in the sugar-house.

Science and practice—in their parallel representations of the chemist and planter—seem to be butting their heads together somewhat after the manner of a free fight, with a great deal of the bull-dog tenacity on either side; whereas, it would be far more to the interest of each, and the sugar industry of Louisiana, were they to clasp hands in a brotherly grasp and each be taught by the other. Comparatively, the chemist can quickly make his tests and analyses, yet in practical agriculture, these cannot be accepted in full faith, till verified by the planter, for there are hidden factors, the results from which, may often be seen embodied in the notions of some "old codger of a planter," before the chemist suspects their presence, and right here the chemist can be taught valuable chemical facts by

these very "notions" of the practical planter. But, my "old codger" friend, old or young, don't you become conceited by this admission, and with a shrug of your shoulders, turn up your nose at the man of blue and red paper, jars, bottles, chemicals, polariscope, microscope, etc., etc., for by these very things the chemist can teach you—teach how you may be saved years of fruitless labor.

Just here, let me digress a little, and then I'll go back to "waste in the sugar-house." Agassiz, the great naturalist, remarked of himself, that he had "no time to make money," and this may be said of any true scientist, for his entire time and energy are given up to the one object, search of truth—truth in science, and that he is an unpaid worker for the good of all. Let this be remembered, and *paeso* not too heavily the *res angusta domi* of the scientist, when his services are called for. The Louisiana Experimental Sugar Station is a grand move in the right direction. While I know nothing of its financial foundation, let me suggest that it be supported with a liberality which will justify the furnishing every facility demanded, by the refinements of modern chemical science—aye, do more than this. Place the Mother Station on such a financial basis, that during the rolling season it may be able to plant sub-stations at suitable locations for sugar-house work, and let each be supplied with a good outfit for all ordinary sugar-house chemical work, leaving exceptional work to be referred to the more extended facilities of the Mother Station. This placing a polariscope under one arm, litmus paper in the vest pocket, a pair of scales and a bottle or two in the overcoat pocket and jumping from plantation to plantation, presents a better picture for the fake than to the scientist. But to the "waste in the sugar-house:"

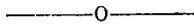
'Tis said that 65 per cent. of juice can be extracted by the three-roller mill, and 78 per cent. by the five-roller. Do we get it? Think it over in connection with the fact that diffusion extracts all the juice from cane, to within less than one per cent. and then perhaps we will question if the average is 60 per cent. of what it might be. While there need not be much loss with a good vacuum pan, triple effect, etc., etc., notice the increased waste as we descend through the open steam train, strike pan, etc., to the full set of open kettles. "Any more waste?" Yes, look at your skim ditch. "Oh! I use the filter press." Well, they are a good thing, and save if properly handled, but if not properly manipulated, they are a source of greater waste, physically and chemically, then—"let it run in the skim ditch." Do you ask if I am now ready to take my spoon out of your bowl? No; the caption of this little talk brings me to a subject which may lead to my hair being (metaphorically) pulled by a portion of both, the planters

and chemists, yet I must dose the cane juice with sulphur fumes. Fifteen years of practical use, a good deal of microscopy and a little chemistry, make me emphatic in saying that impregnating cane juice with sulphur fumes to nearly saturation at 60° Fahrenheit, prevents a great waste or loss which would otherwise arise from inversion. That there is such a difference of opinion among practical planters in the use of sulphur, may be traced to the manner of using it, for too often when they think they are impregnating the juice with sulphur fumes, they are decomposing it by sulphuric acid. While not denying the general principal that acids invert, I contend, microscopically, that there is in cane juice a plant germ, which, through and by fermentation becomes a far more powerful inverting agent than sulphurous acid gas, (sulphur fumes) *per se*. The sulphurous acid gas destroys these plant germs, which to designate from "revelations of the microscope," I give the name *Invertens Taylorii*, being a privilege accorded by original research. (Note—these plant germs are not *saccharomyces cerevisire*, *penicillium crustacium*, etc., being so small that it requires a first-class homogeneous lens of high power to study their life history, cultivation, etc., whereas the others are comparatively larger, varying from 1-2500 to 1-25,000 of an inch in diameter, the spores of *Invertens Taylorii*, when seen in their earliest stages, are about 1-100,000 of an inch in diameter. This is the size of the germ as inherent in the cane, yet in being exposed to the air, they rapidly grow to be as large as 1-50,000 of an inch, and even larger, depending upon their varied pabulum which they receive by the wonderful laws of diffusion. (But I desist, as this parenthetical note begins to look like saddling the microscopical hobby-horse.)' Altho' these little imps are so small, they are a "power of inversion," when left to themselves. Whether or not sulphur fumes arrest their onward course of inversion, let chemistry speak a word or two. Below are three analyses of identically one and the same juice, the analysis of each being carefully made by both the polariscope and chemical reaction, and not as is frequently the case, a part by the polariscope and the balance guessed at. Analysis No. 1 is juice just from the cane mill; No. 2, the same juice after standing 24 hours; No. 3, the same juice after standing 24 hours, but was treated with sulphur fumes immediately after leaving the mill. The temperature of juice when sampled, was 50° Fahrenheit, but each analysis was made at 60° Farenheit, the temperature varying during the 24 hours from 40° to 60° Fahrenheit.

	Sucrose.	Glucose.	Per cent. of glucose to sucrose.	Co-efficient of purity.	Available sugar from ton of cane at 75 per cent extraction.
No. 1.....	13.4	1.69	12.6	81	162 lbs.
No. 2.....	11.9	3.70	32.36	75	95 "
No. 3.....	13.0	1.75	12.0	82	156 "

Now, if sulphur fumes have not been the cause of it, why does the percentage of glucose to sucrose in No. 3 (sulphured) stand only 13, while No. 2 (unsulphured) has inverted to 32.36, equal in this case to a loss of sugar in 24 hours of 61 lbs. per ton of cane. Compare pounds of sugar in No. 2, 95 lbs., with No. 3, 156 lbs., and you will see it is a loss of 40 per cent. Again, compare pounds of sugar of No. 3, sulphured, but had been standing 24 hours, with No. 1, direct from the mill spout, and the loss in pounds of sugar is less than 4. Which, compared with 40 per cent. loss of No. 2, shows a saving of 36 per cent. of sugar in this case, which is passed to the credit of sulphur fumes. I do not pretend to say that sulphur will not be superceded by something better; but, under our present methods of manipulating cane juice, as per the facilities of the average sugar houses of Louisiana at this date, give me sulphur, properly used, for the greater profit in dollars and cents, when the sugar house account is balanced.

We look with astonishment at the diffusion yield of 231 lbs. to the ton of cane, at the Government Station at Lawrence the the past season; yet, if the planter, chemist and mechanic will work in harmony, I can clearly see in the future that 250 lbs. of sugar to the ton of cane, would be no astonishing result in Louisiana. With this thought, I withdraw my spoon from your Sugar-Bowl.—*Cor. Sugar-Bowl.*



THE WINE AND FRUIT TRADE WITH ENGLAND.

The following extracts from the report of the New South Wales Commission for the Colonial and Indian Exhibition of 1886 will be of interest to our readers:—

COLONIAL WINES.

As an indication of the stimulus which the holding of the Colonial and Indian Exhibition gave to the colonial wine trade, the following extract from the Board of Trade returns, published March, 1887, showing imports of Australian wines for the three months ending 31st March, for the last three years, may prove of interest:—1885, 15,897 gallons; 1886, 38,610 gallons; 1877, 33,888 gallons. The large importation in 1886 was due to shipments sent forward in anticipation of the Colonial and Indian Exhibition, and a quantity quite equal to the excess of that year over 1885 remained in bond. On the other hand, the whole of the quantity landed in 1887 has gone into consumption on arrival; besides which duty has been paid during this period on more than 10,000 gallons of the wine bonded in February and March, 1886, thus bringing the consumption for the first three months of 1887 up to at least

45,000 gallons, or about three times the total importation for the first three months of 1885, *i. e.*, before the influence of the Colonial and Indian Exhibition had manifested itself.

NEW SOUTH WALES FRUIT.

The fruit which arrived in the Exhibition from this colony was not offered for sale, but was exhibited in the Court and at the Royal Horticultural Society's shows. Eleven cases of apples and quinces arrived in London at the end of May, the remainder of the fruit in August and September, and the passion fruit in October. All the fruit was stored in cold chambers during transit, and, as a whole, arrived in good condition. The packing had been carefully attended to, and the appearance and quality of the fruit, with the exception of a consignment of oranges, was excellent. The apples arrived in fairly good condition, and were packed in chaff, which being of a hygroscopic character, is a dangerous material for packing. Apples might form an important article of export; the rate of freight is, on an average, £16 per ton, or for cases of the size recommended (see Notes on packing) 8s. per case. The few samples of grapes arrived in good condition, each bunch being packed in its own box in a very fine and clean sawdust. Those shown at the horticultural shows were highly commended, and the Knighton medal was awarded for the whole collection of fruit. It might be considered whether the production of raisins and currants would not prove a profitable industry, as the climate of New South Wales would appear to be favorable for curing grapes. The oranges exhibited were of exceedingly handsome appearance, large in size, dark orange in color, and of superior quality. A vote of thanks was awarded for them at the horticultural show, the most conspicuous variety being the "navel" orange. New South Wales oranges, coming in August, September and October, arrive just before the Brazilian oranges, but to judge from the first trial it seems scarcely probable that the sale will ever be of a very profitable nature. The prices obtained varied from 3s. to 8s. per case, the expense of freight being about 4s. Of shaddocks, the fruit exhibited was of medium size and good quality, and it would probably sell well in London, although more valuable for preserving purposes. The lemons were of ordinary appearance, but smaller than most of the South European fruit. Of passion fruit, most was on arrival in sound condition, though somewhat shrivelled in appearance. By careful packing in the methods proposed for peaches or grapes it would all arrive in good condition and sell well.

SUGGESTIONS FOR PACKING FRUIT FOR EXPORT.

The following suggestions for the packing of fruit for export.

are made by Mr. Gustavo Carsten, Jr., late market superintendent, but now superintendent of the Royal Victoria Gardens, Bombay:—

Apples intended for a long sea voyage should be gathered about a week previous to packing, and be carefully handled, as the slightest blow is sure to leave a brown spot and spoil the appearance of the fruit. After gathering, the fruit ought to be spread out in a single layer on perforated shelves in a cool and almost dark place. Before packing, every fruit should be thoroughly wiped with a clean linen cloth, as all fresh fruits are liable to sweat. The packing cases ought to be manufactured of strong, not too porous, thin and light boards, simply nailed together. The size used for the first trial from Victoria—24in. x 12in. x 5in.—will suit the purpose; but it is suggested that 20in. x 15in. x 6in. would be a more suitable size, and would hold say 56lb., or ten to fifteen dozens, according to the size of the apples. At the bottom of the case and along the sides should be placed sheets of paper, lined with a thin layer of cotton, wool or other soft material—hay and straw are unsuitable, being liable to decay by the influence of moisture—and then again sheets of paper. Every fruit should be wrapped up in tissue paper; they should then be placed in the case and pressed together as tightly as possible without injury. The layers of apples should be separated by double sheets of paper, and each successive layer pressed down. The last layer may be raised about $\frac{1}{2}$ in. above the margin of the case. A thin layer of cotton wool should be placed on the top, after which the lid may be nailed on, If necessary the case can be secured by bolts of iron wire. Pears: The above remarks apply to the gathering and packing of this fruit, though considering its greater tenderness, more care, if possible, should be bestowed upon it. The choice of varieties for export must be restricted to good-keeping ones. The fruit should be gathered before it has ripened. Peaches, Figs and Date Plums: The fruit should be gathered before it is ripe. The cases should be small and flat (say 12in. x 6in. x 3in.), and should be lined with tinfoil or parchment paper in order to prevent the admission of moisture, and the fruit should be wrapped in tinfoil, and packed in cotton wool tightly enough to avoid friction. Grapes: The best material for packing grapes is dry saw or cok dust. Care should be taken that the grapes are quite dry when picked, and that the packing is done in a cool and shady place in order to prevent a sudden change of temperature when the grapes are placed in the cold chamber. The most suitable size of case would probably be 10in. x 10in. x 6in., so as to allow of only two layers of grapes, and should be made of hardwood, be as tight as possible, and lined with tinfoil or parchment. The grapes should be handled with the

utmost care; all damaged berries carefully cut away, so as to prevent damage to the bloom or any worse injury. They should not be wrapped in paper. The stalks should be sealed with grafting or sealing wax. Oranges: The fruit should be gathered when just commencing to change its green color, but previous to the final process of ripening. It should be packed, like the apple, in cases of the same size, but it would be well to sort it in five different sizes, say "extra selected," "selected," "extra," "medium," and "small." In order to do this properly, it would be wise to adopt the same system that is followed in Sicily, *i. e.* to sort the fruit by the aid of various sized rings. Bananas: Bananas reach the London market chiefly from Madeira, the Azores and the West Indies. They are packed green, or half ripe, in open boxes or perforated barrels. Straw or wood shavings are used as packing material, and would answer the purpose very well for a short voyage. For long voyages the bunches should be cut when the single fruits have attained their full size, but are still quite green and hard, As with all unripe fruit they should, during the voyage, be exposed as much as possible to air and light, and should, therefore, be kept on deck. Each bunch should be protected from injury by a cylindrical cage. Before packing the bunches the cut wound of the stock should be sealed, in order to retain the sap. If sent ripe, the bananas should, in addition to sealing, be packed in saw or cork dust, or other soft material. Pineapples should be packed as bananas. The cage-like packages above referred to should, however, be rectangular, and about 20in. x 10in. x 12in. in size, so as to contain two sets of fruits. The packages should be divided in equal partitions, according to the size of the fruit, each cell containing one fruit, hanging downwards, and properly fastened by ties. If packed ripe, trouble arises in consequence of the leaves being liable to decay. Storage in Cold Chambers: A few words may be added about storage in the cold chambers of the steamers. Though most of the consignments which have arrived in the market proved to have been carefully attended to in this respect, it happened that fruits in some of them were injured through being exposed to a low temperature. As a rule most of the hardy fruits will, without harm, endure a temperature of 26° to 30°. but a temperature of 32° to 35° will be safer, and a fall below 26° will be likely to prove dangerous. In order to avoid any harm, care must be taken that the fruit on its arrival is not exposed to a sudden change of temperature, and the packages should not be undone until their contents are presumed to have acquired the temperature of the surrounding air. Any sudden change will induce the fruit to decay, or at least to lose its flavor.—*Queenslander.*

INTERESTING STATISTICS OF THE UNITED STATES.

The annual report of the Bureau of Statistics, under charge of Colonel Switzler, was issued in the latter part of February from the Government Printing Office. As usual it abounds in valuable statistics with regard to the transactions between the United States and the rest of the world. From the tables relating to imports and exports we have gathered a few statements that will be of service to our readers. These figures relate chiefly to the transactions in horses, cattle and sheep, in eggs and in potatoes. The importation of farm animals to the United States is quite large, both as "dutiabie" and as "free of duty." The latter are those imported for breeding purposes or animals owned by those emigrating to the U. S., or animals brought in for exhibition, to which a few month's stay is allowed. The animals on which duty is paid are those that are introduced under conditions different from those just named. Some two years ago, there was published in the *American Agriculturist*, an article similar to the present, and it will be well to compare them as far as possible. In the first place as to horses, imported and exported:

HORSES FREE OF DUTY—YEAR ENDING JUNE 30, 1885.

	<i>Number.</i>	<i>Value.</i>
Canada.....	3,849	976,711
Mexico.....	13,107	103,289
Great Britain.....	503	223,751
Belgium.....	39	21,748
France.....	992	589,295
Total.....	18,521	\$1,920,887

YEAR ENDING JUNE 30, 1887.

	<i>Number.</i>	<i>Value.</i>
Canada.....	5,026	1,142,221
Mexico.....	9,836	66,592
Great Britain.....	1,403	299,300
Belgium.....	74	32,544
France.....	1,479	846,342
Total.....	17,650	\$2,408,679

On the 1885 side of the above table, the average value of the imported horse is \$103, on the 1887 side it is \$137. The horses of highest valuation are from France, \$595 in 1885 and \$572 in 1887. The Belgium horses come next at \$557 and \$440. Russia also sends four horses at an average valuation of \$465. In 1885 the "dutiabie" horses numbered 21,734, and were almost entirely from Canada and Mexico. In 1887 they numbered 38,725 and came also from the same countries. The Canada horse averages \$112 and the Mexican \$9. The difference in value between the little mustang and the splendid importation from Europe, of the noble horses that are improving the American stock so wonderfully, is quite as marked as is the distinction between the animals themselves.

The export of horses last year reached the number of 1,611,

and the value of \$351,607, an average of \$218. The noticeable feature of this is that Italy took two of our horses, valued at \$4,000; the Argentine Republic three at \$3,600, Australasia three at \$3,000, Brazil twenty at \$25,000, Costa Rica two at \$1,500, and Canada 481 at \$108,053. On the whole, it was a pretty good year for the international trade in horses.

The returns of the imports of cattle dutiable and duty free are not as favorable for 1887 as for 1885. They are less in number and value, and some countries that contributed largely at the earlier date are backward now, as the following table will show:

CATTLE—YEAR ENDING JUNE 30, 1885.

	<i>Number.</i>	<i>Value.</i>
Canada.....	2,845	539,772
Mexico.....	20,400	259,054
Netherlands.....	1,663	133,194
Great Britain.....	936	201,972
Belgium.....	216	20,516
Total.....	26,342	\$1,176,717

YEAR ENDING JUNE 30, 1887.

	<i>Number.</i>	<i>Value.</i>
Canada.....	1,582	203,440
Mexico.....	11,991	117,788
Netherlands.....	93	7,306
Great Britain.....	723	83,236
Total.....	14,365	\$412,336

The average value in 1885 was \$44; in 1887 it was \$28, and the valuations in each particular country exhibit a like decadence. The "dutiable" cattle for 1887 came from Canada and Mexico, as did those of 1885. They numbered altogether 72,665. The Canada contingent is valued at an average of \$15, and the Mexican at \$6.60. The exports of cattle numbered 106,459, valued at \$9,172,136. Of these 87,757 went to England, and were valued at \$8,182,299.

SHEEP.

The sheep imported free of duty during the last fiscal year numbered 28,547, and are valued at \$57,935. The dutiable sheep numbered 451,253, and are valued at \$1,187,847. In both cases almost all these sheep came from Canada and Mexico. No animals of this class of very great value are reported. During the same period the export of sheep amounted to 121,701; of these 91,000 went to Mexico and 22,500 to British Columbia. The Argentine Republic took two breeders at \$800. Brazil paid \$15 each for 183 sheep. The returns from the sheep-rearing States of South America show that sheep-raisers are in earnest, and that they are willing to pay good prices for good stock.

MISCELLANEOUS.

The import of eggs was 13,936,054 dozen, of these 13,682,914 dozen came from Canada, while Belgium sent 130,800 dozen,

and China 107,275. The Chinese eggs were mostly landed in San Francisco for the delectation of the emigrants from the flowery land. This is shown by the fact that the return of the receipts at San Francisco is almost identical with that of the departures from China. The Canada eggs are caught at the frontier custom houses and mostly along the eastern lines beyond Ogdensburg. Regular "egg trains" are run on the railroads of that region. Our export of eggs was 372,772 dozen, of which number nearly two-thirds went to Canada.

The importation of potatoes for the fiscal year ending June, 1887, was 1,432,490 bushels, nearly all from Canada, although Scotland sent 95,000 bushels and the British West Indies 73,500. The average price of the last was more than \$1.80 a bushel. They are a very fancy stock in the household market. The failure of the potato crop last year in the United States has greatly augmented the importation from Scotland and Germany, and already during the last four or five months the import of potatoes from Great Britain is in excess of the whole importation of the year before—indeed, is larger by three or four fold. The farmers with their wealth of land and plant and product, may derive great comfort from the steady advance in the demand, at home and abroad, for all the products of the soil. How continuous this advance is, the following figures show:

	<i>Export of Agri- cultural products.</i>	<i>Total Exports.</i>	<i>Population.</i>
1860.....	\$256,560,972	\$316,242,423	31,000,000
1887.....	523,073,798	703,022,923	58,000,000

—American Agriculturist.

SUGAR IN BRAZIL.

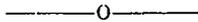
Consul-General Armstrong, at Rio de Janeiro, thus speaks of the "Sugar Industry of Brazil:"

"I have before alluded to the precarious condition of the sugar industry of this country, and to the suggestion made in the Brazilian chamber of deputies, by a prominent and influential member of that body, that his government should endeavor to obtain from the United States a reduction in the import duty on sugar, offering as a compensation to reduce the duties on American merchandise imported into Brazil.

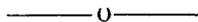
"The sugar merchants of this city recently held a meeting at which there was reached an exposition of the sugar trade, from which it appears that in some of the most important sugar districts of the empire the planters receive for their raw sugar only from one to two cents per pound, and that, in the opinion of the meeting (composed of some of the most prominent sugar merchants of this city), the country is seriously threatened with the total ruin of its sugar industry. It was therefore resolved

“to organize an association for the purpose of defending the important interests now in jeopardy,” and I observe that one of the articles of the programme of this association favors the policy of negotiating commercial treaties with sugar-consuming countries, and “especially a treaty of reciprocity with the United States for the purpose of increasing the consumption of Brazilian sugar among its population, since the Republic is in a position to become the principal sugar market of the world.”

“Brazil at present exports annually from 200,000 to 300,000 tons of sugar, corresponding to about one-fourth of the quantity consumed in the United States. It preserves vast tracts of land admirably adapted to cane culture, so that with remunerative prices and an adequate supply of labor, it could easily furnish all the sugar needed for our consumption beyond what is produced on our own soil, as it already supplies us with the greater part of the coffee which we consume. And, although the balance of trade is now largely against us, and the consumption of Brazilian sugar would greatly augment the amount of our importation from Brazil, there can be no doubt of our ability to ship to this country merchandise at least equal in value to that which we would receive therefrom, if the Brazilian Government, to save its sugar industry from ruin, should admit our products on terms that will enable us to undersell our European competitors. This we hope to do finally in every case, but a commercial treaty, properly framed, would permit us to accomplish immediately that which must otherwise be the result of many years of toilsome and unremitting labor.”



It is a common complaint that the farm and farm life are not appreciated by our people. We long for the more elegant pursuits, or the ways and fashions of the town. But the farmer has the most sane and natural occupation, and ought to find life sweeter, if less highly seasoned, than any other. He alone, strictly speaking, has a home. How can a man take root and live without land? He writes his history upon his field. How many ties and resources he has; his friendships with his cattle, his team, his dog, his trees; the satisfaction in his growing crops, in his improved fields; his intimacy with nature, with bird and beast, and with the quickening elemental forces. Cling to the farm; make much of it; bestow your heart, your brain upon it, so that it shall savor of you and radiate your virtues after your day's work is done.



At the Rio Grande, New Jersey works, in 1887, 1,444 pounds of sugar, and 105 gallons of molasses were obtained on a single acre of sorghum, by a farmer in that vicinity. And yet the officials at Washington, are confident that sugar cannot be made profitably from sorghum.

MUSH AND MILK.

Oh, the flavor, sweet and rare,
 Of the simple farmer fare—
 Mush and milk the wholesome diet
 Of the life so pure and quiet.

Clear the realm of table show!
 Get thee hence, Delmonico!
 Out, ye modern viands flat,
 A la this and a la that.

Give me now a table bright
 With its bowls so clean and white,
 Glittering spoons in hands so manful,
 Milk so luscious, by the panful.

Oh, the fields of golden maize!
 Oh, the halcyon Autumn days!
 Nibblers pale in rustling silk,
 What know ye of mush and milk?

Once again in foreign lands,
 O'er my bowl I clasp my hands,
 Giving thanks that, as of yore,
 Mush and milk I taste once more.

Oh, the rosy cheeks it gave!
 Oh, the arms so strong and brave!
 Mush and milk has raised the latest
 Of the nations, and the greatest.

—*Brooklyn Standard-Union.*

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PROFITABLE FRUIT GROWING.—Mr. F. H. Ball, proprietor of the Ball vineyard, of Fresno Cal., was interviewed briefly yesterday as he was starting on a trip to the East, in regard to the success of the fruit growing business the past season, and a few figures were obtained from him which are not calculated to diminish faith in the productiveness of our soil. The past year was Mr. Ball's first experience in farming in California, and he does not seem to be at all discouraged by the result of his summer's work. The fruit was all sold to George W. Meade & Co., the peaches and pears as they came from the trees and the raisins in the sweat-boxes. From ten acres of peaches he received \$2,522.60; from three and one-half acres of young pear trees, \$101.05, and from fifty-five acres of raisin vineyard of three-year-old vines, \$8,700; a total of \$11,323.65. The net returns are something over \$8,000, a neat sum to lay away for one season's work on a modest investment of capital.—*Fresno Republican.*