

THE

PLANTERS' MONTHLY,

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PLANTERS' LABOR AND SUPPLY COMPANY.

INCORPORATED MARCH, 1882.

OFFICE—HONOLULU, HAWAIIAN ISLANDS.

ANNUAL MEETING IN OCTOBER OF EACH YEAR.

OFFICERS ELECTED OCTOBER 12, 1885.

S. B. DOLE..... President	L. A. THURSTON..... Secretary
H. P. BALDWIN..... Vice-President	J. B. ATHERTON..... Auditor
P. C. JONES..... Treasurer	

TRUSTEES ELECTED OCTOBER 12, 1885.

DOLE, S. B.	BALDWIN, H. P.	ROWELL, W. E.	WILCOX, G. N.
HALSTEAD, R.	GLADE, H. F.	MACFIE, R. A.	ATHERTON, J. B.
JONES, P. C.	THURSTON, L. A.	HORNER, W. Y.	HORNER, J. M.
CASTLE, W. R.			

COMMITTEES OF THE PLANTERS' LABOR AND SUPPLY CO.

APPOINTED OCTOBER 13, 1885.

W. H. Bailey,	E. M. Walsh,	LABOR. J. K. Smith,	R. R. Hind,	S. L. Austin.
G. H. Dole,	C. Koelling,	CULTIVATION. A. Lidgate,	W. H. Rickard,	G. N. Wilcox.
James Renton,	C. F. Hart,	MACHINERY. T. H. Davies,	W. Y. Horner,	J. Ross.
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R. A. Macfie, Jr.,	J. M. Horner,	TRANSPORTATION. J. N. Wright,	Chas. Notley,	G. H. Dole.
J. M. Lydgate,	Jos. Marsden,	MANUFACTURE OF SUGAR. C. C. Kennedy,	A. Haneberg	A. Dreier.
J. H. Paty	Z. S. Spalding,	LIVE STOCK. A. S. Wilcox,	A Dreier,	B. F. Dillingham.
H. M. Whitney,	E. G. Hitchcock,	FORESTRY. C. R. Bishop,	J. Alexander,	W. H. Purvis.
H. P. Baldwin,	E. C. Bond,	FERTILIZERS AND SEED CANE. E. H. Bailey,	R. Halstead,	A. Fayo.
A. H. Smith,	E. G. Hitchcock,	VARIETIES OF CANE. W. H. Purvis,	G. C. Williams,	G. F. Holmes.
B. F. Dillingham,	W. F. Allen,	STATISTICS. C. S. Kinnersley,	H. W. Mist,	C. M. Cooke,
E. Lycan,	Jonathan Austin,	FRUIT CULTURE. C. Koelling,	W. P. A. Brewer,	E. H. Bailey

EDITORIAL AND GENERAL.

Speaking of the recent advance in prices of sugars the San Francisco *Bulletin* says :

“The advance here was also based on a further improvement across the water on account of the alleged shortage of the Beet crop in Europe. On the very day of the advance here a cable from London says : ‘The market has developed an easier tendency, and yesterday Beet was down to 15s 9d.’ Another element of strength in this market is the fact that the American Refinery finds ready sale for all its product among a few firms, and all other houses are compelled to buy of the California Refinery. This condition of things must continue until the improvements recently inaugurated at the American Refinery have been completed. About the 1st of February the capacity of this refinery will be equal to 54,000 tons per annum, against 18,000 tons as at present. After that local trade will be more evenly divided between the two refineries.”

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The *Sugar Bowl*, of September 19th, contains a column article on the Coleman Cane Planter. It is a report to the Louisiana Planters' Association by Mr. John Dymond, the Vice-president of the association, who had been conducting experiments with the machine on his plantation. Mr. Dymond says, “It opens land for plating excellently well ; it drops canes fairly well ; it covers indifferently well.” Speaking of the plow, he says: “The work surpassed that of any other plow I have ever seen, and is better than what I have been able to do with plow, fluke and shaping plank, and hand hoe, used successively. The plow was severely tested, run into some logs, and was under the strain of four first-class mules and came through without breaking. If the plow be disconnected from the machine, the dropping portion can thus readily be made to carry a ton of cane, which, on the basis of six tons per acre, would plant a row five acres long, without renewing the supply, and, I believe, could be made to do away with about three-fourths of the present manual labor required for the purpose. I think that Mr. Coleman, in his plow, has made a tool of immense value to us, and, further, that the cane, dropped as it now stands, is valuable, but may be improved by him, with his present experience, so that it also shall be one of our chief labor-saving tools.”

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DIFFUSION AS APPLIED TO BAGASSE.

Mr. L. M. Fasnacht, of New Orleans, has invented a process for diffusing bagasse after it leaves the mill. In a communication to the Louisiana Planters Association, which we take from the *Sugar Bowl*, it is thus mentioned :

“Having obtained a patent on a machine for heating ramie and sugarcane, I am convinced that the same will be of great advantage to sugar planters, as it is to extract all saccharine matter left heretofore in the bagasse after it leaves the mill, with a small outlay of money and without

extra hands or power to move or work the same. It is to take and occupy the same space and position as the bagasse carrier; of the same width and length, according to quantity of cane to be worked; the height and size of casing to be proportionate to the mill, so as to contain enough liquid in which to move the bagasse freely and retain whatever saccharine matter is in it, as it is lifted from one section of the defecator into another, until satisfactorily washed."

Full drawings and particulars were exhibited. Full particulars have been written for, and upon receipt will be published in the MONTHLY.

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STATE AND PROSPECTS OF THE SUGAR MARKET.

* The statement on this subject, which is intended to be as full as possible, was crowded out of the last issue. The September MONTHLY contained a statement of the fluctuations in the Manila basis up to Sept. 1st. On Sept. 9th it advanced to 5.60 and on the 14th to 5.70 for 91° test. It stood at this figure until Oct. 14th, when it declined to 5.60. Oct. 21st, declined to 5.51, at which figure it stood at latest advices, Nov. 2nd.

The New York market, Cuba basis, stood on Oct. 24th, 6.125 and 6. on Oct. 31st, for 96° test—market weak, slight demand and few sales.

The English market has shown rapid fluctuations, with a downward tendency, standing on Nov. 2nd at 14s 3d for beets 88 per cent. test. This is thought to be the result of bearing the market by those interested, and also to the fact that refiners are running on very low stocks, being doubtful whether the next turn will be up or down.

The European sugar crop is being further reduced by rains which have occurred after the long drouth and just at the grinding season. The effect has been to decrease the richness of the beets, making them watery, the polarization falling 1½ degrees below the average.

Although the tendency has lately been downward, the tone of the press is hopeful and there does not seem to be cause for discouragement.

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A PROGRESSIVE ENTERPRISE.

Just as we go to press, we find upon our table a neat little pamphlet, entitled: "Preliminary Prospectus. Great Land Colonization Scheme, Island of Oahu, Hawaiian Kingdom. A Property of 115,750 Acres offered for sale to a Joint Stock Company, to be called the Hawaiian Colonization Land and Trust Company, Limited."

Time and space at this hour admits of nothing more than a passing notice. Bound with this volume will be found a copy of the Prospectus referred to, which we think speaks for itself. The enterprise receives the hearty endorsement of many of our leading citizens, and is looked upon with favor by all. There is no doubt that our Islands are capable of supporting a population ten-fold greater than the present number, and if due attention be given to the development of its varied resources, as proposed by the promoters of the Hawaiian Colonization Land

and Trust Company, their future betokens a prosperity which only an increasing population can assure.

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THE LOUISIANA EXPERIMENTAL SUGAR STATION.

The Louisiana Sugar Planters' Association, after a somewhat lengthy agitation on the subject has established a station for the purpose of experimenting in all matters connected with the practical advancement of the sugar industry. The use of a plantation known as the Shultz place, situate a few miles above Carrollton, has been secured, and is under the management of Prof. W. C. Stubbs, lately of the Alabama Experiment Station. The scheme is backed by the leading planters, and the sum of \$10,000 has been subscribed to meet present expenses. This step is one in the right direction and marks a new era in sugar culture in Louisiana. By means of a common experimental station, new methods, appliances, machinery, fertilizers, etc. can be tested with but slight expense to any one planter, and with a greater thoroughness than at a plantation where the hurry and rush and anxiety of planting and grinding necessarily distract the mind of the manager and prevent his giving the careful personal supervision and minute attention which is necessary to secure the best results. It is perhaps too much to expect that a station of this kind can be successfully started or maintained here, but there is one thing that planters can do, even if they can not afford the expense of a well equipped station, and that is to stop spending money on fertilizers hap hazard, and without knowing what ingredient is lacking in the soil. What would be thought of a physician who should without examining his patient and not knowing whether he had softening of the brain, liver complaint or rheumatism, should begin treatment with cod liver oil and after a few days should gravely announce that that was not the proper remedy, and prescribe a quinine diet, succeeded by the whole catalogue until perchance the proper remedy is stumbled over; and yet there are numbers of planters who are doing as bad and worse. Expensive experiments with bone meal, phosphates and other fertilizers are being made, without the first idea as to what ingredient in the soil is lacking or what is needed. What is the use of buying bone meal when you do not know whether bone meal is needed on your soil or not; and again, the fact that bone meal is needed at Lihue is no guide for its use at Kohala, any more than the fact that cod liver oil is good for consumption is a sign that it is good for corns. The use of fertilizers should be encouraged and increased, but unless it is done intelligently it is more than likely to result in loss, with no good result. The elementary principal of fertilizing, is to first *find out what is needed*, and then apply it.

The subject of procuring the services of a practical chemist has for years been discussed by planters, and now that such a man has come to reside here, we trust that planters will avail themselves of the opportunity.

PLANTERS AND THE COMING ELECTION.

The near approach of the election for Representatives again brings forward the question of what is and what should be the degree of interest and action which planters should take in politics. It would seem to go without saying that property owners, in any country, should be the ones of all others to take a part in the making of the laws, which concern their property. It would seem to be an elementary principle that those who have property to protect have the right to protect it. Instead however of recognizing this right, the present administration, by precept and practice, constantly denies it, and by every means in its power is now striving to prevent property owners from having any voice in the coming Legislature. We have recently been treated to the spectacle of the Government organ, in a paroxysm of rage over the fact that at a meeting of planters, especially held to consider their interests, they had the temerity to refer to their political as well as their agricultural interests and to suggest that a commission be appointed to investigate a matter of vital importance not only to planters but to the whole country. The same authority has, until a recent date, constantly reiterated that all opposition to the present administration arose from a small minority of would-be office holders, but now we are told that "the head and heart and soul" of the opposition consist of the planters. If this latter statement is true, and there is no doubt that in an unguarded moment of forgetfulness the *Advertiser* has told the truth, it indicates a most serious situation. It will hardly be claimed, even by the *Advertiser*, that the planters themselves want office, or that they are taking action from pure love of politics. The Government has undertaken no special legislation against planters, but on the contrary has continued to encourage and assist the immigration of laborers, a matter of vital importance to the planters. There must be some explanation of the fact that almost without exception, all planters who are not connected with a "Spreckels" plantation, and many of those who are, are aroused to a necessity of opposing the administration at the coming election. There is an explanation, and an index of the cause is the method of procedure, and the candidates that are put forward by the administration for election to the Legislature.

The candidates that are put forward and openly supported by the administration, are as follows:—

HAWAII.

Hilo : Kaulukou, Sheriff and Assessor ; Pahia, Deputy-Sheriff and Collector.

Hamakua : Kaunamanu, Deputy-Sheriff and Assessor.

Kohala : Z. Kalai, District Judge and Assessor.

North Kona : J. K. Nahale, Tax Assessor.

South Kona : D. H. Nahinu, Deputy-Sheriff and Assessor.

Kau : W. D. Kaacamoku (Thompson), Road Supervisor.

Puna : S. Kekoa, Tax Assessor.

MAUI.

Wailuku : George Richardson, Tax Collector for Wailuku, Chief Road Supervisor and Assessor for Makawao ; Keanu, Assessor for 1884.

Makawao : Kamakele, Tax Collector Makawao.

Hana : Kaai, District Judge.

Lahaina : Aholo, Police Judge of Wailuku, Tax Assessor ; Kia Nahao-lelua, Tax Assessor for Lahaina.

Kaanapali : A. Kaukap, Deputy-Sheriff and Assessor.

Molokai and Lanai : Kupihea, District Judge and Assessor ; Nakaleka, Road Supervisor and Collector.

OAHU.

Ewa : J. P. Kama, District Judge and Assessor.

Waialua : Amara, Deputy-Sheriff, Waialua.

Koolauloa : J. Kauahikaua, Tax Assessor.

Koolaupoko : Kaulia, District Judge and Assessor.

Honolulu : F. H. Hayselden, Secretary Board Health and Assessor ; J. T. Baker, Officer in King's Guard ; Keau, Government Poi Contractor ; Lilikalani, no business, supported by the King.

KAUAI.

Waimea : E. L. Kauai, Tax Assessor and licensed liquor dealer.

Lihue : Kalaeone, Tax Assessor.

Hanalei : Palohao, Road Supervisor and Assessor.

Out of twenty-eight candidates who are being supported by the whole power of the Government, twenty-six are Government office holders, whose living and whose retention in office depends absolutely upon their unqualified support of the Administration. One is a last years' assessor with a lively sense of favors to come, and one is supported by the King because he has not brains enough to perform the duties of any office, or to earn his own living. Reference to the legislative history of the last session shows that there were fourteen members who voted straight with the Administration upon every question of importance without regard to right or principle. Every man of the fourteen were office-holders, and every man of the fourteen is now a candidate for reelection. With twenty-six office-holders out of twenty-eight announced Government candidates, and with the record of the past four years staring them in the face, what hope have property-holders of being represented in the Legislature if the candidates who are supported by the Administration are elected ? Their rights would be equally safe, and the country would be as well served were proxies forwarded to the Administration from each district with instructions to vote as to the holder seemed best, with the advantage of saving the salary and placing the responsibility for measures where it belongs. With such a condition of affairs is it a matter of surprise that almost without exception every person of intelligence in the community who is not pecuniarily interested in sustaining the administration is in open and avowed opposition to it? The planters and the intelli-

gence of the country are in opposition to the administration because it would be a stultification of their honor and of that spirit of independence which is possessed by every free man to do otherwise. They are forced into opposition as the alternative of submitting themselves to a despotism which hesitates at no means to accomplish its ends.

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LETTER FROM DR. J. MOTT SMITH ON DIFFUSION.

Dr. J. Mott Smith who is ever on the watch for matters affecting the planter's interest, sends us the following letter on the subject of diffusion, enclosing the communication from Mr. R. Seig, on the same subject :

LOUISVILLE, KY., Sept. 7th, 1885.

EDITOR PLANTERS' MONTHLY :—Mr. Seig, of New Orleans, has sent me a letter, and a newspaper slip about "Diffusion" which probably will interest your readers. He is an enthusiast on diffusion and was among those who instituted and carried on the experiment in Louisiana several years ago. You are aware probably, that the United States Government will make this fall, on the plantation of Mr. Kenner, in Louisiana, an exhaustive experiment with the diffusion process, showing what may be done with canes, with present apparatus, and pointing where improvements should be made. I regard this experiment as an important one for us cane growers, and one well worthy of being closely observed. I have had invitations both from Prof. Wiley and Mr. Kenner, to go to the plantation, and study the process, being offered every facility to obtain the facts and figures. I hope to arrange my affairs, so as to be able to go. A sort of final,—or rather clinch, to the former good showing of the Fiske Shredder will be made this fall at Gov. Warmoth's plantation. I was visiting a paper mill the other day in this city, which uses wood as the raw material—soft woods, like the willow, cyprus, pine, etc. The split wood, in lengths of 5 feet by an average breadth of 4 to 5 inches were put end on to the cutting machine and were cut with lightening rapidity into slices of $\frac{3}{4}$ of an inch thick ; the knives were set in the side of a six-foot wheel from centre to circumference, and they went through the wood as if it were mere paper. I think as the foreman said, all the machine needs to adapt it for a cane slicer is an arrangement for compressing and holding the canes firmly. In such case, the canes might ride each other or be shoved in, in bunches, or any other irregularity, and the machine would do the cutting without fail. All the slicers I have seen so far require the canes to go in only one deep. There is no sugar machinery in this Exposition. This city is quite a manufactory of agricultural machines, a good display of these is on hand. It is in the use of these machines on the level lands of Louisiana which enables those planters to grow their canes so much cheaper than we can.

I remain yours truly,

J. MOTT SMITH.

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* LETTER FROM R. SEIG TO DR. J. MOTT SMITH ON DIFFUSION.

NEW ORLEANS, LA., Sept. 3rd, 1885.

Hon. J. Mott Smith, Louisville:

DEAR SIR—How strange, the other day I was thinking of you, and now you come to me of your own accord. I am fishing for information

too, about Diffusion applied to sugar-cane, which is now done in Spain, Java, Brazil, and Aska. Have you heard anything about these different places, where the process is used entirely without mills? If so, please let me have your facts.

If your Honolulu friends are after some big bonus, I think the offer of the Mauritius planters would give them a better chance, and some knowledge, useful to themselves too.

From the enclosed slip you will see what it is. I am seriously thinking of taking a part in this contest, if I can find some capitalists, who will furnish the money, not only for this contest, but to form a company for the exploitation of Diffusion patents, the battery and cutting machines, in this country, Cuba and Porto Rico, or the Hawaiian Islands.

I shall write to Mauritius and propose, that those planters form a club, subscribing about \$10,000 to \$15,000 towards the construction and transportation of the necessary machinery, with which they may take two or three of the prizes for themselves.

The whole thing can be combined by cutting the cane and passing it through the mill (a 3-roller) they can get 78 to 79 per cent. juice; by taking this bagasse into the diffusion battery placed beyond the mill, they can take about 82 per cent. juice; and by taking the fresh cane slices over the mill, not through it, and by putting them into the battery, they can get 84 to 85 per cent. juice. Calling these gains, gains of 10 to 15 and 20 per cent., one apparatus used in three different ways, ought to take the prizes corresponding to these gains.

The importance of this demonstration would consist in its showing three distinct methods of extraction, all running in the same line of improvements and each adapting itself to some of the local conditions at different plantations, as to water or fuel.

I think I have the simplest Diffusion apparatus and the most effective cutting machine for cane.

Somebody says that the Mauritius planters only get 7 per cent. sugar from their very fine cane.

I had the pleasure of seeing my short remarks on Farjas & Perrets diffusers in the PLANTERS' MONTHLY, also a letter you had upon subjects connected with sugar making in Louisiana.

The opinion of *our* planters may be reliable, if taken upon such familiar subjects as open kettle evaporation or how to reach the point in a strike-pan, or about a stable full of steam boilers, packing sugar and such things, old and venerable, but as far as diffusion or even double mills are concerned, their judgment is not worth a brass nickel.

There is not a single double-mill in the world by which you could get 10 per cent. more juice than 70 per cent., because even with an extraction of 70 per cent. you get already more organic impurities in proportion, than with an extraction of 60 per cent. With 77 per cent. extraction, you would get some 2 or 3 per cent. organic impurities; these may be *counted* for juice, but are *not sugar*. Our planters have not followed the improvements made in diffusion, and they cannot talk about things of which they have no knowledge. Nevertheless many planters imagine themselves competent to judge such questions or feel called upon to do so.

The beet sugar manufacturers who only get 3c. for their sugar where our planter gets 5c., and who have no heavy machinery to supply them with so much exhaust steam, would consider it a sin to throw any thing away that contained one per cent. of sugar. They do not hesitate to dilute their juices with 60 to 80 per cent. water, and *if it did not pay*, they would certainly *not* do it. Compare this with the astuteness of Louisiana

planters. One of them said, "I get only 52 per cent. juice by my mill, but I get all the sugar in that juice. Diffusion may be a good thing, but the expense would be more than the gain." In his instance the gain would have been about \$60,000 per season, and that on a crop of only 8,000 tons cane. But the \$60,000 would have paid for 15,000 tons coal and he never uses over 750 to 800 tons to make his crop. Is the judgment of such a planter on juice extraction really worth having?

The surprise of it will be great when our planters themselves shall begin to see, how little they knew how bold their assertions and how they wasted their crops, for the mere *fun* of it!

Yours very truly,

R. SEIG.

COMMUNICATIONS.

OBSEVATIONS IN JAMAICA.

BY J. MARSDEN.

Jamaica, the brightest jewel in the British crown, is the richest and largest of the West India Islands, belonging to Great Britain. The Government is administered by a Governor appointed by the British crown, assisted by a legislative council comprised of nominated and elected members, the latter being in the majority. The island of Jamaica is situated in the Carribean Sea, between 17° 43' and 18° 32' N. latitude, and 76° 11' and 78° 20' West longitude. The extreme length is 144 miles, its greatest width, 49 miles, and its least width, 21½ miles. The island is divided into three counties and fourteen parishes, containing an aggregate of 4,193 square miles, being 293 square miles larger than Hawaii. The surface of Jamaica is extremely mountainous, the highest elevation being 7360 feet in the Blue Mountain range, which is situated in the centre of the island, running in an east and west direction. From this range subordinate ridges or spurs run in a northerly direction to the north side. These ridges in turn throw off smaller spurs and ridges which branch off in every direction with considerable regularity and method, covering the surface of the country with a series of ridges with intervening valleys. The climate of Jamaica is very similar to that of Hawaii, from a temperature at sea level of 80° to 86° the thermomiter falls to 45° and 50° at an elevation of 6000 to 7000 feet, with a particularly dry atmosphere which renders the climate of the mountains in Jamaica very agreeable. The island is well watered by numerous rivers and springs, although the western part of the island is very dry, being in that respect similar to these islands. A few of the rivers are navigable for boats, the Black river being navigable for large boats for about twenty-five miles from its mouth.

The principal products of Jamaica are sugar and rum. The exports of which was, in 1883: Sugar, 30,784 tons, of the value of \$1,260,000; of rum the export was 2,008,563 gallons, of the value of \$1,130,000. The next in importance is the production of tropical fruits, the export of

which, in 1884, amounted to the sum of \$1,370,000—the list comprising: Bananas, \$960,000; oranges, 290,000; cocoanuts, \$103,000; pineapples, \$10,550; mangoes, limes, shaddocks, and plantains, \$7,000. Jamaica also produces a great variety of tropical fruits not in commerce, all of which, I believe, would do well in these islands. Among those which were in season during my stay in Jamaica was the akee, a very delicately flavored fruit, eaten cooked. It is made into puddings, also boiled with codfish, when it forms a most appetizing dish. Of the others the nesberry, sour sop, black and white star apple, were the best that I tasted. In the matter of fruits, the Hawaiian Islands compare very poorly with Jamaica. Everywhere I went in Jamaica I saw fruit trees growing in the greatest profusion, and it often occurred to me that the same result could be attained in these islands if the people would devote a little energy in procuring tropical fruit-seeds and planting them in the waste lands. There are many gulches and ravines lying between the cane fields that are producing nothing of value which, if planted with the many varieties of tropical fruits that our soil and climate are capable of producing would be a source of delight and profit to the owners, and make these islands truly a Paradise. Before leaving the subject of fruits, I must here mention that of the pineapples grown in Jamaica. The sugar-loaf pine is a large and handsome fruit, often attaining a weight of 6 to 7 lbs.; it is of good flavor, slightly tart. But the delicate Riply is the king of pineapples—of a light brown color, long and slender body with a beautiful crown, forming a pleasing picture to the eye; it has a most exquisite flavor, and after many years' experience of our Hawaiian pineapples a Riply was an unalloyed pleasure.

Of the vegetables grown in Jamaica, the yam stands pre-eminently first. It is the staple food of the colored people, and the white people use it instead of potatoes. It is a grand vegetable, very prolific, and very like potatoes in flavor, only drier and more mealy. The yam is to the negro what the taro is to the Hawaiian.

Of the other productions of Jamaica one is coffee, of which two distinct classes are produced. The total export is about 84,000 cwt. per annum; of this about 10,000 cwt. is Blue Mountain coffee of the finest quality, consigned almost all to the Liverpool market, where it sells for 20 to 30 cents per pound. The remaining portion is grown by negro settlers, is badly cured, and hence fetches comparatively low prices. Pimento, the allspice of commerce, is exported to the value of \$565,000. Jamaica supplies the world with this article. The pimento tree, which is allied to the myrtle family, grows abundantly at elevations of 1500 to 2500 feet. In Jamaica the pimento grows without cultivation. Dye woods, such as logwood, fustic, and sappan wood are exported to the value of \$500,000 annually. Logwood was introduced from British Honduras in 1715, and since that time it has spread spontaneously over the lowlands. It is never cultivated; but, when it has attained a marketable size, the trees

are cut down and the roots taken up, they being as valuable as the trunk for making dye. Young trees are continually springing up from the seeds dropped from the old trees. Logwood is worth about \$25 per ton in Kingston.

Jamaica is well supplied with public gardens and plantations, there being no less than seven situated in different parts of the island. They are kept up at Government expense, and are under the control of a director-general, assisted by a staff consisting of three first-class superintendents, three second-class superintendents, and a keeper. The expenditure for the years 1882-3 was \$25,000; the income for the same period was \$15,000, arising chiefly from the sale of cocoanuts, cinchona bark, and economic plants. In these gardens almost every economic plant that will grow in a tropical country is to be found; they are propagated by skilled gardeners and distributed to the people at a nominal cost. In this way much encouragement is given to the people to start new industries. Many plantations of cocoa and nutmeg are being started, also cinchona plantations, solely from plants procured from the public gardens. Any person in Jamaica who wishes to plant fruit, timber, and shade trees, or any economic plants, can procure the same at any of the public gardens at a nominal cost (about 2 cents a piece).

During my stay in Jamaica I visited the Botanic Gardens at Castleton, in the parish of St. Mary's, nineteen miles from Kingston. The road to these gardens runs through some lovely scenery across a low depression of the mountains of St. Andrew. On the road I passed through several thriving tobacco plantations; I also saw quite a number of abandoned sugar estates. Many negro families have squatted on these estates, where they are allowed to live in undisturbed possession. The gardens at Castleton are beautifully situated on the banks of the Agua Alta river. These gardens contain a large collection of tropical trees, plants, etc., with large nurseries for their successful propagation and distribution; also experimental grounds for economic plants. Here I saw thousands of young plants of every description growing in bamboo pots ready for distribution. It was at these gardens that I procured the plants donated by Mr. D. Morris, the Director-General, to Mr. Jaeger, a list of which has already been published. The residence of Mr. Morris is at the cinchona plantation, situated in the parish of St. Andrew, twenty-three miles from Kingston, on the southern slopes of the Blue Mountains, 4500 to 6300 feet above sea level. Here there are 150 acres of cinchona under cultivation, also five acres of jalop tea, etc. This plantation also contains nurseries for the propagation and distribution of cinchona plants, and timber and shade trees for high elevations. About \$10,000 worth of cinchona bark is shipped annually from the trees grown on this plantation. The growing of cinchona is an industry worth the earnest attention of the Government and people of the Hawaiian Islands. Cinchona flourishes at elevations of 4500 to 7000 feet, with a mean temperature of 65°. A great deal

of the high lands of the Hawaiian Islands—particularly Hawaii and Maui—are eminently suitable for the growing of cinchona, although quinine is lower at present than it has been for some years; yet the prospects of cinchona-growers are most encouraging, owing to the excessive mortality in the cinchona plantations of Ceylon, which has about two-thirds of the planted cinchona of the world. Cinchona growing in Ceylon soon promises to be a thing of the past, but at present they are sending large quantities of bark to market, procured by uprooting whole plantations, and shipping all of the bark. It is also evident that the export of bark from the native forests of South America is decreasing, largely owing to the wasteful plan adopted by the natives, who cut the trees down to procure the bark. It is to be hoped that before many years cinchona bark may figure in the exports of the Hawaiian Islands. Much credit is due to Mr. W. H. Purvis, who has started a cinchona plantation in the Hamakua district of Hawaii, with the most encouraging prospects as regards the adaptability of the climate and soil to the growing of cinchona. The enterprise of Mr. Purvis is being viewed with much interest by the planters of Hamakua, and his example is likely to be soon followed, and cinchona planted in different parts of Hamakua. The Hawaiian Government could do a great deal to encourage the planting of cinchona by establishing a nursery for propagating and distributing cinchona plants to all who would plant them, and also by giving grants of land to persons desirous of engaging in the cultivation of cinchona. The following extract from Mr. D. Morris's report on Public Gardens and Plantations for 1884 will show what the Government of Jamaica has done to encourage the cultivation of cinchona :

THE EXTENSION OF CINCHONA PLANTING IN PRIVATE HANDS.

The intentions of Sir John Peter Grant in starting these plantations in 1868, and the object of the Imperial Government in encouraging and sanctioning their continuance were, I apprehend, not of a pecuniary character—merely for the return they were likely to yield—but in order to prove that cinchona bark of good quality could be successfully grown in the island, and to encourage and support cinchona cultivation being taken up and carried on by private planters.

Up to the close of the year 1880—that is nearly twelve years after the experimental plantations were started by Government—no attempt whatever was made to grow cinchona on private lands; and it was only by showing conclusively that cinchona planting was practicable, and within the reach of coffee planters and persons with moderate capital that a few people were induced to start the cultivation of cinchona on private lands towards the close of the year 1880. Subsequent to this period Government has made nine grants of land under advantageous circumstances to persons anxious to cultivate cinchona. These lands are of the estimated area of 2,688 acres, and are now being planted up with cinchona under conditions specified in agreements signed by the grantees. The most important of the conditions specified in these agreements are :

“That he, the said grantee, will immediately upon entering into possession, commence to establish the cultivation of cinchona, and that at the end of five years from the date of entering into possession he shall

have cleared and planted efficiently with cinchona a total extent of not less than one-sixth of the quantity of land actually granted to him.

"If any of the conditions herein mentioned be broken, the Government may at any time resume possession of the land without compensation of any kind, and the purchase money will be forfeited. If the conditions be complied with, a patent of the land will be made to the said grantee at the end of five years free of further cost, and the land will be vested in him in fee simple, subject only to the reservation above mentioned in the matter of roads."

In addition to the land above mentioned, there are several acres of forest land attached to coffee plantations which are being planted with cinchona; and I estimate that at the present moment there are about 5000 acres in course of being devoted to the cultivation of cinchona plants in this island.

The whole, or nearly the whole, of the seeds, seedlings, and plants of cinchona which are used on private plantations in this island are obtained from the Government plantations. In fact, at the present time, and indeed for many years to come, private planters must be entirely dependent on the old and well-matured trees on the Government plantations for their supplies of good and trustworthy seeds, as also a large proportion of seedlings and plants to start new clearings.

Most species of cinchona, when established in suitable soils, appear to do well in Jamaica, but evidently the most suitable for the circumstances of the ordinary planter is *cinchona officinalis*, which at elevations above 5000 feet grows and thrives in a thoroughly satisfactory manner.

Sugar cultivation in Jamaica has been declining for many years. In 1805 the export of sugar was 150,000 tons; in 1883 the export had declined to 34,000 tons. This decay is caused, to a certain extent, by the decreased fertility of the soil, owing to the constant cultivation of the one crop (sugar cane). The practice in Jamaica is to grow from six to ten crops of ratoons, which are cultivated as long as they will yield one ton or over of sugar to the acre; when the yield falls below this the fields are thrown out, and allowed to rest for a brief period. Plant-cane will yield from 2 to 4 tons of sugar per acre, but 4 tons is a very exceptional yield. The practice of the planters in Jamaica in taking their seed from thrown-up or exhausted fields has a great deal to do with their poor yields; their canes have, without doubt, greatly deteriorated owing to this foolish practice, which is warmly defended by the planters as the best and most efficient method to pursue. The Government of Jamaica has done a great deal in the introduction of new varieties of sugar-canes, of which the planters take but little advantage. On the sugar estates that I visited I found the cultivation very much behind that of Hawaii. Shallow plowing, and very little care taken in keeping the fields clear of weeds; all work of cleaning after the fields are planted is done with hand-hoes; I did not see a single horse-cultivator or small plow. This method makes the cultivation of their crops an expensive process, and, despite their labor being 250 to 300 per cent. cheaper than labor in the Hawaiian Islands, the cultivation of a crop is relatively much more expensive than the cultivation of a crop in Hawaii. The great cause of the

decadence of the sugar industry in Jamaica is found in their crude and inferior methods of manufacture; they seem to have made little progress during the last fifty years. With some few exceptions, the methods of their grandfathers are the methods of to-day. Of two hundred sugar estates that are being worked in Jamaica, but seven use vacuum pans—all use the old-fashioned open kettles; some few use Wetzel pans, but the majority use nothing but clarifiers, and open kettles to bail their juice. More than half the estates have no centrifugal, but drain their sugar. The crushing mills in use are of an old-fashioned type, and are totally inadequate to even a fair expression of juice. The conclusion I arrived at after an inspection of what is called in Jamaica a model estate (Bushey Park Estate) was that, with the use of improved machinery, such as is used in Hawaii, an increase of fully 50 per cent. in the yield could be obtained. The most surprising thing is, that the planters of Jamaica are almost totally ignorant of the immense improvements that have taken place in sugar manufacture during the last twenty years, and even where some seem to have a faint idea that something ought to be done, a total lack of enterprize on the part of the owners prevents any improvements taking place.

The evils of absentee proprietorship are here apparent. Most of the estates are owned by residents of the United Kingdom, many of whom have never seen their estates, and the consequence is that when an estate ceases to pay a profit it is abandoned, and allowed to grow up into bush. There are hundreds of estates in Jamaica now grown up into bush which have been lying uncultivated for many years, and have, no doubt, to a great extent recovered much of their original fertility. Most of these estates, if equipped with modern appliances, would yield a profit, as labor is both cheap and abundant in Jamaica; and there is one great advantage apart from cheap labor that the Jamaica planter has over the Hawaiian planter—that is the manufacture of rum. The proceeds of the rum crop nearly equals that of the sugar crop. Were it not for the proceeds of the rum, sugar cultivation in Jamaica would have to be abandoned.

The negro of Jamaica is a fair worker, but somewhat uncertain for plantation use, from the fact that he requires one or two days per week to work on his own land (on which he is a good worker); this habit of the negro induced the planters to petition the Government to introduce a number of East India coolies. The Government complied with their request, and at the present time there is 12,000 coolies in Jamaica. Upon inquiry, I found the planters much pleased with them, for they are good workers, and the cost to the planter is about \$50 per head. Their wages are fixed at one shilling per day for men, and ninepence per day for the women; they are indentured for five years, and at the expiration of that period they are entitled to a passage to their own country, or a bounty of £12 for each adult, and half that sum for each child between the ages of 3 and 16. Out of 15,652 East India immigrants introduced into Jamaica, but 3,167 applied for and received return passage. Those that I saw were a fine, healthy set of people, and appeared to be well contented. Nearly as many women as men are brought, and, without doubt, they would prove a good class of immigrants for the Hawaiian Islands. I should very much have liked to have made a more extended tour among the sugar plantations, but my time was taken up with the main object of my mission, *i.e.*, the procuring of mongoose for the Hamakua planters. But one thing I am assured of is, that we have nothing to learn from Jamaica

as regards the manufacture of sugar. In regard to the manufacture of rum we have everything to learn; Jamaica produces the finest rum in the world, and at the present time it is one of their chief exports. I will make a further statement on rum manufacture at a future time.

J. MARSDEN.

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*REDUCING EXPENSES IN SUGAR MILLS—PREVENTING
THE LOSS OF HEAT.*

EDITOR PLANTERS' MONTHLY,—In my last letter upon the waste of heat in steam-boilers, it was seen that the greatest loss is that which escapes up the chimney. The consideration of this waste, and the best means to prevent it, is now occupying the minds of engineers both in Europe and America. Careful and costly experiments have been tried in both countries, and from these experiments it is demonstrated that most of this waste can be prevented, and at a very small cost. The greatest improvement in this direction is found to be in substituting a warm blast in the place of a cold one. It will be easily seen how this economy is effected when we consider the large amount of air (eighteen pounds) needed for the combustion of one pound of coal, and the greater the quantity of air used the greater will be the loss. For instance, if we assume that a pound of carbon contains 14,500 thermal units of heat, and if we take 12 pounds of air for its combustion, then the product of combustion is 13 pounds, which, if multiplied by its specific heat 228 and divided into 14,500, the quotient will be 4699°, which is the resultant temperature. If 18 lbs. air per lb. is used, then 3207° is the temperature; and if 24 lbs. air per lb. of coal, then 2437° is the temperature of the furnace. Engineers finding that it is not economical to use cold air are experimenting with a warm blast. The difficulty that has been met with is the burning out of the grate bar; this difficulty is now overcome, and there is nothing to prevent its practical application.

To obtain information on this subject, a most thorough test has been made at the Pacific Mill at Lawrence, Massachusetts, by Mr. Fred. H. Prentice, under the direction of J. C. Hoadly, the boiler test lasting nine full weeks. The objects of the experiments are stated to be:—1. To ascertain what portion of the heat generated in a furnace escapes through the chimney. 2. To ascertain what portion of escaping gases could, practically be arrested and returned to the furnace in a warm blast by an admissible apparatus. 3. To determine the form and dimensions of such apparatus. 4. To ascertain the cost of running a suction blast to replace the loss in the chimney. 5. To obtain by observation the data for striking a balance of advantages and disadvantages resulting from the use of such apparatus.

In carrying this out, a boiler similar in form, dimensions, and setting to all the fifty boilers of the Pacific mills was tested to ascertain how near to theoretical perfect conditions that boiler could be brought in actual

practice, week by week ; to find out just what proportion of the inevitable loss of heat was suffered at the chimney, and what degree of efficiency was attainable. This done, the test would be repeated with the warm blast apparatus attached to the boiler.

The abstractors for taking out the heat from the escaping gases consisted of two sets of iron lap-welded tubes 2 inches in diameter, 120 in a set. Each pipe was encased in a three-inch tube of light iron.

The air passed in the annular inside the outer casing, the smoke passing through the inner two-inch tubes. Air was admitted from the outside of the boiler-house, and was drawn through the abstractors into the ash-pit, and through the fire by the blower. In another form of abstractor used in the test the air was drawn across the hot pipes several times, and thus made to take up as much heat as possible. Long cast-iron grates were found to soften under the warm blast. Williams' rocking grates, with supports at 15 inches, were found to answer.

I am afraid your space will not permit of me giving a full summary of the results, so I will select only such data as seem most pertinent.

Temperature of air supplied to furnace, Fah. :

Pacific boiler	73.3°
Warm blast No. 1.....	337.7°
Warm blast No. 2.....	334°

Temperature of escaping gases :

Pacific boiler	368.3°
Warm blast No. 1.....	186°
Warm blast No. 2.....	164°

Gases cooled by abstractors :

Pacific boiler.....	0°
Warm blast No. 1	207°
Warm blast No. 2	213°

Air warmed by abstractors :

Pacific boiler.....	0°
Warm blast No. 1.....	303.7°
Warm blast No. 2.....	285°

British thermal units of heat carried off in gases per pound of coal :

Pacific boiler	1576°
Warm blast No. 1.....	860°
Warm blast No. 2.....	661°

Difference of efficiency—pounds gained by warm blast over Pacific boiler cold blast :

Warm blast No. 1.....	9.31
Warm blast No. 2.....	12.56

Ratio of gain to large quantity :

Ratio of gain to smaller quantity :

Warm blast No. 1, per cent. 11.9	Warm blast No. 1.....13.5
Warm blast No. 2..... 12.56	Warm blast No. 2.....18.2

The power consumed in driving the blower is about one per cent. of the whole produced by the boiler. Broadly stated the gain is 10 to 18 per cent. The expense of this apparatus and of the blower, and the power to drive, seem to be small in comparison to that which is gained.

EFFICIENCY OF STEAM BOILERS.

Is there any difference to be obtained in the economy of any of the regular boilers in use ? The English claim that the internally-fired

boilers, such as the Cornish, the Lancashire, and the Galloway boilers, are more economical than the tubular boiler. It is claimed that the combustion is more perfect in flue-boilers, and that they are more accessible for cleaning and repairs, and their life is much longer, besides effecting a saving of 5 to 10 per cent. over the tubular boilers.

For the tubular boiler, it is claimed that you can get much more boiler for the money. For instance, you can get a 75 horse-power tubular boiler for the money that a 50 horse-power flue-boiler would cost, and it is supposed that in this case the tubular boiler would be more economical. But from the evaporative test between these boilers, it is almost always seen that the flue boiler came out ahead of the tubular boiler, besides doing 40 to 50 per cent. above their fair rating, while the tubular is most always below its fair rating.

By some persons it is claimed that the compound boilers are an improvement on all of these. In this system of boilers there are usually two—one Cornish and one tubular boiler; and in the place of one boiler we have two, and if we assume that the extra cost of the setting of this extra boiler is one-third of the cost of the boiler, then the total cost of the plant will be one and one-third more than a single boiler. If better results are obtained from this type of boiler, then the extra cost is not of so much consequence. The compound boiler is a comparative new idea, and its efficiency is not quite as well understood as the other types of boilers that are generally in use.

From an experiment tried between a compound and a tubular boiler, the result of the test was an evaporation of 10.73 pounds of water to one pound of coal in the tubular boiler, and 11.11 in the compound boiler, showing a gain of 3.54 per cent. in favor of the compound.

BOILER DEFECTS.

In the report of the Chief Engineer of the National Insurance Company of England, the following percentage of different boilers is given from a test of about 10,000, and is presumably about the proportion in which the different kinds are used in the United Kingdom: Lancashire 35 per cent., Cornish 26 per cent., plain cylindrical 12 per cent., Galloway 3.75 per cent., locomotive 4.5 per cent., multi-tubular and multi-fluid 2.25 per cent., and others of various constructions.

Internally-fired boilers 82 per cent., externally-fired boilers 18 per cent. The number of explosions from July, 1864, is given as 945, of which 141 were from external corrosion; 47, from internal corrosion; 44, general deterioration; 27, internal grooving, defective staying; 101, weakness of tubes; 50, insufficient staying; 22, weakness of manholes; 17, defective materials and workmanship; 11, general construction, water tubes; 9, weakness of end plates; and 3, lack of safety valves. Over-pressure is credited with 104 explosions; deficiency of water, 123; over-heating through defective flues, 2; fracture at riveted seams from external firing, 71.

THE CARE OF STEAM BOILERS.

That which causes the engineer the most anxiety is the boiler. Everything else can be seen, and its defects easily noticed, and be quickly remedied, but the boilers are hidden from sight, and its defects are not so easily seen, and if some of these defects get started the destruction of the iron goes on with such wonderful rapidity, that it is impossible for anyone to believe it who has not seen its terrible work.

It will be seen from the list above, that one of the greatest troubles is external corrosion, and is usually caused by leaks from the seams, tubes, and rivets and man-hole plates.

Another thing which often attacks a steam boiler is internal pitting and grooving but it is seen that the most accidents occur through over-pressure and deficiency of water, it is also seen that 71 explosions are caused by fracture at rivet seams from external, while there are none from internal firing. Derangements also often result from the practice of emptying boilers under pressure, this practice is now condemned by all the Insurance Companies both in England and America. And they recommend instead that $\frac{1}{4}$ the contents of a boiler should be blown out every Saturday night, but never to empty it except for cleaning and repairs; besides these there are many other reasons which may cause a boiler to deteriorate, all of which must be guarded against by the engineer and remedied if they can not be prevented.

I remain,

AN ENGINEER.

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 PLANTATION NOTES FROM HILO.

EDITOR PLANTERS' MONTHLY,—Waiakea is making preparations for taking off a good-sized crop, on which they will start about the end of the month. They are reconstructing their furnaces, increasing the grate-surface for green trash, and adopting the step-ladder bar. Mr. Kennedy finds that the finely-ground trash from the second mill falls through the ordinary bars in considerable quantity—a difficulty that he thinks the step-ladder bar will entirely obviate. He proposes to burn all the trash direct from the rolls, using more or less water in maceration as ultimate economy may dictate.

Another matter which we may learn from the prior experience of Waiakea in maceration is that of pumping the hot water from the double-effect drum. They find that unless the pump is very carefully regulated to do the exact work steam will enter behind the water, when the pump stops and refuses to start unless the steam be allowed to escape. They find it convenient to retain the connection with the air-pump and leave the valve a little open, so that it may take whatever steam there may be while the small pump takes the hot water.

The Police Court in Hilo was unwontedly busy the last week in October with refusal-to-work and insurrectionary cases from Hakalau. Some thirty-five men quit work and went to Hilo in a body because of the

arrest of one of their number. They were remanded to work, after paying costs of Court. The Board of Immigration Circular is supposed to have been at the bottom of the difficulty, and the attorney for the men boldly asserted in open Court that no Court had jurisdiction in such a matter; that it was a matter for Commissioners, not Courts. He was enlightened as to his mistake.

The Wainaku Mill (Hilo Sugar Company) is enlarging its capacity to a considerable extent in the way of an auxiliary pan, more machines, etc. They are also putting the hydraulic attachment on to the mill which will, no doubt, prove a valuable improvement, and will be watched with interest by their neighbors.

The old Kaiwiki lands, under cultivation a dozen or more years ago, and now being replanted after lying so long in grass, are, on the whole, rather disappointing. They are a long way short of new lands, and it is evident that resting alone will not restore land in the Hilo district—at least to its pristine vigor.

Papaikou mill is in a state of demolition preparatory to a double-effect and maceration. A large, roomy, and substantial building is under process of erection, in which almost every modern convenience will find a place, so that Papaikou bids fair to take its station high up the list of the "finest mills" on the islands. At the same time two lines of flume are extending out in either direction, to take Paukaa and Onomea within their embrace—one, we believe, of mutual satisfaction, and we trust mutual profit.

Hakalau, with double-effect in both mills, is ready for the large crop they very reasonably expect. There is no place in the Hilo district more favorably situated as regards position and quality of land than Hakalau, and we will venture to say there is no place that raises uniformly better cane, or more of it. It is simply astonishing how that land will raise cane year after year without rest or recuperation. Some of it has been in for the last seven or eight years, and still shows a good crop. They have sixty or seventy Japanese, about half of whom prove capable and efficient men, the rest very inferior. They are credited as being the most thoroughly immoral class of people that have come to the country.

Honohina is constructing flumes to connect with Hakalau, where their cane is to be ground for the next two crops. They have some rather rough country to cross, and require some high trestles. This place, once in such bad condition, is being fairly well straightened out under the present management, and promises well for the future.

The Laupahoehoe Sugar Company are giving their mills a thorough overhauling preparatory to a large crop. A maceration mill is to be put in at Kaiwilahilahi, where the bulk of the cane will be ground, and both mills are being fitted up with scales for weighing trash, meters, etc., by means of which they propose to gauge the quality of the work done every

day. They are also putting in iron filter presses, being satisfied that a good press is a means of economy.

The general topic of conversation throughout the district is the Austin, Brewer & Co. lawsuit. Universal sympathy is expressed for the Austins, so long residents of the district, and universal curiosity is aroused as to how the matter will turn out. The weight of opinion seems to be that, though it may prove a benefit to the planters in general in defining the powers of the agent, it will hardly accrue to the advantage of those particularly interested in the case.

A reasonable estimate for the district of Hilo and Hamakua places the coming crop at 30,000 tons.

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TRIPLE VS. DOUBLE EFFECT.

(From the *Gazette*.)

EDITOR GAZETTE:—In your issue of Oct. 20th, I noticed "A Report of Committee on Machinery," addressed to the members of the Planters' Labor & Supply Company.

This report is full of interest, is practical and instructive; it shows the great improvements made in sugar mill machinery, as well as the improved methods of evaporation.

But with due respect to this committee I beg leave to differ with them in regard to the merits of the triple effect.

According to the report there seems to be some difference of opinion in regard to the efficiency of the two systems, the double, and triple effect, or rather the preference is given to the double effect to use their own language "The double effect as an evaporating agent, this apparatus is becoming very popular and seems to be preferred to the triple effect, by most practical sugar boilers."

Now this may be the opinion of the sugar boilers, but I scarcely think it is the opinion of the engineers at least. I am convinced by actual practice, and experiment, that the double effect is no more to be compared with the triple effect than that it is to the open pan, or in other words, I believe the triple effect is as far ahead of the double effect, as the double effect is ahead of the open pan, and what is more I can prove this to be the case, simply by giving you the results of an experiment with the triple effect.

This trial was made for the purpose of ascertaining what gain or advantage it had over the double effect. The trial lasted six full weeks, three with double effect and three with the triple effect. The test was made by weighing the trash used, and comparing with the work done, in each case. And from the data thus obtained we found that the saving effected by the triple effect was 35 per cent. over the best attainable practice of the double effect.

This trial was made with cane from the same field, under the same conditions, and was considered thorough and decisive. It clearly proved that the triple effect is more efficient, more economical and takes less steam and will do more work than the double effect, and is in every way a better evaporating agent. In time this will be proved to the satisfaction of every one, and, it is my opinion that in less than five years it will be found in every mill on the islands.

I think it would be instructive and interesting if those persons who prefer the double effect would give their reasons for it, or say why they

prefer it and if they can prove it more economical and efficient, it is certainly their duty to do so, but I doubt their ability to do this, in fact it is impossible. The only thing to be said in favor of the double effect is that it is a little more easily managed.

The double effect I admit is good, but the triple is very much better, indeed it is the best apparatus ever introduced into the sugar mill.

Yours, etc., GEO. OSBOURNE,
Engineer Kaiwilahilahi Mill, Laupahoehoe, Hawaii.

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DIFFUSION EXPERIMENT POSTPONED.

(From the *Sugar Bowl*.)

U. S. DEPARTMENT OF AGRICULTURE,
Division of Chemistry,
OTTAWA, KANSAS, October 9th, 1885. }

J. Y. Gilmore, Esq., Editor Sugar Bowl:

DEAR SIR—Please announce to the planters of Louisiana, in the columns of your valuable journal, that, on my recommendation, the Commissioner of Agriculture has decided to postpone the experiment in Diffusion until next year.

The reasons which led me to this action will appear valid, although I know that many will be disappointed because the trial is not to be made this season.

Our experiments here have shown that the cells of the battery are not large enough to do the work which they are expected to do. The builders are not to be blamed for this, for the only guide they had was the experience of the beet sugar industry and that is not a fair criterion for cane.

It is best to remodel the cells, in the light of experience here, and have them right before beginning.

A more important reason for the delay, however, is found in the fact that we have tried the process of carbonation here with the most pronounced success. It is true, our appliances were crude—but we built an excellent lime-kiln that furnished an abundance of carbonic acid. We are short, however, on carbonating jars and filter presses. In carbonation, not a drop of the juice is lost, except the little that is in cells in the filter press—a mere nothing, compared with the prodigious loss in skimming by the old method. The carbonated juice is perfectly limpid, and of a beautiful amber color, furnishing a splendid syrup or sugar.

I am convinced that Diffusion and Carbonation are Siamese Twins that can not be separated.

We obtained extraordinary good results in extraction here. Yesterday we cut and diffused 50 tons and got a co-efficient of extraction of over 96 per cent. This is as good as anybody can ask.

I think, therefore, that it is far better for Louisiana that the experiment should go over one year and be done right, than to go on with it imperfectly, as I would have to do this season.

I shall advise the Commissioner to take immediate steps to prepare the apparatus for next year, to join with it as good a carbonation plant as the continent of Europe can afford.

Truly, H. W. WILEY.

MACERATION AT KOHALA.

(from the Gazette.)

The following statement of the experience of the Kohala Sugar Co. with the Maceration Mill adds one more to the list of testimonials in favor of that process.

EDITOR GAZETTE:—To the Kohala plantation machinery have been added a double effect, a two roller mill; rolls thirty inches diameter by sixty inches long, and macerating machinery attached. The furnaces need altering or readjusting, to secure the greatest benefit in the saving of fuel, which will soon be attended to. But the grinding has commenced and proceeded for enough to satisfy the company of the wisdom of the expenditure, though not far enough to show what increase of sugar may be expected, when everything is in regular working order. The following are the results as I am informed to Oct. 1st, viz:

The three and two roll mills were in perfect order and condition, to extract as much of the juice from the cane as it is to be expected by the crushing process, and the work was well done. The canes were not weighed, but the experiment has been fair and accurate as far as it has gone, assuming that the tables and the authorities are correct. s

Canes were ground in the three roll mill yielding 16,500 imperial gallons, of an average density of 9½° Baume, equal to 29,890 pounds pan sugar. The trash from the cane was immediately passed through the two roll mill, *without water*, producing 2,500 gallons of juice, standing 9½° B., equal to 4,647 pounds pan sugar, being an increase of 15.55 per cent from the second grinding which I call *dry* as no water was added for macerating the trash. The second lot was macerated. Canes were ground yielding 33,550 gallons of juice, standing as before 9½° on an average, and equal to 60,776 pounds of pan sugar. The trash was immediately passed through the two roll mill, being wet with hot water on leaving the three roll mill, and 1½ to two minutes elapsing before entering between the rolls of the two roll mill, the yield of the diluted juice was 14,450 gallons, standing at 5½° B., equal to 15,577 pounds pan sugar. To produce this amount of sugar, would require 8,600 gallons of juice at 9½° B. Consequently there were added 5,850 gallons of water, which is to be evaporated—an expense not called for if it had been ground without maceration, The increase upon the 60,776 pounds by maceration and grinding in the two roll mill is 25.63-100 per cent..... 15,577 lbs.
Ground dry it would have been 15.55 per cent..... 9,451 lbs.

Difference 10.08 per cent..... 6,126 lbs.

These results, based upon the stated facts, would make the increase of yield very paying, if it is not attended by a proportionate increase of expense, and I am assured by practical men that it is not, that it is even less expensive, as there is less trash to handle, and when the furnace is in the best condition, that it may go to it immediately from the two roll mill, with-

out the added expense of drying and returning from the trash house to the furnace. Whether maceration will pay, in particular cases, must be left to the judgment and careful calculations of the manager. It will depend upon whether the income from the increased amount of sugar obtained, will more than pay for the additional expenses of manufacture. These will consist chiefly, in cost of fuel to evaporate the water added, and time occupied, and wear of machinery in doing it. To evaporate the 5,850 gallons of water would require 9,700 pounds of coal, or about 18,000 pounds of dry trash, or its equivalent in wood. In this case, there can be no question but that it will pay. In cases where the three-roll mill is so powerful as to extract a large percentage of the juice, it might not pay. In cases where the trash supplies fuel for the whole of the work, it will pay. Each individual case must be determined by itself. But I think it will pay to have the double effect, the two roll mill and macerating machinery, on all the large plantations, yielding fairly well.

The showing here has been better than I anticipated, especially as between dry grinding and maceration, and I hardly expect it will expect it will be kept up to this standard.

The low price of sugar and the high price of labor, threaten disaster to both planter and laborer, as well as other industries, for if the planter is compelled to give up, where shall the laborer find employment; and without some margin of profit, to the planter, or employment for the laborer—whence is to come the necessaries of life for either of them. Hence every improvement that profits the planter, and helps him to live, helps the laborer to the employment without which he cannot live. In like manner though perhaps not as directly, he contributes to the support of the merchant, the mechanic, the carrying trade, and every other industry, and the revenue, and government; and hence it is a public necessity, as well as a private personal duty to avail himself of every honest and honorable means to coin that measure of success, which, in the net-work of society will help others to be successful, and the greater the range of his business, the more it is interwoven with that of others, the more diligent and solicitous should he be to make it a success, for if it be a failure, the more will it involve in distress and disaster. The community of sugar planters here, is small, but their business enters more into the net-work of society, and their failure would prove a more serious disaster to society and the government, than the failure of any other class; hence they should make more effort, and others for them, including the Government, to sustain and render successful their calling. With the hope that this new improvement may be all that it promises to be, and that the account of its working, where tried, may aid in promoting the general prosperity.

I remain most truly yours,

S. N. CASTLE.

N.B.—It may be well to add that I have estimated each imperial gallon, at 91° B., to contain 1.8115 lbs. sugar, and every imperial gallon standing 5½° B., to contain 1.078 lbs. pan sugar. In theory, 1 lb. of good coal will evaporate 6 lbs. of water, and each gallon of water weighs 10 lbs. 1.85 lbs dry trash is equal to 1 lb. of coal. Increase of temperature diminishes density of Baume about 1° to 40° of temperature. Thus, say if Baume stands 10° at 60° Fahrenheit, at 100° F. it would stand 9°, at 140°

F. at 8° B. and so on. These are not exact but sufficiently so for common computations. S. N. C.

P.S.—10th.—This morning brings me the Kohala report, for the past week, of the results of the new machinery. It is as follows—43,600 gallons 9.30° B. yielding 78,100 lbs. pan sugar. Trash run through the 2-roll mill wet with hot water, yielding 18,900 gallons of diluted juice standing about 4.9° and yielding 17,296 lbs. pan sugar=22.1 per cent. *increase.*

Cane yielding 22,450 gallons 9.28°=40,210 lbs. of sugar was ground. The trash was then run through the 2-roll mill, without water and gave 4,050 gallons at 8.92° B.=6,962 lbs. sugar *increase.* 17.314 per cent. or 4.786 per cent. less than the above by maceration. To reduce to the 18,900 diluted juice there was supposed to be added 9,306 gallons of hot water to evaporate which would require 15,512 lbs. of coal costing at $\frac{1}{2}$ c. per lb., \$116.34. The saving by maceration in this case would be 3,761 lbs. of sugar worth at 5c. \$188.05. With the more powerful 3-roll mill at Waiakea or Papaikou grinding drier it is doubtful if the maceration would pay if coal at the high price of this market has to be used. If trash is sufficient then it will pay.

Mr. Chapin says, "The ratoons, we are grinding, are some days pretty hard, other days very fair." As far as I can judge, from the reports, thus far, the increase of juice; from the 2-roll mill and maceration is more than I anticipated. Mr. Chapin says, "I believe when the maceration mills, now under process of construction, are in operation, the owners will be astonished at the good results and their past losses." The prospect now is that the improved machinery will be quite as beneficial as we had reason to expect.

Yours truly, S. N. CASTLE.

A subsequent statement on the same subject is as follows:

I have given some account in the *Gazette* of the 13th inst., of the commencement of the experiment, at Kohala. I will here add the whole in a condensed form to the 22nd inst., when it had really passed beyond the stage of an experiment.

Mr. Chapin, the manager, has carefully reported and this is condensed from his reports:

The temperature at which the density is taken is about 80° F.—a part of the trash was run through the 2 roll mill without the application of water and a part was wet or macerated, and it will be noted, that in the case of Kohala Maceration is the most profitable of the two methods.

Through the 3 roll mill	147,050 galls	9.23°=	262,395 pounds	
" " 2 " "	61,700 " "	5.10°=	61,704 " "	diluted juice
" " 3 " "	101,575 " "	9.28°=	182,421 " "	
" " 2 " "	17,375 " "	9.05°=	30,304 " "	no water

330,700 gal,s 536,824 pounds

Gain by 2 roll mill and maceration.....	23.52 per cent
" " 2 " " without water.....	16.60 " "
" " maceration.....	6.92 " "

This indicates how large a loss Kohala has sustained, but is no true criterion of the loss sustained by the new and more powerful 3 roll mills. Waiakea more properly illustrates these, and the gain is there estimated at 15 or 16 per cent. in maceration, a gain of \$15,000 on a \$100,000 crop.

These improvements are a new pledge to the languishing sugar industry and offer new hopes of its final success notwithstanding low prices and high expenses.

S. N. CASTLE.