

THE
PLANTERS' MONTHLY

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

VOL. XIII.] HONOLULU, FEBRUARY, 1894. [No. 2.

The price of sugar has been advancing in New York during the past month, and was quoted at 3.28 for Centrifugals of 96 test, February 10.

The weather throughout the group has been very stormy and rainy, and the sea at the various landings such as to prevent shipments of sugar. At the date of this writing, it is estimated that over two hundred thousand bags of sugar are awaiting shipment to Honolulu.

A list of the officers and standing committees of the Planters' Labor and Supply Company will be found on page 95. Members of committees are requested to bear in mind the fact of their appointment, and prepare information on the topics assigned to them for the next annual meeting.

The lower house of Congress has passed the new tariff bill, abolishing the duty on both raw and refined sugar. It is doubtful whether this radical tariff measure will pass the Senate without receiving important changes; but whether they will be concurred in by the lower house remains to be seen.

A Meteorological table will be found on the last page of this issue, giving the temperature for every week in the year 1893. The coldest day was January 4, and the warmest September 16. The most striking feature of our climate, however, is the evenness of the temperature throughout the year, the coldest day being 56 degrees, and the warmest 86 degrees, and the average variation between the morning temperature and that of noon rarely exceeding twelve degrees.

We are in the receipt of frequent letters of inquiry from persons residing in almost every country, asking for information regarding land, products and openings for employment. It affords us pleasure at all times to do what we can in answering such inquiries, but those making them should not forget to remit a five or ten cent stamp or enclose a dime to cover cost of postage incurred, especially as some correspondents forget to put the full postage on their own letters, thus compelling the recipient to pay a postal tax in addition to sending the desired information.

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AN AGRICULTURAL STATION FOR HAWAII.

During the late session of the Planters' meeting in this city, the subject of establishing an experimental station here was brought forward and urged with an earnestness which gives strong assurance to the hopes of all interested in it that an effort will be made to secure it without unnecessary delay. The benefits which have resulted from these centers of agricultural research, have been so great in every country where they have been established, as to leave no doubt of their value in the minds of those who have followed the teachings derived from the scientific investigations made.

The idea was advanced at the above meeting, much to the surprise of some, that European chemists alone should be sent for, as being superior in their special calling to those of other countries. We most cheerfully admit their high attainments in chemical investigation and particularly the wonderful work they have done in agricultural science. We all

know that to chemical research is in a large measure due the pre-eminence of European beet sugar culture. But it was not by chemistry alone that this has been achieved, rather by the happy combination of science with practice; the practical beet grower called the chemist in to aid him, and it was by *their mutual efforts* that the beet finally reached its present high quality. Working alone, neither would have attained such success, or at least not until the grower had become a chemist, or, what is more likely, the chemist had become a grower.

And this is the point we would emphasize here. It is an easy matter to secure the services of a chemist who would be able to analyze our soils and fertilizers, but before he could be of value, beyond that of a mere analyzing machine, he must learn the practical and diverse details of our cane culture. How otherwise can he draw an intelligent conclusion; how can he give to each fact its logical meaning, if he must first learn the very rudiments of our practice? And not alone the practice but cane culture in general.

What could be expected even from the most learned doctor of chemistry, if he must at the outset be handicapped by learning such a simple thing as how to plant cane? The true agricultural chemist *must first be a farmer*, he must conduct his experiments and interpret his results in the light of cane field work, the soils, meteorological conditions, practical necessities, economical considerations, etc.

If such a man is to be had in Europe, and we have no doubt but that there is, he would quickly adapt himself to local conditions. But the chances would be stronger that a chemist from Europe would be slow to fit into his position here and would bring with him those habits of extreme pedantism which would be slow of removal and which would clog his honest and intelligent endeavors. And furthermore, unless he were familiar with the English language, and able to converse fluently with all who might seek information from him, and with whom he must necessarily come in frequent contact, it would be a misfortune to engage him where others can be had possessed of the desired requisites.

Rather, then, let us look to the cane producing countries for the right man for Hawaii; seek the chemist whose attain-

ments in pure science are such as to show his experience and chemical ability, and whose association *with cane culture has given him that insight which is all important to the intelligent direction of systematic investigations.*

Some of the best work now being done in the advancement of cane is the work in Java, where an experimental station has long been in existence; again we have the valuable work done in Maurice by the late Leon Biard, in "La Station Agronomique de la Reunion;" by Delteil, whose book is a classic; in Guadeloupe by Boname; in Louisiana by Dr. Stubbs, Prof. Wiley, and the Calumet Plantation. Why, then send to Europe when there are such societies to draw from?

The planters of Hawaii could do no better than to secure such a man as Mr. Hubert Edson of Calumet Plantation, Louisiana, and late of the United States Department of Agriculture. His high scientific and practical attainments are known to all Louisiana and the United States and we have reason to believe that he would accept the position, if tendered to him.

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COTTON CULTIVATION IN HAWAII.

On page 81 of this issue of the *PLANTER*, will be found an interesting communication from a gentleman residing in Boston, who advocates the cultivation of long staple cotton on these islands, and furnishes estimates of cost of producing, cleaning and selling it. In the course of his remarks, he refers incidentally to an effort made some years ago to establish this branch of industry here, which, he supposes, failed from planting by mistake short staple or upland seed, or perhaps from the use of the wrong kind of gins in cleaning.

As the editor of this journal was the prime mover if not the only person engaged in the experiment referred to, of introducing cotton culture as a business, it may be well to put on record here a brief statement of the rise, success and ultimate abandonment of this industry, and to state the causes which led to it.

In the early part of the American civil war (1861), the price of cotton began to advance, owing to the blockade of

the principal ports of the Southern states by the ships of the national government. Sea island or long staple cotton especially, which was then and is still raised almost exclusively on the low islands of Georgia and South Carolina, advanced in price more rapidly than the upland or short staple, which was then as now raised largely in other countries. Seeing an opportunity for engaging in what promised to become a profitable business, I sent to Washington and also to New York, and procured at considerable expense several bags of genuine long-staple cotton seed, guaranteed to be from the best Georgia and South Carolina Sea islands. This seed was distributed without charge as called for by natives and foreigners living throughout the group, under a written contract with me to purchase at four cents per pound all the pure cotton in the seed that they would deliver in good condition in Honolulu. Premiums were also offered to those who would raise and deliver the best and largest quantity during the year. These premiums ranged from five to fifty dollars each, and in one year over \$200 were paid out in premiums alone, as an incentive in this new industry.

A cotton house was erected in this city, twenty-four long-staple cotton gins imported from New York, fitted with treadles, and a baling press provided, to carry on the business in the same manner as it was then and probably still is conducted in Georgia. Both natives and foreigners engaged eagerly in the new enterprise, which was started on each of the six principal islands of the group, the finest plants and the choicest fiber being produced generally on the leeward side of each island, as Kona on Hawaii, Kaupo district on Maui, &c. In one year, over a thousand bags or bundles of cotton in the seed were received at my cotton house in this city from various districts of the group, and the buzzing sound of a dozen treadle gins was heard from morning till dark, the machines being run by both boys and girls, who were paid for their work by the pound of cleaned cotton which each turned out. When the cotton was pressed for shipment, the bales contained on an average only eighty pounds each, as the fiber is liable to be injured on a long voyage, if pressed heavily as the short staple cotton is pressed.

Shipments of my cotton were made to Liverpool, Boston and New York, but the American market always proved the most remunerative, owing to the high premium on gold during the war. I obtained for my cotton shipped to New York between the years 1863 and 1866, from sixty cents to \$2.25 per pound in currency, the latter having been paid when the premium on gold was highest. After the close of the war, the price receded rapidly to thirty or forty cents per pound, corresponding to the decline in the gold premium.

The quality of our Hawaiian cotton was judged by experts to be superior to any received from the Southern states, in fineness, length and strength. That shipped by me was consumed chiefly by the manufacturers of sewing thread in Massachusetts and Connecticut, as it made the finest and strongest spool thread in the market. In length the staple of our best sea island cotton grown from plants less than a year old measured from two to three inches. When the plants are cut down and a ratoon crop produced, the staple becomes weaker each crop, till finally it is worthless. The cotton growers found it so easy to raise a ratoon crop by cutting off the old trees and allowing the new growth to spring up from the roots, and starting new plants where the old were dead, that many of them resorted to this trick, which ultimately destroyed the cotton business, as it became extremely difficult to keep the good from the poor, and the price obtained was always based on the poorest samples found in the shipment. It was this deterioration in the quality, that led to the abandonment of the business, as it entailed a heavy loss on the last few shipments. And this is why it will never pay to buy from small growers, who care very little about the quality of their fiber.

Had it not been for this deterioration in the quality of our long-staple cotton, the production of it might have continued to this day. A cotton plantation conducted by skillful growers, and renewed every two or three years, by fresh planting and from the best imported seed, will probably pay, and we should like to see such an enterprise started. Twenty cents a pound in New York could probably be obtained now for best hand-ginned long-staple cotton, raised here. The cost of transportation to New York and other charges would have to be deducted from the price named.

PROFITS IN THE BEET SUGAR INDUSTRY.

The profits of the German sugar makers for the last trade year were large. Dividends were paid by the different companies ranging from 10 to 25 per cent. for many; 5 to 8 per cent. for thirteen; in one instance, the Hildesheim refinery, 60 per cent; the Nordstemmen, 40 per cent. But the growers of beets are generally stockholders in refineries and thus share in the profits. Last season, besides getting \$4.60 per ton for beets, they received an average of 15 per cent. dividend on refinery shares.

The German bounty system has stimulated the industry until the production of beet sugar in Germany has risen to 1,300,000 tons. And now, when a similar system is doing equally as great good for the United States, the party in power propose to violate a compact made binding until 1901, and, gradually or otherwise, stab the new industry.

The people know now from experience that cheap sugar is one of the greatest boons ever bestowed by Congress. The producers of the South and the West realize the promise there is for a great beet sugar industry and the utilization of vast areas of idle land. To change the existing sugar policy means the political suicide of the party responsible for the change.—*Am. Grocer.*

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BEET SUGAR.

A writer in the *Demerara Argosy* of Jan. 6 has the following regarding the unhealthiness of European beet sugar. Is it possible that the process of refining beet sugar is carried on in Europe with the use of such drugs as the writer asserts, the use of which are prohibited in England?

“Beet root sugars are of two kinds. The unrefined is termed raw sugar. This class of sugar is consumed by the poor classes in Britain and on the Continent. This sugar is nothing more or less than decomposed vegetable matter, and in appearance and smell more resembles the sweepings of a pig sty than sugar. The other class is the refined beet root sugar, which can only be made by adding large quantities of

sugar of lead to the juice of the beet root; and to get rid to some extent of that terrible poison, the juice is passed through the dung of horses.

“Since the use of these sugars in Britain and on the Continent, we are constantly hearing of deaths from cholera among the classes who consume the raw beet sugar, and from “influenza” among the classes who consume the refined beet sugar. Some of the best medical intelligence in Europe has declared the former not to be cholera, but the result of poison; and the latter is now engaging the serious attention of the medical profession in Britain and on the Continent, and many of them are of opinion that the so called influenza is also the result of poison, and this opinion is supported by some of the cases of influenza being attended with paralysis of the lower portion of the body, and the nerves of the face, causing deafness. Sugar of lead is known to be an accumulative poison, and if the smallest fraction of a grain is taken it remains in the system, and another fraction taken will add to the first and so continue until sufficient is collected in the system, when it takes active form.

“It is strange that, although the laws of Britain prohibit the use of sugar of lead in the manufacture of the home made sugar, and have appointed a staff of paid experts whose duty it is to visit and inspect the working of the refineries, and see the law is carried out, the people of Britain should be the largest consumers of sugar made by their enemies, and of the nature of the manufacture of which they are ignorant.

“It is a remarkable fact that in the United States of America with a population of sixty-five to seventy millions of people, we hear nothing about deaths from cholera and influenza, and that country up to last year consumed nothing but cane sugar.”

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The crop of the Watsonville beet factory for 1893 amounted to 7769 tons of sugar. This sugar was the product of 65,340 tons of beets, averaging about one ton of sugar to every nine tons of beets. The total beet sugar crop of the United States during 1893 was over 24,000 tons, or nearly double what it was in 1892. Could the sugar bounty continue undisturbed for its full term, the quantity of beet sugar produced in the United States would probably amount to nearly if not fully half of the present sugar importation of the United States.

*ANNUAL MEETING OF THE PLANTERS' LABOR
AND SUPPLY COMPANY.*

Agreeably to notice in the local papers, the postponed annual meeting of the Planters' Labor and Supply Company was held in the Chamber of Commerce room in this city. The attendance was smaller than usual, owing to the short notice given, and the fact that most of the country members were unable to attend at this time. The roll call showed that thirty-eight plantations were represented. The meeting was called to order by the President, Wm. G. Irwin.

The Secretary, Hon. W. O. Smith, then read his annual report, which embodies the transactions of the Company since the last annual meeting.

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*TWELFTH ANNUAL REPORT OF THE SECRETARY
PLANTER'S LABOR AND SUPPLY COMPANY.*

Since the last annual meeting of the Planters' Labor and Supply Company the Trustees have held fourteen meetings. These meetings have been well attended and matters brought before them have received full attention.

LABOR.

The various phases of the labor question, as in years past, chiefly occupied the attention of the Trustees. The only supplies of agricultural laborers from abroad for several years past have been from Japan, and while the Japanese have in many respects given satisfaction, the objections to depending upon one class have not diminished; and the attitude of the Japanese authorities upon the subject of giving Japanese subjects in Hawaii the voting franchise has also complicated the question.

The economic, political and social questions involved in the immigration and labor questions, in their bearing upon the present and future conditions of this country, are of great importance. These questions have received serious and careful consideration, as well as the matter of the demand for laborers.

The report of the Committee on Labor and the discussions at the coming meeting will doubtless give additional information upon the subject.

The following statistics will show the number of immigrant laborers who have arrived since October 1st, 1892.

Arrivals of Japanese immigrants at Honolulu, between October 1, 1892, and October 1, 1893:

	Men.	Women.
Twenty-second lot, ex Yamashiro Maru, November 28, 1892.....	784	173
Twenty-third lot, ex Miike Maru, March 6, 1893.....	582	146
Twenty-fourth lot, ex Miike Maru, June 19, 1893.....	1387	342
	<u>2753</u>	<u>661</u>
Arrivals since October 1, 1893:		
Twenty-fifth lot, ex Miike Maru, October 23, 1893.....	1292	314
Total.....	<u>4045</u>	<u>975</u>

DISTRIBUTION OF TWENTY-SECOND LOT.

	Men.	Women.
Hawaiian Commercial and Sugar Co.....	121	28
Olowalu Sugar Co.....	15	3
Hakalau Plantation.....	49	10
Hutchinson Sugar Plantation.....	49	11
Hilo Sugar Co.....	72	16
Kilauea Sugar Co.....	50	11
Ookala Sugar Co.....	33	8
Hawaiian Sugar Co.....	199	46
Pacific Sugar Mill.....	53	11
Waiakea Mill Co.....	25	5
Hamakua Plantation Co.....	20	4
Pepeekeo Sugar Co.....	30	6
H. P. Faye & Co.....	28	6
Meier & Kruse.....	24	4
Humuula Sheep Station.....	2	--
Koloa Sugar Co.....	9	2
Kukaiiau Plantation.....	1	--
Jas. H. Boyd.....	1	1
G. E. Boardman.....	1	1
Two men refunded passage money.....	2	--
	<u>784</u>	<u>173</u>

DISTRIBUTION OF TWENTY-THIRD LOT.

	Men.	Women.
Onomea Sugar Co.....	98	25
Waiakea Mill Co.....	30	8
Pepeekeo Sugar Co.....	75	18
Hamakua Plantation Co.....	15	4
A. S. Wilcox.....	29	7
Pioneer Mill, Lahaina.....	20	5
Koloa Sugar Co.....	5	1
Paauhau Plantation Co.....	25	6
Hakalau Plantation Co.....	50	13
Ookala Sugar Co.....	25	6
Hilo Sugar Co.....	50	13
Hutchinson Sugar Plantation Co.....	60	15
Hawaiian Commercial and Sugar Co.....	50	13
Paia Plantation.....	25	6
Haiku Sugar Co.....	25	6
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	582	146

DISTRIBUTION OF TWENTY-FOURTH LOT.

	Men.	Women.
Hawaiian Commercial and Sugar Company..	194	48
Hawaiian Sugar Co.....	150	38
Kilauea Sugar Co.....	50	12
Hutchinson Sugar Plantation Co.....	25	6
Hilo Sugar Co.....	50	12
Ookala Sugar Co.....	50	12
Paauhau Plantation.....	99	26
Reciprocity Sugar Co.....	24	6
Hakalau Plantation.....	49	12
Onomea Sugar Co.....	98	26
Kekaha Sugar Co.....	19	5
Koloa Sugar Co.....	73	18
Pioneer Mill, Lahaina.....	30	7
A. S. Wilcox.....	20	5
Lihue Plantation.....	24	5
H. P. Faye & Co.....	10	2
Kipahulu Sugar Co.....	22	5
Kohala Sugar Co.....	25	6
Ewa Plantation.....	100	25
R. R. Hind, Hawaii.....	20	6
Dr. J. Wight, Halawa.....	12	3
Honokaa Sugar Co.....	25	6
Pacific Sugar Mill.....	25	6
Waimea Sugar Mill.....	23	3
Waiakea Mill Co.....	69	17
Pepeekeo Sugar Co.....	40	10
Hamakua Plantation Co.....	15	3
Laupahoehoe Sugar Co.....	29	7
Union Mill Co.....	17	5
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	1387	342

DISTRIBUTION OF TWENTY-FIFTH LOT.

	Men.	Women.
Honomu Sugar Co.....	98	25
Makee Sugar Co.....	97	24
Onomea Sugar Co.....	50	13
Paia Plantation.....	40	10
Haiku Sugar Co.....	30	7
Ewa Plantation.....	48	12
Kohala Sugar Co.....	30	7
Waianae Sugar Co.....	25	6
Dr. J. Wight, Halawa.....	15	3
Kahuku Plantation.....	100	25
Heeia Agricultural Co.....	147	37
Honokaa Sugar Co.....	27	7
Pacific Sugar Mill.....	53	13
Koloa Sugar Co.....	75	19
Meier & Kruse.....	39	10
Kukaiua Plantation.....	27	6
Lihue Plantation.....	24	6
H. P. Faye & Co.....	25	6
Pioneer Mill, Lahaina.....	29	6
Humuula Sheep Station.....	2	--
Kekaha Sugar Co.....	15	3
Ookala Sugar Co.....	40	10
Olowalu Sugar Co.....	20	5
Hakalau Plantation.....	146	31
Kilauea Sugar Co.....	1	--
Hawaiian Sugar Co.....	58	14
Hutchinson Sugar Plantation Co.....	29	7
S. H. Davis, Kona.....	1	1
E. G. Hitchcock, Hilo.....	1	1
	1292	314

INSECT PESTS AND PLANT BLIGHTS.

During the past year insect pests and blights of a character heretofore unknown appeared upon plants and trees, and spread so rapidly, and caused such destruction as to arouse serious apprehension.

Fortunately they appeared first in Honolulu, and through the vigorous and efficient action of the Bureau of Agriculture and Forestry were confined to the Island of Oahu. The danger to every form of vegetable life was great, and, after exhausting all available means for the extermination of the pests, correspondence was opened with Professor Koebele, of California, a scientist, who has had large experience in such matters. Finally, the trustees made a proposition to the Government that Professor Koebele be engaged for a period

of three years at a cost not to exceed \$5000 per annum for salary and expenses, to assist the Bureau, of which cost the Government is to bear one-half and the Planters' P. and S. Company one-half. This proposition was accepted, and Prof. Koebele has been engaged. Numerous specimens of the insects and scale have been sent to him for examination, and he has entered energetically into the study of the matter. He has advised the Bureau as to the best plans of action to adopt; has sent large numbers of lady bugs to prey upon the pests, and will shortly arrive here to pursue investigations and to wage war. Much is hoped from this action. Mr. J. Marsden, Commissioner of Agriculture, has rendered valuable service to the country in this department.

POLITICAL AFFAIRS.

The changes in the political affairs of the country, during the past year, have been of deep interest to the trustees.

The Planters' Labor and Supply Company is not a political organization, but the affairs of the Government and the agricultural interests of the country are closely allied, and the planters have very great interest in the maintenance of good and stable government. These matters have received the grave attention of the trustees, and they have endeavored to exercise a conservative and judicious influence in public matters. These public questions cannot fail to receive attention at the annual meeting.

DROUGHTS.

The past season has been one of great trial in certain sections of the islands. The drought has been severe in Hamakua, on the island of Hawaii, and in some other parts; while in the district of Hilo and the south side of Hawaii there has been an abundance of rain. Special attention has been called to the subject of preservation of the forests, as bearing upon the amount of rainfall, and conserving the water supply.

The Hamakua plantations are now seeking the co-operation of the Government in setting apart of a large area of land, running through the district of Hamakua, above the cane belt for the growing and preservation of forest trees.

While attention has often in former years, been called to the importance of the preservation of the forests, it cannot be emphasized too much.

PLANTERS' MONTHLY.

The PLANTERS' MONTHLY has been ably conducted by Mr. H. M. Whitney during the year.

CONCLUSION.

All of these various subjects which are of such great importance to planters indicate more and more, as the years pass, the desirability of interchange of views and co-operation. It was these considerations that led to the formation of the Planters' Association; and the necessity for such mutual assistance and co-operation is being constantly demonstrated.

It is unfortunate that the drought and other conditions have caused the crops to mature so much earlier than usual that harvesting has already begun on many plantations; for this will prevent many planters from attending the annual meeting. In order to avoid a like result in the future it may be well to have the time for holding the annual meeting placed at an earlier date.

Respectfully submitted,

WILLIAM O. SMITH,
Secretary P. L. & S. Co.

Honolulu, October, 1893.

The report was accepted and ordered printed.

Mr. Smith said that owing to his connection with the Government, as a member of the cabinet, he was compelled to tender his resignation as secretary of this company, and hoped that his name would not be used as a nominee. He thought a man could be obtained to do the work of secretary in addition to his regular duties.

Mr. F. Swanzy then read his report as treasurer.

The receipts for the year amounted to.....	\$2,511 07
Expenditures for the year	1,110 95

Showing a balance of..... \$1,400 12

He stated that the Company was liable for one-half the salary of Prof. Koebele, and other new engagements, which necessitated a larger assessment than was made the previous year.

The election of officers being next in order Mr. Smith nominated Mr. Bolte to be secretary in his place. Mr. H. F. Glade was named in place of Mr. J. F. Hackfeld on the board of trustees, as the latter had taken the place of Mr. Glade during the absence of the latter. With these changes the board was re-elected as follows: F. M. Swanzy, J. B. Ather-ton, H. F. Glade, C. Bolte, F. A. Schaefer, A. Young, W. G. Irwin, H. P. Baldwin and J. O. Carter.

The President stated that the Bureau of Information, of which he was president, was not in a prosperous condition. It was an important matter and letters were continually coming from persons desiring to purchase small tracts of land and to settle here. He would suggest that the bureau be taken under the wing of the Planters' Labor and Supply Company, and the secretary be paid a little more, and answer these letters which should be attended to, and all the information given that may be called for.

Mr. Davies thought some of the letters were not worth answering.

Mr. Baldwin thought such a bureau would be very useful to enable the planters to keep in touch with other sugar countries, particularly those of Louisiana and Texas. In the matter of sugar-house statistics and some other things the Louisiana planters were far ahead of us.

Mr. Marsden said he was constantly receiving letters particularly asking the price of land. Information on this subject ought to be collected and sent to the applicants.

Without reaching any conclusion on this matter, its consideration was dropped.

The president referred to the anticipated deficiency in the income of the Company and asked how it should be raised.

Mr. Bolte moved to defer consideration of the question of assessments till after the reading of a communication regarding an experimental station, which he presented and read, as follows:

To the President of the Planters' Labor and Supply Company :

SIR:—The undersigned would again draw the attention of the Planters' Labor and Supply Company to the recommendations made on November 10th last year, by the Committee on Fertilizers, regarding the establishment of an "Experimental Station." It seems that almost all interested in sugar admit the advisability, or even necessity of such a station, but no steps having been taken we would now lay before you the following definite plan, the adoption and carrying out of which, with such modifications as may be found advisable, we most earnestly recommend.

Let a special committee of the Planters' Labor and Supply Company be appointed, with power to act, and let this committee enter into negotiations with parties interested, for the purpose of establishing an "Experiment Station" on about the following lines :

"Try to have all plantations subscribe five cents a ton on last season's crop. Such subscriptions will give about \$8000, and shall be used for defraying the expenses of laboratory, instruments, chemicals, rent, salary, labor, etc., etc. The station and laboratory to be under the supervision of said committee, and thus under the Planters' Labor and Supply Company. Let the chemist work in conjunction with the Government Bureau of Agriculture. Mr. Marsden, commissioner of said bureau, has expressed his willingness to work in conjunction with the chemist. Work at the laboratory, such as analysis of soil, water, etc., shall be done free of charge for all plantations who have subscribed towards the funds as above stated, and these plantations will also be furnished with regular monthly reports about work done, experiments and observations made at station and laboratory. The laboratory may do work for others (not subscribers) upon payment of the usual fees, and money thus earned shall be turned into the funds of the laboratory and station.

Yours truly,

M. S. GRINBAUM & Co., LD.,

C. BOLTE, Vice-President;

W. G. IRWIN & Co., LD.,

C. BREWER & Co., LD.,

H. HACKFELD & Co.,

F. A. SCHAEFER & Co.,

CASTLE & COOKE,

THEO. H. DAVIES & Co.

Honolulu, Oct. 30, 1893.

Mr. W. O. Smith moved that a special committee of three be appointed, to report as early as convenient on both these matters.

Mr. Glade said that this subject of an experimental station was so important that it should not be mixed up with anything else. Such a station would pay the planters many times over. The main thing was to get a good man, and perhaps it would be well to get one direct from Germany, recommended by an experimental station there. The difficulty was that such a man would probably not be able to speak a word of English. It would be better to get a man who had spent a year or two in the United States.

Mr. Baldwin thought Mr. Glade was right. The matter of the experimental station had nothing to do with the Bureau of Information. He thought the answering of letters, etc., could be attended to by the Secretary, who could employ an assistant to do the work.

Mr. Swanzy said that an experimental station would require a large sum, not less than \$8,000 for the laboratory alone, and to meet this expense a larger assessment will be required.

After some further discussion a special committee, consisting of Messrs. Glade, Bolte and Baldwin, was appointed to investigate the matter of an experimental station and report to the trustees.

In reply to an inquiry, the secretary stated that the production of sugar here for the past three years had been 146,000, 122,000 and 152,000 tons.

Mr. Davies, referring again to the expense incurred by supplying information to people living abroad, said that it hardly belonged to sugar planters to pay for giving information about tobacco and coffee. It more properly belonged to them to exchange information with sugar men abroad, as suggested by Mr. Baldwin.

Mr. Schaefer moved that the assessment be $1\frac{1}{2}$ cents per ton, with power to the trustees to increase to two cents, if necessary. Carried.

Mr. Bolte then read the following :

REPORT OF THE COMMITTEE ON LABOR.

To the President of the Planters' Labor and Supply Co., Honolulu :

SIR :—Since the last report of this committee was made to the P. L. & S. Co., there have been the following arrivals and departures of Japanese and Chinese :

	<i>Japanese</i>		<i>Chinese</i>	
	<i>Men.</i>	<i>Women.</i>	<i>Men.</i>	<i>Women.</i>
Arrived, up to and including Miike Maru, Oct. 23, 1893.....	4435	1121	857	115
Left, up to and including Oceanic, Oct. 18, 1893.....	2084	452	1129	67
Excess of arrivals.....	2351	669	48

most of whom may be available as agricultural laborers.

Rates of wages for day laborers have been during the year and are now about the same as they were last year, whilst a modification has been made in the wages of laborers who came under contract from Japan, and also in the charges for bringing these laborers. By these modifications the wages and expenses for such contract laborers have been reduced to about the same sum as that paid for wages alone to day laborers. Day laborers have been offering freely, and your committee have not learned of any difficulty in obtaining laborers during the last twelve months.

The foregoing figures show a large preponderance of Japanese over Chinese. The Japanese laborer is industrious, obedient, intelligent and handy, of cheerful disposition and readily exchanges many of his home habits for the forms of Western civilization; he is, therefore a valuable addition to the Hawaiian population as a laborer and a settler, but as some of our planters prefer having laborers of different nationalities, it might be advisable to encourage immigration of Chinese agricultural laborers to a certain extent.

C. BOLTE,
WM. W. GOODALE,
J. B. ATHERTON,
Committee on Labor.

Honolulu, Oct. 30, 1893.

Reports were called for on Machinery, Legislation, Reciprocity, Transportation, Manufacture, and Live Stock, but no response was given.

Mr. Marsden reported verbally regarding tobacco, that there was nothing new to offer. He had distributed a number of lots of Sumatra seed, and had received from some of the growers samples of the cured tobacco, some of which were badly cured. He had also some patches growing at the Government nursery.

Mr. Glade stated that he had grown some and sent it to San Francisco, where it had been made into cigars, but unfortunately it would not burn.

Mr. Marsden stated that he had some Hawaiian cigars which would burn, with a white ash, as he would prove.

The report of the Committee on Cultivation was then read by the Secretary, in the absence of Mr. Morrison.

Mr. Schaefer objected to adopting the recommendations in the report that the restrictions on Chinese immigration should be removed.

It having been stated that the acceptance of the report, did not carry with it an adoption of everything in it, the motion to accept passed.

Mr. Swanzy then read the report of the Committee on Fertilizers, composed of W. W. Goodale, W. G. Irwin and himself, which warmly endorsed the project of an experimental station, which would be of great benefit not only to cane planters, but to those engaged in other branches of agriculture.

Mr. Schaefer commended the report very highly, and thought it would be productive of much good.

Mr. Glade thought that an experimental station might be started on a small scale, and enlarged as the means were provided.

The president stated that the Hawaiian Government had offered a tract of thirty acres of good soil back of the city and near the Lunalilo Home, for the use of an experimental station.

The meeting adjourned at 12 till 2 p. m., and during the interval, the board of trustees elected the following officers for the current year: W. G. Irwin, President; F. A. Schaefer, Vice-President; C. Bolte, Secretary; F. M. Swanzy, Treasurer; J. O. Carter, Auditor.

AFTERNOON SESSION.

The meeting was called to order at 2:15, with F. A. Schaefer in the chair.

The report of the committee on Ramie was called for and read by Mr. H. M. Whitney, who brought samples of the leaves and cleaned fiber of sanssevieria referred to in the report, the cultivation of which was strongly recommended.

Mr. Marsden, arriving during the reading of the report, brought much larger and finer samples of cleaned sisal and sanssevieria fiber, and spoke in favor of the introduction of both these plants. He stated that he had received orders for

some fifty thousand sisal plants, which he hoped to receive in the course of a few weeks.

A very interesting discussion was engaged in by the members present on the necessity of planters making efforts to introduce this new industry of cultivating fibre plants among the Hawaiians and Portuguese residing near them.

The suggestion made in the report of the Committee on Ramie, that the name should be changed was considered, and that of "Committee on Fibers" was adopted.

On motion, the meeting adjourned *sine die*.

—:o:—

REPORT OF COMMITTEE ON CULTIVATION.

To the President of the Planters' Labor and Supply Company.

SIR:—Your Committee on Cultivation feels a report bearing on this subject must be more or less a repetition of other papers dealing with the same subject, and although it may be said our knowledge is changing in all departments, and old methods of enquiry are giving place to what we call natural order and sequence, yet the range of our investigations in cane culture so far leads to few innovations and to no fundamental change in our practice.

It is not so when we look at the manufacturing department of our business. A few years ago our mills were without the supplementary maceration rolls. Tripple Effects were almost unknown, and a systematic and correct account-keeping of the sugar in the cane disregarded. What we obtained we usually flattered ourselves was higher than what our neighbor realized and our fields were victoriously proclaimed unequalled by any on earth. The weighing-scales and polarimeter have effected a revolution in our mill work, we have a measure of excellence thus established to which our work must continually be compared. Diffusion, as a method of extraction may be said to owe its origin to the fact of a notable loss which we knew about and which we hoped to diminish, if not entirely prevent. But if it expects to be the future system, its detail must undergo great simplification and it will always demand a careful and regular account keeping.

We have no measure, however, for our cane fields, and the natural fertility of the soil is usually the maximum from which,

by successive cropping, we descend to a lower return. Management of the land and cultivation of the crop, consequently, are even of more importance in the long run than methods of manufacture.

In the last year's report Mr. Horner dwelt particularly on plowing, more especially suggesting that very deep tillage was unnecessary and at times disadvantageous. On this point we might add, we consider deep plowing desirable in flat alluvial soils—where the subsoil is generally as good or even better than the surface; but caution is necessary where the surface-soil is shallow, or the sub-soil poor.

A sub-soil, poor in organic matter, turned up in large quantities, may be mixed up with the surface-soil to its detriment. A depth of nine or ten inches in most of our lands is good plowing. It is exceptionally deep soil where more than this is profitably done. Beside the sugar cane is essentially a surface feeder; its roots are soft, fibrous threads running on an average not deeper than from twelve to fifteen inches, but spreading laterally much farther. The depth and width to which roots may extend, however, is variable and is conditional on moisture, permeability of the soil and vigor of the cane, irrespective of the depth of tith. We have seen lands in Hilo and Kau districts producing luxuriant canes without any breaking up of the soil beyond a square hole dug in the ground to receive the seed.

A joint of cane with a fresh or uninjured bud on it placed in damp warm soil will throw out rootlets from the side opposite the bud. Then germination begins and the grass-like leaf shortly appears above ground taking longer or shorter time according to the vigor of growth: The mother joint with its rootlets decays and the plant throws out its permanent roots and may then be said to be on its own resources.

We have all gone through the anxious suspense after planting until germination has become visible above ground. This period varies greatly, old seed comes very slowly and has many chances to run, as to being destroyed by insects or fermentation, while seed from unformed or undeveloped cane is equally objectionable. Cold weather retards a seed's sprouting more than any other thing. When our morning temper-

ature descends to or below sixty degrees F., we may conclude our plant will come disappointingly slow. The best time for planting varies with the locality. We all prefer being through before the cold season sets in, for if replanting or filling in of missed places has to be resorted to, the resulting cane is liable to be undersized or entirely overshadowed by the surrounding vegetation. A field yielding its maximum, presupposes the union of all the factors to growth at the time—good seed (equal in age), the requisite degree of heat and moisture, and good soil.

Some of us are inclined to believe that our climate is changing; that our heats and colds are greater; that there is more unevenness in our rainfall and that destructive droughts are more frequent. This is felt in those districts where cane is raised without irrigation. For the development of cane a good supply of water is required continuously in the soil, and its power of retaining moisture depends upon its physical and chemical properties; thus, in irrigation we often find a portion of a field moist or even quite wet, while a few feet away lies another portion apparently devoid of moisture. The wet piece may be a clay soil or a piece rich in humus, while the neighboring dry portion is usually our permeable, ferruginous clays rich in silica and rather deficient in humus.

A soil bearing cane is too dry if it has less than fifteen per cent. of moisture four inches below the surface and generally a very much larger proportion is indispensable for proper growth. We may say that the degree of growth with strong, rich soils is proportionate to the available moisture furnished to the plant. Cane is preeminently the vegetable of heat and moisture. The soft, fibrous roots without any tap root indicates its requirements in this particular and dryness, extending four or five inches below the surface, arrests the power of functional activity. Intense and prolonged heat rather increases the growing energy of the cane provided it finds enough water in the soil to keep its sap in the circulation.

Shallow or sandy soils are so easily dried down to the place occupied by the roots that enormous quantities of water are necessary to give even a mediocre crop and in spells of continued drought the return may be so poor that it scarcely pays to harvest. The opposite extreme is not possible with

us; since our lands have so much fall, that even in the most retentive clays there is no fear of stagnation from sub-soil water.

It is from these lands that the largest crops are taken in dry seasons while the hopes of planters on lighter soils are blasted by small crops and poor yields. Where lands have lain fallow and a good crop of weeds or grass is plowed under previous to planting, we believe, the drying up of the land is reduced. Weeds, dry grass and cane leaves under the soil, act as retainers of moisture, and are valuable in this respect, as they arrest the evaporation of capillary action, besides furnishing carbonaceous matter for future plant growth.

We sometimes plant the seed too deep and are inclined to cover it too much, but this also must be dependent upon local circumstances such as wind, drought and character of the soil.

The part of the cane chosen for seed may profitably be discussed, but as this subject has recently been very thoroughly discussed in the *PLANTERS' MONTHLY*, we pass it over without remark.

If we plant in rows we may also inquire how far apart they should be and how close together in the row the individual seed should be laid. We consider five feet better than $4\frac{1}{2}$ feet in lands cropped several times, and six feet or more better in deep, fresh soil, while the seed is laid so the ends touch each other. A closer plant than this shuts off the free circulation of air and restricts the expansion of the leaves which are the members of transpiration and transformation. The leaves are in direct relation with the roots and are their complements in the economy of the plant's growth and nutrition. Leaves which have had no room to grow and spread will surely be found on small and imperfect cane, while an abundance of deep green leaves indicate proper plant food, room for growth, and a good stalk.

We make no reference to hoeing the cane, nor to the use of cultivation beyond that it seems self-evident that weeds must be kept down until the cane has taken possession of the field, after which less expense and trouble will be required in this regard; but plowing or cultivating the land below the level of four inches is undesirable after the cane has grown

sufficiently to cover the ground, for the roots are liable to be cut more or less in so doing.

Stripping is general with us and is certainly a good thing provided the leaves have done their duty and become quite dry and detached. On dry soils stripping is not so imperative as in rainy districts. A close plant on rich lands must be stripped to allow light and air to circulate freely.

In the West Indies and other sugar cane regions various opinions for and against stripping have been current, even as far back as when Leonard Wray published his "Practical Sugar Planter" about fifty years ago. All try to do some stripping once or twice but we see no reason to consider, as some do, that a field unstripped is a field uncultivated and will in consequence suffer in yield.

We know of a field on the Hawaiian Sugar Company's lands, which was only partially stripped last year and which yielded nine tons per acre; the distance between the rows, however, was $6\frac{1}{2}$ feet.

This season we have seen a rich field of cane being stripped by ordinary day laborers at a cost of \$18.00 per acre.

If this figure is anything like ordinary prices, and we can vouch for the fact that the laborers were doing their work as well and as fast as is ordinarily done, then it would pay to plant wider and save somewhat in the price of stripping. As we are situated regarding labor it is evident the rise in wages will begin about the time we all require having this work done.

The cost of producing a ton of sugar must come down first in manufacture, and secondly in the field department, and we think there is room for enquiry particularly in the matter of stripping.

A report on cultivation at best is but sketchy and incomplete, but seeing so much of our sugar is raised by irrigation a few sentences should be given to that and also some notice of the application of manures should be taken, although, the latter finds special treatment by a different committee.

Irrigation is either auxiliary to the rains or independent of them. Such plantations as are situated on the windward side of Kauai and in some measure the Makawao District on Maui, have frequently good rains and cane has been raised

on these places without irrigation in former years, and although irrigation is the cause of their prosperity and as such is indispensable, yet the general freshness or moisture in their climate, requires that they be classed differently from the desert places only made fertile and kept so by irrigation. It will be found also that a great difference exists in the character of their soils—principally in humus—in places having some regular rains and those we call desert.

In plowing arid lands we find no continuity in them and whenever the surface is cut or disturbed, the soil loses all cohesion and flies in all directions with the winds. It is not so where there has been enough moisture to keep even a feeble vegetation alive; and so we find the amount of water required for successful cultivation is measured not by how much this or that particular planter puts on an acre, but rather by the locality, slope of ground, exposure to winds and cohesion of the soil.

A field laid out for irrigation has its furrows, where the cane is planted, traced out as nearly level as possible and the water courses at right angles to them about thirty feet apart. It is good work for a Chinaman to thus irrigate from one to one and quarter acres per day, and the quantity of water used per acre will average from 11,000 to 14,000 cubic feet according to the nature of the soil and slope or declivity of the land. This amount put on every eight days during the growth of the plant will in deep soils with a good sub-soil give a luxuriant crop. Irrigation on light soils, deficient of sub-soil and resting on partially disintegrated rock or rounded pebble stones, will make the thin surface soil absolutely sterile in a very short time.

The question of ratoons should be dealt with, but will have to be passed over at present. If we only use plant cane we can crop the same field every second year allowing no resting time, if a short ratoon comes in after the crop then two crops are taken off in three years, and so the bearing average of a field is measured by these periods of time and in this way the capacity of a plantation can be nearly determined by knowing the total acreage.

Planting cane on a proportion of the sugar is not a subject of much importance among us and the little that is being

done is decreasing. Several years ago in different parts of the islands this was encouraged. Where the planter owns or controls the land and works on his own resources we see no reason why profitable business arrangements for both planter and mill owner shouldn't be made. The basis should be so much per ton of cane of a definite quality, such as is being done for the beet farmer wherever beets are cultivated. This would be preferable to a stated proportion of the sugar which is an unbusinesslike transaction, and is often defective according as the mill is up to its duty and run intelligently or not.

Other sugar growing countries are looking forward to the separation of the milling from the planting part of the business and this would be the best procedure provided population were firmly enough established to occupy the lands and so regard their interests as belonging to the country and the soil. It appears to us that we are not within sight of such a revolution, but we might consider a settled political future would materially assist to the developing of conditions favorable to this.

Meanwhile our labor is the question of the most importance to us; not a day should be lost in having the restrictions on abundant Chinese immigration repealed. The present agricultural standing of this country as second to none has been brought about, not by our fine machinery or the quality of our lands, but by the industry of the hated and proscribed Chinaman.

Portuguese are good laborers for our climate, and whatever objection is urged against them in the matter of too expensive quarters, &c., does not apply to the Chinaman.

The Chinese are a hardier race in every way than the Japanese and are less liable to concerted action resulting in strikes and riots; while dangerous drunkenness is unknown among them.

If sugar growing here is to remain a profitable investment and independent of political manipulators, it can be so only when we are in earnest about having labor to do our work at figures commensurable with other sugar growing countries.

While writing the foregoing, our notice was drawn to Mr. Leisse's remarks in the *Hawaiian Gazette* about the price and

abundance of labor in Java, \$4.00 to \$5.00 per month and 1000 on hand after a day's notice!

This is the only way to develop the sugar business to its fullest capacity and at such figures we would be practically independent of the spiteful and hysterical movements of sugar tariffs, or more correctly, of those controlling them. Our present attitude regarding labor is simply suicidal, and furnishes a "trust" interest and benefit to the Japanese by practically laying ourselves open to their dictation.

H. MORRISON,

Chairman Committee on Cultivation.

Hawaiian Sugar Co., October 23, 1893.

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REPORT OF COMMITTEE ON FERTILIZERS.

To the President of the Planters' Labor and Supply Company :

The duty imposed on your committee is one which they find great difficulty in discharging to their satisfaction. They conceive this duty to be not only to record what has been done during the past year on these islands, but to make recommendations for the future guidance of planters.

The record of the past would not be a difficult task were it not that our planters, to all of whom applications for reports were sent, have, with but a few exceptions, failed to reply, from which it may be inferred that the majority either had no report to make, or did not think it worth while to give publicity to their experiments in fertilization.

From the replies which were received the following few facts are gleaned :

At Ewa plantation fertilizers are not yet in use to any extent, but wonderful results have been obtained by the application of a quarter of a ton of nitrate of soda to the acre of such black soil as showed a lack of nitrogen.

Kealia plantation has done best with fertilizers, containing about 15 per cent. phosphoric acid (1-2 soluble), 3½ to 4 per cent. ammonia (organic matter), and 7 to 8 per cent. potash.

Pepeekeo plantation has derived great benefit from the use of fertilizers; bone meal and certain so called "High Grade" fertilizers being the stimulants mostly used.

At Hakalau the "High Grades" are also the favorites. Here the soil is deficient in phosphoric acid and lime, and the manures used are those the constituents of which are easily soluble and supply this deficiency.

At Wainaku the land is also deficient in lime and phosphoric acid, but sufficiently rich in ammonia and potash. Here the high grade has been applied with good results.

In the Hamakua district there has been little benefit derived from the use of fertilizers during the past year, owing to the exceptional drought from which the district has suffered; and in Kohala the planters are, for the most part, indisposed to go to the expense of fertilization, owing to the uncertainty of the necessary rains, but the prevailing impression seems to be that the lands are deficient in lime. In different places on the islands lime, in various forms, is being applied to the lands, but it is the opinion of many that raw bone meal would prove equally beneficial and more lasting in its effects, as it contains about 4 per cent. ammonia in addition to the about 40 per cent. phosphate of lime.

At Hutchinson plantation good results have been obtained from the use of bone meal.

On a few plantations "green dressing" has been attempted with "Cow" peas, but unfortunately the experiments came to naught, as the peas were destroyed by a kind of black fly (or some say by worms) when but a few inches in height.

So much for the record of the past year.

As to the future your committee regrets extremely to be obliged to admit that it is impossible for it to make any recommendations for the guidance of planters, the adoption of which would certainly be attended by good results. It seems to be the fact that planters are to a great extent guided in their selection of manure by those whose business it is to sell fertilizers, although a few have conscientiously endeavored to ascertain in a scientific manner the exact needs of their lands.

Your committee feels that it will be doing a greater service to the interests of the sugar planting community of these islands by urging the establishment of a properly equipped experimental station than by recommending planters to adopt any particular line of experiments on their own account.

It is hardly to our credit that we have so far advanced in

our methods of sugar making without more fully recognizing the great part which science plays in our principal industry, and no further time should be lost before a properly equipped "station" is established, where soils can be analysed and reliable advice as to the fertilization obtained. It would of course not be alone for the purpose of soil analysis that such a station would be brought into existence, but it should also serve as a sort of experimental plantation where sugar canes of different species might be tried, where fertilizers might be tested, and where all the experiments calculated to promote the agricultural welfare of this country could be conducted. Its range of usefulness would be a very wide one if sufficiently capable men could be engaged.

Such men, if thoroughly capable, would render valuable services in the selection of fertilizers suitable for the varying needs of our plantations, and in the giving of sound advice on the many difficult problems which so frequently confront the sugar planter and manufacturer.

The founding of such an experimental station, while of great importance to all those interested in sugar does not concern them alone, and it is desirable that the interest of all agriculturalists be enlisted to assist in promoting this very important project. It might be well for the P. L. & S. Co., with this object, to enlarge its borders so that all agriculturalists might become members for the sake of the benefit such membership would bring them.

This suggested experimental station is no discovery of your committee. By many others, and for several years the establishment of such station has been spoken of as "a long desired want," but our want is still unfilled. Your committee once again urges on the company to take into immediate consideration the establishment of an experimental station, which would surely be of great benefit to these islands in very many ways, not the least of which would be the lightening of the labors of your future committees on fertilizers.

(Signed)

W. G. IRWIN,

(Signed)

F. M. SWANZY.

—:o:—

A thrifty farmer invigorates a neighborhood. A lazy one demoralizes it.—*Field and Farm.*

REPORT OF THE COMMITTEE ON RAMIE.

To the President of the Planters' Labor and Supply Company :

Your committee are again obliged to report that no progress has been made since the last annual meeting in ramie culture in this group, nor in the making of a decorticating machine that will fulfill all the requirements in cleaning this fiber so as to make it a merchantable staple. Reference was made last year to a machine in course of construction in this city by Mr. J. C. White, but as no progress has been made with it, the inference is that some unforeseen obstacles have prevented its completion. This is much to be regretted, as these islands are admirably adapted to ramie culture, and nothing prevents the development of this new branch of industry but the want of a machine to properly clean it.

Mr. Robt. Catton of this city has in his possession a Death's fiber cleaner, which has been operated in a small way on several kinds of fiber with success, and which may serve for cleaning ramie. It may be driven by water, steam or other power, and has the recommendation of being small and compact. He has written to the manufacturers, Messrs. Death & Ellwood, of Leicester, England, regarding the cost and some late improvements in it, with a view of introducing them, should they be wanted by any parties desirous of engaging in the ramie business.

From the last annual report of the Secretary of Agriculture for 1892, issued in Washington, the following remarks are found respecting ramie and sisal, which furnish the latest official information obtainable on fiber culture in the United States. The extracts will be interesting to those who are seeking for such information.

“The study of ramie is still crippled by the as yet unsolved question of processes and machines for its decortication. It can be produced in this country of a quality that shall rival that of India and China; but the tests made by this department of the machines and processes now existing are not flattering, and assurance cannot be given that success is near at hand.

“Better results are apparent in the culture of sisal hemp.

This is a product largely raised in and exported from Yucatan. It is our supply in large degree, for material for cordage and binding twine. It was supposed that sisal could not be raised in this country, but it is fast becoming demonstrated that it can be successfully produced in Southern Florida."

Our attention has been called by Mr. Joseph Marsden, the active and energetic Commissioner of Agriculture for the Hawaiian Islands, to a plant now growing in many gardens of this city, and probably on the other islands of this group. It is commonly known as "Bowstring Hemp," its botanical name being *Sansevieria Guineensis*, specimen of which will be presented with this report. The fiber, when properly cleaned, is said to be worth \$100 a ton in London. It furnishes an article equal if not superior to New Zealand hemp. Its cultivation has been commenced in Florida, and the fiber is much sought for in the United States for making twines, rope, etc. The report of the Secretary of Agriculture, above referred to, contains the following directions regarding the propagation, cultivation and harvesting of this plant.

"For convenience the leaves are cut into sections about four inches long, and inserted into boxes of earth to the depth of about two inches; the soil must be moderately dry, as too much moisture will cause the leaves to rot. The boxes should be placed in a moderately shady place, and in a few weeks time the leaves will put out numerous fibrous roots, which will soon be followed by suckers. The plants can also be propagated by sections of its roots, which grow without difficulty.

"*Sansevieria* requires good rich soil to succeed well, and will, under favorable circumstances, acquire its full growth in about twelve months time; ordinarily, however, it does not acquire its full growth until the second year.

"When once the land is stocked with its growth, it will always, when cut, get a full growth from the roots inside of twelve months, so that it is perfectly safe, after the second year, to count on a full crop every year; the growth each year becoming denser, and in a few years becoming so thick that it would appear to be impossible to cultivate it, which, however, appears to be needless, as when once fully established it takes possession of the soil, entirely eradicating everything

else. It does not appear to exhaust the soil, as it will grow for a number of years in the same place, and continue to make a vigorous growth.

“*Sansevieria* is essentially a tropical plant, but will stand a slight frost. It will grow luxuriantly on the rich lands of the east coast of Florida. It will, after reaching maturity, if not cut, stand without injury for a number of years; the plant at the end of that time affording just as good fiber as the first or second year of its growth. I am satisfied that a plantation would last over ten years without any necessity for renewing it, or for interfering with it in any manner. *Sansevieria* will, after it is well established, afford a crop of five tons per acre, worth upon estimate about \$100 per ton.”

Here, then, we have a fiber plant which readily grows in our soil and climate, and which, after the first planting, requires very little care in its cultivation, and which will grow and furnish annual crops for ten years without renewal. The fiber produced from the plant is said to be equal to the best New Zealand hemp, and always find sale at current rates in the great produce centers of London, New York and San Francisco. We earnestly call the attention of the members of this society to it, and also to an examination of the cleaned fiber accompanying this report. If there be such a favorable opening for this new industry, let those who are willing to engage in it be encouraged in their efforts to give it a fair trial. There are thousands of acres on each of the islands of this group now lying waste, on which this and other fiber plants can be successfully grown; and in the cultivation and cleaning of which many native Hawaiians as well as foreigners can find constant and pleasant employment, in which their children might assist.

Your committee suggest a change in the name of the title assigned to them to “Ramie and other Fibers.”

H. M. WHITNEY, *Chairman.*

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Never treat superiors with servility or inferiors with arrogance. Speak as kindly to a day laborer as to one occupying a high position.—*Good Housekeeping.*

CORRESPONDENCE AND SELECTIONS.

*SMALL INDUSTRIES FOR HAWAII—LONG STAPLE
COTTON AND EXPERIMENTS IN RAISING
IT AT KANEOHE, OAHU.*

The future of the Hawaiian Islands lies not in annexation, with its numerous intricate questions of labor, etc., but in its being able to supply to the markets of America and the world staple articles of her own growth, which she can raise at a profit. Any nation entirely dependent upon one source of income, will, when that source fails, naturally be in financial trouble, and this has been too strongly brought to the minds of all residents or property owners here, by the reduction or stopping of dividends from sugar investments upon the passage of the McKinley Act in the United States. At that time cane was the principal, and one might say, only source of income from abroad. Since that time all interested have turned their attention to finding, if possible, something which will give a good return per acre, and which allows the small holders of land to raise a crop, no matter how small, which in the grand total will make up a staple article for export. The small holding cannot be dependent upon a mill to perfect his crop as at Ewa where fully 50 per cent. of the cost of products is in the work done in the mill, but he must produce some crop which when gathered can with a small per cent. of the total cost be perfected and find a ready sale in the market.

Some have turned their attention to pines, and they promise well, but, while fruits have their place in making up the general prosperity of the country, they are perishable, and the raiser must depend upon the market close at hand, as a long haul means loss. Many are now turning their attention to coffee, and I am one of those who have firm faith that the Hawaiian berry will have its place as a staple article in foreign markets in time, but while coffee has its place in the list, it has like the sisal and coconut, its drawback. Capital is needed while the tree is growing, which in

the case of coffee takes say three years, sisal three to four, and coconut six to eight years. These, when bearing, will swell the volume of export trade, but we should look for a crop which can be raised and perfected at smaller cost, in one season, and one in which any of the people can engage in no matter how small a way, and the aggregate make a grand total worth considering. Or the sugar planter may use his worn-out cane fields, and produce another crop with the same animals and tools with which he works his cane, and take his crop off between seasons. This crop is long staple cotton, which in my case I planted late in December, and began to pick the middle of May, taking as you see only about five months between planting and the harvesting. But before going any further in the detail of the experiment which I made and the report on the commercial value of the fibre raised, I would ask those interested not to be too strongly prejudiced by the attempt made some years ago to raise the staple and which for some reason failed. I am inclined to think that they used upland cotton seed, and as the work of ginning was done by hand do not well see how they could have made much of a success when we consider that they had a long sea haul about the Cape to New York and Boston, or to England. *

As soon as my seed arrived last December (1892), I took a small patch in the old garden back of the plantation house, which as far as I know has been planted and replanted for years, without much new material being added, and had the ground dug over to the depth of say eight inches with a common fork. The patch first planted was about 30x50 feet, and was only protected from the trade wind by a picket fence about five feet high. I planted much closer ($3\frac{1}{2}$ feet) than I should have, when I should have planted five feet. I put my seed about five in a hill, only about ten inches apart, when they should have been eighteen inches, as I afterwards saw from the growth of the plants. I was badly troubled here, as I was with my coffee, which I set out at the foot of the Pali, with the grub, but as soon as I found what was the cause of the destruction of the young plants, I used Paris Green and then began to make headway.

* See Editorial remarks, page 52.

After the plants had thrown out their second or third set of leaves, the louse appeared, but I was able to keep them back with Paris Green, either dusted on to the young plants, or put on with a water pot, using about half pound of Green to fifty gallons of water. When dusting it on, mix the Green with flour, but the wet method is the best, or Hellebore can be used. But here let me say that the grub and louse are both found as enemies to Sea Island cotton wherever grown, and are not a new feature. Mr. W. G. Hinson of John's Island, Charleston, S. C., from whom I got my seed, tells me he has the same trouble. After getting rid of the louse and grub, I had little to do but watch the growth of my plants, the dropping of the flowers, and the ever-increasing bolls. I was on the watch for the boll worm and caterpillar, but did not find them, much to my delight.

In May I picked my first lint and from that on the crop came along. The bushes were so heavy with bolls, that they simply broke down, which would increase the cost of picking, which goes on daily for about five weeks, but the crop would be sure to be much larger. Just before leaving for the States, Mr. J. P. Mendonca kindly sent me a bundle of the lint, which I took home with me and put in into the hands of some reliable cotton merchants in Boston, and they have reported, as the judgment of several Treasurers of large cotton mills here, and of one of the best judges of long staple cotton in the market, that the sample which I brought home is very fine in grade and staple and that it could be placed here at a price from 20 cents to 25 cents per pound, and that, were the fibre sent to Liverpool, a yet higher price might be obtained, and for this reason, the sample shown them was of such a *high order* and *so long* that they were inclined to think that it could and would be more valuable to a silk manufacturer than to a thread or cotton cloth manufacturer, and they were not sure but that a ready market could be found in Japan. I have sent a small sample of what I have here to Liverpool and shall be pleased to give you their answer.

They write me that the best grades of Tabitian cotton command in Liverpool 9d to 9½d and from the very small sample I was able to send them, they should judge it a little

weaker in fibre than the best grade of Tahitian. They do not incline to a Japan market but would look for a sale in France. And again they do not think as a rule it could be mixed with silk to advantage. From the tone of the letter I am inclined to say that the English buyer has not quite as good an opinion as our Boston merchants, and from the character of these here who are personally known to me, I should say that the Liverpool quotations are for an average grade, while the very best may bring the 25 cents quoted by Boston men.

Here then is the result of my experiment. I have found a crop which will mature in say six to seven months from the time of planting. The only work necessary, after picking is the ginning, which might cost say three cents per pound including baling, if taken to a public gin house, or it could be ginned by hand, by the natives in the old fashion way, and our crop is ready for Boston, Liverpool or Japan.

Now for the more practical part of the whole affair: An average crop in Johns Island is from 125 to 250 pounds of lint per acre, and this lint will give us from fifteen to twenty bushels of cotton seed per acre, which is the best fertilizer or food product there is. Oil can be pressed from it of superior quality, and the refuse used as fertilizer or for cattle food. Let me say that we are only able to produce 150 pounds of lint cotton per acre, and this is of a grade below the finish, and say New York pays us 20 cents per pound for same what is the gross result of our work?

150 pounds of lint.....	20 cents	\$30 00
15 bushels seed.....	20 "	3 00
Total at low figure.....		\$33 00

—Gross income, and now to see the other side:

We have labor, which is the most important item. The Chinese and Japanese would make splendid labor for this crop, and yet I would not pass the native by if he would only work. Could they be induced to work, any kuleana could have its patch, and the areas raised would be large in the total.

We have now to consider the question of cost of production. From the best information I can obtain I find that to raise a pound of upland cotton, that is short staple, and which will

grow for say 250 to 600 pounds of lint per acre, for $5\frac{1}{2}$ to $6\frac{1}{2}$ cents on an average yield. Now as our yield is smaller we can safely say for sake of brevity, ten cents will raise, pick, gin, bale, freight and sell a pound of our staple. What remains?

Gross Income.....	\$33 00
Cost of raising and selling.....	15 00

Net returns per acre.....	\$18 00
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This return may appear small to many of us who have been used to a much larger one, but I think that the crop will be better adapted to the smaller holder than to the large grower: better one hundred farms of five to ten acres than five farms of one thousand acres. It will keep the small holders busy for six to eight months in the year, can be raised on land which is only supplied by the natural rainfall, although I do not know enough about the crop to say what would be the result should it be planted and irrigated. In this paper, I do not wish to appear to advise people to go into the growing of long staple cotton extensively, but sincerely hope that I have interested a few who may be induced to grow a little, keeping an account of expenditures and receipts and to find for themselves that the Islands can raise some, if not the finest long staple cotton in the world. Mr. J. P. Mendonca, of Kaneohe, will be able to give information of the patch of about $1\frac{1}{2}$ acres I planted in April, which I sincerely hope has done as well as that grown in the experimental patch.

D. R.

Boston, Mass., January, 1894.

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There is a whole sermon in the fact that the cost for fuel of the new "Washington Mill" at Lawrence, Mass., has been reduced to \$35,000 per annum against \$96,000 spent by the old corporation, before the reorganization of the plant. This saving of \$61,000 per annum would have been equivalent to four per cent. on the capital of the old company. The production of the new company is about the same as that of the old. This is a practical demonstration of what can be done by putting in efficient machinery and appliances properly designed for the work which they are to do, and putting them in charge of a man who knows how to get the best results out of them.—Power.

ORANGE CULTURE.

BY ALBERT H. BENSON, FRUIT EXPERT.

IN NEW SOUTH WALES AGRICULTURAL GAZETTE.

(Continued from Page 17, in January Planter.)

PROPAGATION AND STOCKS.

The orange is either propagated from seed or layers, or by one of the different methods of grafting or by budding the desired variety on to stocks raised for the purpose. Seedling trees take as a rule much longer to come into bearing than worked trees and no reliance can be placed on the seedlings producing the desired variety of fruit. Though no doubt some of the finest, if not the finest, oranges in the Colony are grown on seedling trees, still seedlings are always more irregular and uncertain croppers than worked trees. The seedling orange tree is always easily distinguished from worked trees by its more upright growth and by its being usually very thorny. The question of stocks is one about which there is a great diversity of opinion amongst orange-growers, but the reason that this is so is mainly on account of certain stocks suiting and thriving in certain soils and under certain conditions better than in others. The principal stocks on which the orange is worked are the seedling orange, common lemon, bitter orange (sour stocks of Florida), Tahiti seedling orange and *citrus trifoliata*, but the latter is only used as a dwarfing stock, and is, therefore, not of any great commercial value. The bitter or Seville orange was at one time greatly run on as a stock, but experience has proved that it is not a reliable or desirable stock, at any rate in this Colony. The Tahiti seedling orange is largely used as a stock in California where it is giving satisfaction so far, and a number of young seedlings of this variety that I have seen near Paramatta promise well, but their value as a stock in the Colony has yet to be proved. This brings us down to two stocks, the common lemon and the seedling orange, between which great difference of opinion exists. Having decided on the stock to use, the next thing is to obtain the seed, and this should be carefully removed from the fruit and not allowed to dry completely before planting. The soil of the seed-bed

should be carefully prepared for planting and should be of a free sandy nature, and possess good drainage. The seeds should be sown in spring in drills, but not covered too deep, when, if they are kept, sufficiently moist, they will soon germinate. The young plants must be kept free from weeds, and the soil hoed and watered when necessary, and if the season is a very hot and dry one provision will have to be made for sheltering the young plants from the direct rays of the sun. The seedling plants are allowed to remain in the seed-bed till the following spring, when they are transplanted to the nursery where they are set out in rows about 3 feet apart, and about 6 inches between the plants in the rows. Here they remain till the following February or March, the ground meanwhile being kept well hoed and free from weeds, when if the stocks are strong enough they are budded with the variety of orange desired or they may be left till the following spring and then grafted. The buds or grafts are allowed to make one year's growth in the nursery when the young trees are ready for planting out.

The seedling orange is a much slower grower than the common lemon, and the trees worked on it are usually much smaller than trees of an equal age worked on the common lemon, but it is claimed by those in favor of orange stocks that the fruit produced is superior to that grown on the lemon stock. In this I cannot agree as I have seen and tested oranges growing side by side in one case on orange roots and in the other on lemon roots, that were undistinguishable in any particular, the grafts from which the trees produced having in each case come from the same tree. Where there is a good free subsoil and perfect natural drainage the orange stock is to be preferred, but where there is only a shallow soil with a stiff subsoil, as is usually the case in most of the Cumberland orchards, the common lemon is the best stock to use as it is the quickest grown, is easily worked, and the tree worked on it is usually a constant and early bearer that stands wet soils better than if it had been worked on orange roots. What is as a rule of far greater importance than the question of stocks is that of the scions used, and it is largely owing to carelessness in this respect that the orange trees and fruit of many of our orchards have so greatly deteri-

orated. The careless and pernicious habit of obtaining scions from the first tree that comes to hand without regard to the quality of the fruit or the health and vigor of the tree cannot be too strongly condemned. Scions should never be taken off trees too far removed from the seedling parent stock, for instance, a scion is taken from a seedling tree and worked on to a lemon stock; a scion from the tree thus produced is again worked on to a lemon stock, and so on through several generations, till the habit of the orange becomes more and more like that of the lemon, and the tree by this continuous system of in and in breeding comes into bearing very early, produces a thick-skinned inferior fruit, becomes dwarfed and stunted in its growth, and only produces a small amount per tree after it has been planted a few years, compared to that grown on a healthy, vigorous tree of equal age. In the choice of scions the greatest care should be taken only to use those that have been obtained from strong, healthy, vigorous trees producing an abundance of the finest fruit, and that are not more than two removes from the original seedling stock. If this system of the natural selection and propagation of the finest existing types of oranges was systematically carried out for a few years, instead of propagating rubbish, the quality of our oranges would be greatly improved, no matter whether orange or lemon stocks are used.

LAYING OUT AND PLANTING AN ORCHARD.

In my article on Prune Culture, published in the *Agricultural Gazette*, Vol. III, page 761, I gave a full description of how best to lay out an orchard and will refer intending planters to the remarks I made then, for what is applicable in the case of prunes refers equally as well to oranges or any other fruit. The distance apart at which to plant orange trees varies considerably with soil, variety and locality, but generally speaking planting in squares at 25 feet apart each way is about the best way to lay out an orchard. I am strongly in favor of giving all fruit trees plenty of room so as to allow the roots a free scope, and that the sun and air can have full play on a considerable portion of the surface of the land, thus keeping it sweet and warm, and that there is plenty of room for cultivation. When the trees are planted too closely to-

gether in a comparatively short time they occupy the whole of the ground and completely shade it, thus keeping the ground cold and tending to sour it. Trees planted at 25 feet apart, giving 69 trees to the acre, will, of course, not produce as much per acre for the first few years as trees planted 20 feet apart, giving 108 trees to the acre; but they will become larger trees, last longer, and will eventually produce much more fruit per acre than trees planted closer together. As I mentioned previously, variety and locality should be taken into consideration when determining the distance apart at which to plant, since such varieties as the different kinds of mandarins the Washington navel, Maltese blood, and several other kinds of worked trees are far less vigorous growers than seedlings or the Parramatta, St. Michael, or common navel oranges, and consequently will stand closer planting than these varieties. But in no case is it advisable to plant closer than 20 feet apart each way. Again, strong growing trees when planted in well-drained, sandy, alluvial soils will grow very much larger than the same varieties grown on shallower and poorer land, especially if the latter is deficient in drainage, and in the case of the former soils it is advisable to plant such varieties not nearer than 30 feet apart each way, and when placed at this distance, peaches or other quick-producing trees may be planted between the oranges and removed when required—the land being thus made to bring in a return till the oranges fully occupy it.

In planting out an orchard care should always be taken to obtain strong, healthy, well-grown yearling trees, having a good fibrous root system and free from scale insects, and it will always pay the planter better to give a good price for such trees rather than purchase an inferior class at a lower rate, as the inferior trees are sure to turn out the dearest in the end. In obtaining trees from the nursery always see that as much of the fibrous roots as possible have been taken up with the tree, and that the roots are carefully protected and as little exposed to the air as possible, especially if the weather is dry and windy, as orange and lemon roots dry out very rapidly on exposure to the air. All broken or mutilated roots should be carefully trimmed with a sharp knife, making the cut from the under-side so that when planted the cut

surface shall come in direct contact with the soil, when young roots will start from the cut surface at once. Some time previous to the removal of the trees from the nursery, they should have been carefully topped at a height of 30 inches from the ground, and three or four branches evenly distributed round the stem should be allowed to start, which, in turn, should also be pinched back so as to harden them off before transplanting. If this has been done and the trees are carefully handled there will be no necessity to cut back any more at planting, but the trees should be set out as received from the nursery. If, however, the trees have not been cut back in the nursery they should be shortened to a height of about 30 inches when planted out, but the leaves along the main stem should not be removed. Dull weather is best for planting and the soil should be moderately moist, but not so wet that it will cake round the trees when planting. If, however, the weather is dry and the soil also dry extra care will have to be taken to prevent injury to the roots, and a little water should be poured over the roots in the hole when planting so as to moisten, but not saturate the adjacent soil. In planting the trees many very elaborate instructions are often given as to the best methods of preparing the holes, the depth to which they should be dug and the time they should be allowed to remain open before the trees are planted, but if the land has been properly prepared and has had its sourness removed there is no necessity to do more than to follow the following simple instructions: Never dig the holes deeper than the surrounding land is worked, especially if the subsoil is of a retentive nature, as by doing so you are simply making a basin to hold stagnant water that will eventually kill the tree. Dig the holes large enough to allow the proper spreading of the roots and always place a quantity of top soil well pulverized in the bottom of the hole keeping the centre highest, so that the bottom of the hole when prepared for planting should present somewhat the shape of an inverted saucer. Never set the tree deeper in the orchard than it was planted in nursery and always spread the roots as evenly as possible round the hole, spreading a little fine top soil over them and pressing tightly, so that every root comes into direct contact with the soil. The hole should then be finished

off and the tree staked if necessary, but the stakes should be removed as soon as the tree is well established, as they often cause the tree to grow unsystemetrically if retained too long. Never place any manure in the hole or around the roots when planting. Citrus trees may be transplanted with care during any month of the year, but the best time for extensive planting is during the months of June, July, or the earlier part of August when the tree is in its most dormant condition. If frosts are somewhat prevalent it is advisable to delay the planting as long as possible, but if there is no frost the earlier in season the planting takes place the better, as the trees will have time to become fairly established before the spring growth takes place.

CULTIVATION, TREATMENT, AND PRUNING.

During the first season the cultivation will consist mainly in keeping the land in a good state of tilth and free from weeds, but should a dry spell take place before the trees are fairly established it will be necessary to give them water to prevent their drying out, and a water-cart is generally used for this purpose unless provision is made for irrigation. After watering always chip round the trees as soon as the land will allow it so as to prevent the soil baking. If desirable a crop of corn, peas, or cabbages can be grown between the young trees during the first two seasons after they are planted out, taking care to plant nothing nearer than 6 feet to the trees and also to replace by manure the ingredients extracted from the soil by the crops grown.

In no case should pumpkins or any similar crop be grown between the trees. The pruning of the young trees is very simple and consists in the removal of water sprouts and all other superfluous branches, and allowing the tree to form a compact, symmetrical head which must not, however, be too dense, but still must completely shade the trunk and main branches from sun-burn. The trees should also be carefully kept free of scale insects, using for this purpose the remedies advocated by the Department, the simplest and most efficacious of which is the kerosene emulsion.

The method of cultivation adopted will depend largely on the nature and depth of the soil. If the soil is of a good

depth so that the roots can penetrate into it without fear of encountering stagnant water then the best implements to use are the plough and the cultivator. In ploughs the Deere, Avery, and Oliver are very suitable for all orchard purposes, and the Planet Jr., and Top Notch cultivators are two of the best one and two-horse cultivators respectively for orchard work. The land should be ploughed once or twice during the winter, and the trees chipped or forked round, but during the rest of the year the cultivation is best done by means of cultivators, and for anyone growing any extent of trees the Top Notch two-horse cultivator with weed-cutter attachment is one of the finest orchard implements for friable soils and does more and better work than any one-horse implement.

If, however, the soil is very shallow with an impervious subsoil into which the roots cannot penetrate, they being thus necessarily on or near the surface, great care will have to be taken in cultivating not to injure the root system, and in some soils of this nature I have seen the best results from the use of the hoe and fork instead of employing horse labor for cultivating. The great draw-back to this, of course, is the expense of working, and that in a bad season it is often impossible to keep the weeds in check. The treatment of the trees after the first two years will be very similar to that already described, and the pruning will be confined to keeping the head moderately open, the removal of superfluous branches and the shortening in of straggling or excessive growths. Always remember that the better state the orchard is kept in, the better the trees will thrive and the less chance there will be of loss from insect and fungus pests. The better an orange orchard is looked after the better it will pay, and if it will not pay with proper management, be sure it will not pay in a neglected and untidy state.

MULCHING

Is another operation of great importance, as when properly carried out and attended to there is probably no better treatment to keep the trees healthy and vigorous. Mulching tends to keep the roots cool and to retain moisture in the soil for the use of the tree, as by the addition of organic matter the absorbent properties of the soil are much increased, thus ren-

dering the soil better able to withstand dry weather. Mulching also tends to keep down weeds and prevents the soil from rapidly growing out. The best material for mulching is bush rakings which consists mainly of semi-decomposed leaves and small branches with a greater or less proportion of the top soil added, and when there is plenty available there is no better material either as a mulch or as a manure for orange or lemon culture. If, however, bush rakings cannot be obtained a good substitute is found in old stable-manure, rotting straw, or partially decomposed weeds or other rubbish, or by growing such green crops as the chew-pea or other strong-growing leguminous plants and cutting them when coming into pod and placing them round the trees. Hot stable-manure should never be used as a mulch by itself, as it is apt to injure the trees, but if it is desirable to use it fresh as a manure and mulch combined it should always be mixed with bush rakings or some other similar substance.

(To be Continued.)

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REVIEW OF THE SUGAR MARKET FOR 1893.

(COMPILED FROM WILLETT & GRAY'S CIRCULAR.)

The year opened with Centrifugals at 3 7-16c. and the market tendency in favor of sellers. Seventy thousand bags Cubas were bought during the first week. The Cuba crop at this time was expected to be 900,000 tons. Three and one-half cents was paid for Centrifugals towards the end of January.

By the middle of January 100,000 tons of Cuba crop had been shipped. European markets were above the parity of ours. At the end of February Centrifugals were at 3 $\frac{3}{8}$ c. and Cuba was a free seller, while Europe remained above our parity and a quantity of raw sugars were exported to the United Kingdom in March.

At the end of March it became evident that the Cuba crop had been overestimated and Centrifugals advanced to 3 $\frac{5}{8}$ c., with a decided hardening tendency.

Early in April raw sugar began a somewhat rapid advance all over the world, based upon the reduced production of

Cuba and the beet crops. Considerable purchases for speculation were made in Cuba. Large speculative syndicates in Europe also held control of supplies, and Centrifugals reached 4c. at the end of April and were still below the European markets.

Early in May Centrifugals sold at $4\frac{1}{4}$ c., with a reaction to 4c. and recovery to $4\frac{1}{4}$ c. before the close of the month. The financial crisis began to affect general business and speculators began to hesitate in their upward movement.

At the middle of June speculators had full control of all the raw sugar markets of the world and refiners appeared helpless to stem the rise. Centrifugals touched $4\frac{1}{2}$ c. and had a stronger appearance than ever, although financial conditions were growing steadily worse, and before the end of June were so bad as to break the sugar speculation, and the month closed with a first decline of $\frac{1}{8}$ c. here and a decline in Europe from the top price of 19 shillings for beet sugar.

At the beginning of July refiners went on a hand-to-mouth basis, and this added to the weakness caused by financial conditions, and the whole complexion of the sugar market was changed from this time forward to end of year. Before the end of July a sugar panic set in in Europe, when beet sugar declined to 15 shillings 6 pence, carrying with it our market for Centrifugals to $3\frac{3}{4}$ c.

The financial panic was also at its height at this time, and extreme measures were taken by the banks to check it, but at the close of August Centrifugals had further declined to $3\frac{1}{2}$ c. and beet sugars were at 14 shillings 6 pence. Cuban holders also became demoralized and made some low sales. A prominent Cuban firm failed.

During September an actual scarcity of supplies for immediate use forced the price of Centrifugals up again to $3\frac{7}{8}$ c. and 4c., which condition continued until late in October, when a certain increase of supplies made as sudden a decline in prices to $3\frac{3}{4}$ c.

By the end of November prices had fallen to 3c. for Centrifugals. The decline was accelerated by the fact that the new crops of both beet and cane were estimated to be some 600,000 tons in excess of the last crops, while the consumption had been seriously affected by the financial conditions.

During December prices declined to 2 $\frac{7}{8}$ c. for Centrifugals, and the year closes with an outlook of larger crops, smaller consumption, tariff changes, general business depression and labor troubles, all which are not encouraging features of the situation.

PLANTERS' LABOR AND SUPPLY COMPANY.

INCORPORATED MARCH, 1882.

OFFICE—HONOLULU, HAWAIIAN ISLANDS.

OFFICERS ELECTED NOVEMBER, 1892.

W. G. IRWIN,	- - - - -	<i>President.</i>
F. A. SCHAEFER,	- - - - -	<i>Vice-President.</i>
F. M. SWANZY,	- - - - -	<i>Treasurer.</i>
C. BOLTE,	- - - - -	<i>Secretary.</i>
J. O. CARTER,	- - - - -	<i>Auditor.</i>

TRUSTEES ELECTED NOVEMBER, 1892.

F. M. Swanzy,	C. Bolte,	W. G. Irwin,
J. B. Atherton,	F. A. Schaefer,	H. P. Baldwin,
H. F. Glade,	A. Young,	J. O. Carter.

The following are the Committees appointed by the President for the ensuing year :

- LABOR—H. P. Baldwin, F. M. Swanzy, C. Bolte.
- CULTIVATION—J. A. Scott, W. Blaisdell, W. Y. Horner.
- MACHINERY—A. Young, G. R. Ewart, Jas. Renton.
- LEGISLATION—J. B. Atherton, P. C. Jones, H. F. Glade.
- RECIPROCITY—Z. S. Spalding, C. M. Cooke, F. A. Schaefer.
- TRANSPORTATION—W. W. Goodale, W. J. Lowrie, A. S. Wilcox.
- MANUFACTURE—H. Morrison, G. F. Renton, W. H. G. Arnemann.
- LIVE STOCK—W. C. Weedon, J. M. Horner, B. F. Dillingham.
- FORESTRY—A. Moore, W. M. Giffard, John Hind.
- FERTILIZERS—G. Wilcox, C. C. Kennedy, J. W. Colville.
- TOBACCO—C. S. Kynnersley, Z. S. Spalding, J. Marsden.
- FIBRE PLANTS—J. Marsden, H. M. Whitney, G. N. Wilcox.
- FRUIT CULTURE—M. P. Robinson, E. W. Jordan, W. W. Hall.
- STATISTICS—J. O. Carter, W. R. Castle, J. F. Hackfeld.
- COFFEE AND TEA—C. W. Miller, J. M. Horner, E. W. Barnard.

Meteorological Summary by Weeks for the Year 1893.

[FROM OBSERVATIONS MADE AT OAHU COLLEGE BY PROF. A. B. LYONS.]

WEEK ENDING	Av. Temp. 6 a.m.	Av. Temp. at Noon.	Av. Temp. 9:30 p.m.	Av. Temp. for Week.	Maximum Temp.	Minimum Temp.	Max. Range of Temp.	Min. Range of Temp.	Av. Range of Temp.
January 7.....	67.7	75.1	70.4	70.46	81	58	20	2	11.7
" 14.....	67.4	74.9	71.1	70.49	79	62	17	9	11.2
" 21.....	70.3	75.7	72.0	72.67	79	65	14	4	8.6
" 28.....	66.1	75.4	68.2	69.90	79	58	18	10	14.0
February 4.....	67.3	73.0	68.9	69.73	77	56	19	6	10.6
" 11.....	69.8	76.1	71.1	72.33	81	61	17	7	10.1
" 18.....	67.3	78.6	69.0	71.63	81	62	18	12	15.7
" 25.....	70.0	76.1	71.1	72.40	80	63	17	7	9.7
March 4.....	69.4	75.8	71.8	72.33	78	62	15	6	8.4
" 11.....	70.1	77.9	71.1	73.03	80	63	17	5	8.9
" 18.....	68.9	77.4	70.8	72.37	81	63	18	3	13.3
" 25.....	69.8	79.6	70.4	73.17	82	63	19	8	13.9
April 1.....	68.6	75.1	70.7	71.47	81	64	17	7	12.5
" 8.....	70.6	78.7	71.9	73.73	80	67	12	7	8.9
" 15.....	72.2	79.6	72.0	74.60	81	67	14	6	9.0
" 22.....	71.2	78.1	71.5	73.60	82	65	17	5	10.3
" 29.....	72.3	80.4	72.5	75.07	82	65	16	8	11.0
May 6.....	72.6	80.6	73.6	75.60	83	65	18	7	11.4
" 13.....	72.6	80.2	73.6	75.47	83	66	17	10	13.0
" 20.....	73.0	79.9	73.8	75.57	83	71	11	7	9.9
" 27.....	72.5	78.4	73.4	74.77	81	69	11	8	9.8
June 3.....	72.6	78.0	73.0	74.40	81	69	11	6	9.0
" 10.....	72.9	78.8	73.9	75.20	81	67	14	8	10.1
" 17.....	73.0	80.6	73.9	75.83	84	67	17	8	11.7
" 24.....	73.7	81.1	74.2	76.33	83	68	15	8	10.7
July 1.....	73.0	81.0	75.0	76.33	84	71	12	9	10.4
" 8.....	73.0	81.9	75.0	76.63	84	67	16	8	11.1
" 15.....	73.7	81.8	75.0	76.83	85	72	13	9	10.5
" 22.....	72.6	81.2	75.2	76.33	83	70	13	10	11.5
" 29.....	72.7	82.8	75.1	76.87	85	68	16	8	12.4
August 5.....	72.9	82.1	75.2	76.73	84	69	14	9	11.8
" 12.....	73.0	81.4	75.9	76.13	84	68	14	8	11.9
" 19.....	72.0	82.8	74.0	76.90	86	68	16	9	12.7
" 26.....	74.1	82.3	75.8	77.40	84	71	13	9	10.8
September 2.....	72.9	82.4	75.6	76.97	85	68	16	9	12.3
" 9.....	73.9	81.7	75.7	77.10	85	69	13	9	10.7
" 16.....	72.7	83.5	75.6	77.27	86	69	17	11	14.0
" 23.....	73.0	82.8	74.4	76.73	84	67	17	9	12.6
" 30.....	73.3	81.2	74.9	73.13	83	68	15	7	12.0
October 7.....	73.6	80.8	75.1	76.50	82	69	13	9	9.9
" 14.....	73.3	81.0	75.0	76.43	83	67	15	6	10.3
" 21.....	73.1	81.2	74.8	76.37	83	66	16	8	11.4
" 28.....	71.2	80.8	72.1	74.70	82	64	17	6	12.3
November 4.....	73.4	79.9	74.0	75.77	83	69	13	6	9.6
" 11.....	70.6	78.5	72.1	73.73	81	64	17	8	11.7
" 18.....	69.5	77.7	70.5	72.57	81	64	16	9	13.0
" 25.....	69.9	76.6	70.3	72.27	80	64	15	4	11.3
December 2.....	67.9	78.4	69.9	72.07	81	63	17	9	13.3
" 9.....	68.9	78.1	71.2	72.73	80	63	17	8	12.4
" 16.....	67.7	76.3	68.6	70.87	78	57	18	7	12.0
" 23.....	67.4	78.1	69.4	71.63	79	58	16	7	12.4
" 30.....	68.6	75.5	69.3	71.13	79	64	14	8	10.4
General Averages.	71.2	79.2	72.7	74.34	86	56	20	2	13.3

Warmest day in the year, September 16. Coldest day in the year, January 4.