

THE PLANTERS' MONTHLY,

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OF THE HAWAIIAN ISLANDS.

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PLANTERS' LABOR AND SUPPLY COMPANY.

INCORPORATED MARCH, 1882.

OFFICE—HONOLULU, HAWAIIAN ISLANDS.

ANNUAL MEETING IN OCTOBER OF EACH YEAR.

OFFICERS ELECTED OCTOBER 12, 1885.

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

TRUSTEES ELECTED OCTOBER 12, 1885.

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

COMMITTEES OF THE PLANTERS' LABOR AND SUPPLY CO.

APPOINTED OCTOBER 13, 1885.

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

EDITORIAL AND GENERAL.

Politics are now to the front. The near approach of our biennial elections heightens the interest of this subject.

Both parties are in the field ; the Ministry are working hard to smother the condemnation which their own failures in the administration of government have pronounced, by procuring the election of dependent officials, who shall assist in the necessary legislative whitening process and indemnifying acts. They have put forward twenty-eight candidates, of whom one is a sheriff, three are deputy sheriffs, two are tax assessors, nine are tax collectors, two are police judges, three are district judges, one is an army officer, one is a government schoolmaster, one is a poi contractor and one a kahili bearer, leaving four who do not appear to be connected with the Government. This truly bread and butter brigade modestly ask the voters of the Kingdom for their endorsement, and propose to desert official duties for three or four months for what ? If the last session of the Legislature is any criterion, they desire to be elected that they may attend the free dinners of the Ministry, vote themselves increase of salary, vote, with their eyes shut, for all bills introduced or supported by the Ministry, regardless of their tenor, among which will be acts for increasing taxes, and may be lottery bills, monopoly bank acts, a ten million dollar loan act, and a bill for muzzling the press. Something like this is the programme of the Government party.

The Independents have candidates in all the districts with the avowed objects of purifying the government, diminishing expenses, paying the national debt, and opposing increase of taxation.

It is not easy in this country to forecast the results of an election and we shall not make the attempt. But as we read the signs of the times, the government has lost strength in the District of Honolulu as compared with the time of the election two years ago. If this is so, it is probably significant of loss of strength everywhere.

The Post Office robbery is an instance of Administration carelessness, as the last legislature appropriated \$88,000 for King's guards and guards to government buildings. The neglect of the latter part of the appropriation has made the robbery possible, and the subsequent strict guard over the empty safes atones for nothing.

The dismissal by the Board of Health of Dr. Arning without cause and the interruption of his important investigations into the causes and nature of leprosy, calls for and has received general condemnation. We understand that the reason of the dismissal, was the Doctor's report to the legislature, which was not in accordance with the medical opinions of the President of the Board of Health who desired to dictate the contents of the report, but as Dr. Arning naturally refused to be dictated to by an ignorant layman the Board of Health had no further use for him and are now in search of medical authorities who will do as they are told.

VIGILANCE NECESSARY.

Agricultural experiments require the test of continuance to be applied to them before they can be said to prove their result. Seasons, climate, and soils so differ that the determinations of one year in one locality may be completely upset at another time and place. For example, it would be no very difficult matter to hunt up details of experimental potato planting proving—that it is best to plant whole tubers, and that it is best not to plant whole tubers; that medium sized tubers are best for seed, and that those of a large size are best; that the top ends grow the best crop, and that the bottom ends do the same; that cutting off the blossom is advantageous, and that is not; that it is best to earth up the rows, and that it is best not to do so; that deep planting is good, and that it is bad; and so on. All this should teach the observant planter that a reported experiment has no authority until first it has been tried on his own fields. It is otherwise with such experiments as are being carried out in Europe and elsewhere, where the same crops are being grown year after year upon the same land, with exactly the same treatment, and which experiments have now been systematically chronicled for many years back. The value of these records increase greatly with each and every additional year of experiment. Yet even in studying these carefully noted results the planter must never lose sight of the fact that the temperature, climate, and rainfall, as well as the soil, of Continental and other places are very different to those of this country. The moral of all this is to impress upon the cultivator that personal experiment and a sound judgment are required for successful planting.

There is an impression among the uninitiated that fruit trees when once planted need no further care, except pruning. This has originated doubtless from the practice common in Great Britain, and in America of laying down the orchard to grass, and the trees being grown in the form of tall standards, allowing the cows to graze under and around them. In a tropical climate this does not do. The fact is fruit trees need unremitting care, there being a tendency in many kinds to grow to excessive wood and in others to bear in season and out of season. They should be planted in rows 30 feet apart, and the space between plowed and cross-plowed and the weeds turned under to fertilize the ground; no weeds should be allowed to grow on the space immediately around the tree, which should be kept quite bare to the extent of the area of its roots. At intervals pruning must be done, scale insects must be cleaned off, and fertilizers must be used. Still the occupation is a pleasant one, and there is room for many people in this country to earn a comfortable living by growing fruit.

Potash on grape vines has been tried with great success, especially on light soils. It is said to promote the thrift of the vines, and largely increase the yield of the crop.

The Report of the Committee on Labor read at the annual meeting of the P. L. & S. Co. has been received from the Committee and is published in this number of the MONTHLY.

A correspondent states in the last MONTHLY that Mr. Jno. Wright, of Oookala, had succeeded in plowing in heavy Hilo grass by running a heavy roller over the ground before plowing. Mr. Chas. Notley, of Hamakua, informs us that the same results can be obtained by fastening a piece of $\frac{1}{2}$ to $\frac{3}{4}$ -inch chain to the whiffletree and let it draw on the grass, the chain to be of sufficient length to allow the loose end to touch the point of the plow. Whether Mr. Notley's receipt is good or not can readily be tested by those interested in the question. It certainly has the merit of simplicity and cheapness.

The *Barbadoes Planters' Journal* for November states that the Island has three prominent wants: fuel, water, and some plant to supplement the product of cane. A bill has been passed exempting land covered by trees from taxation, and it is proposed to make it obligatory upon the proprietors of land to plant a certain number of acres of trees proportionate to the size of their property, the object being both to secure fuel and arrest the continued decrease in the rainfall. The *Journal* states that "the condition of our laborers in the country is lamentable in the extreme. They drink the same water in which they bathe and wash their clothes, and that water too, is the surface water of our fields impregnated with all kinds of fertilizing manures. How they preserve their health is marvellous."

Analysis proves that there is about 1lb. of phosphate lime in every 25 gallons or 30 gallons of milk, and it may be estimated that the annual demand made upon the resources of the soil by a cow is equal to nearly 90lb. of bone.

The planting of forest trees is still receiving great attention from the South Australian Government. During last year no fewer than 344,773 trees were planted on different reserves throughout the colony, and of these 250,000 are reported as alive and doing well. Over 423,000 trees were offered to corporate bodies, farmers, and others, and eagerly applied for. The planting of the railway enclosures was also continued during the year, the trees selected for the purpose being sugar gum, red gum, South Australian blue gum, Tasmanian blue gum, remarkable pine, cluster pine, Aleppo pine, tamarisk tree, white cedar, upright cypress, and pepper tree. There are now fully 15,000 trees on the northern railway reserves making satisfactory progress from plantings during the past two years.

REPORT OF COMMITTEE ON LABOR.

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

GENTLEMEN :—One of the greatest needs of the sugar plantations of the Islands, and one which is continually presenting itself to the attention of the individual planter, and occasionally with great force when he happens to be very short of lands at some critical period of cultivation, is the necessity of a sufficient supply of laborers, and that at a reasonably low rate of wages.

This is a subject which has always taken a prominent place in the discussions at our annual meetings, and at our last meeting, a year ago, occupied as much time perhaps as all other topics put together.

But it is one on which it would be easier to write a report at the close of the annual meeting than at the beginning. For a much better understanding can be obtained of the needs and perplexities of the situation, and of the comparative value as laborers of the various nationalities which compose our laboring population, by listening to the discussions which take place and learning the views of the planters on the subject, and their individual experiences with the different classes of laborers under various conditions.

At the time of our last meeting the labor question had assumed so serious an aspect that it seemed an absolute necessity that more laborers should be brought from some foreign source at once. For the price of sugar had fallen so low, and laborers were so scarce and wages so high—for the latter always go together—the scarcer the labor the higher the wages, especially with our day Chinamen, that more laborers and lower wages seemed a matter of life and death to some of the plantations, and of great importance to all. Two planters at that meeting said they needed one hundred more men each, or they would not only be unable to plant all their crop, but unable also to properly care for the cane then growing. And it was urged very strongly on the Government that either the Japanese immigration scheme which was then being talked of should be carried out at once, or else that a sufficient number of Chinese to relieve the pressing need should be allowed to come to the country.

But the suggestion that Chinese should be allowed to come was not made because the planters preferred them to other labor, or because they believed that unlimited Chinese immigration would be a good thing for the country at large. But the request was made only as an alternative, after they had been given to understand that the Government would probably from lack of funds be unable to carry out Japanese immigration to any great extent, and as a last resort. The question being, more laborers or bankruptcy. It was uncertain too at that time whether Japanese would do as plantation laborers even if brought in large numbers.

As you are all aware, the Government gave its firm refusal to the proposition in regard to Chinese immigration, giving a number of reasons, all of which the planters would have fully endorsed if it had not been for the immediate and pressing need, and no other reliable supply available for the time being.

But notwithstanding their inexorable refusal, they have allowed Chinese to come on the sly, as it were, ever since—2,855 adult Chinese and 35 children having arrived in the country since our last meeting.

We think the planters fully realize the fact that it would be injurious to the country for large numbers of Chinese to come as they do without their families. And now that the labor market is somewhat relieved and sugar prospects a little brighter, and there being two good sources from which to

draw laborers, the Japanese and the Portuguese, both of whom are willing to come with their families, we think there is not a doubt that a majority of the planters would now prefer that the Government should put a stop to the coming of Chinese altogether and bring in a sufficient number of the two former nationalities, and a goodly number of women and children with them.

The two most important changes which have taken place in our labor system for a number of years have occurred since our last meeting, namely, the carrying out of the Japanese immigration scheme, and the now celebrated circular of the President of the Bureau of Immigration prohibiting the arrest and trial before the courts of immigrant contract laborers for breach of contract without first obtaining the consent of a Board of Inspection to be appointed by the Government.

Of Japanese immigrants there have arrived by the steamer *City of Tokio*, Feb. 8th, 676 men and 270 women and children; by the *Yamashiro Maru*, 921 men and 34 women and children. Total number by the two steamers 1,902. It will be noticed that there was a much larger proportion of women and children by the first arrival than by the second. It has been said that the reason for this was that the Government was short of funds; the planter paying the passages of the men and the Government of the women and children. It seems a pity, for it is universally acknowledged to be very desirable that a large proportion of women and children should be brought with the men, no matter what the nationality of the immigrant.

We think that men who come with their families are more likely to be steady and reliable on the plantation as laborers, and certainly more likely to be permanent settlers in the country. We have been told that a large number of Chinamen at one time came direct from China and went to the Kohala plantation on Hawaii; quite a number brought their wives and children with them, and they proved much the most reliable and faithful workers of the lot.

There was a general feeling of satisfaction at the inauguration of the Japanese immigration; and a good deal of credit is certainly due the Government for its accomplishment. But now that the Japanese have been here for several months, there seems to be a great variety of opinion among planters as to their value as laborers. On some of the plantations they give good satisfaction, work hard, and display a disposition to get along with as little friction as possible. Other plantations have had a great deal of trouble with them. In a few instances they have apparently tried to make all the trouble they could, making all manner of frivolous complaints, demanding the discharge of some of their overseers, feigning sickness, &c.

In one notable instance, the first in the history of foreign contract labor brought into the country under the supervision of the Bureau of Immigration, the whole of the Japanese laborers, over forty men, besides women and children, were peremptorily taken away from the plantation by the Government.

On the plantations where there has been trouble with them, we think some of it might have been avoided if the Government and the Japanese Commissioner had taken a little different course from what they did. On the other hand, there is no doubt that in some instances if the managers had understood the character and disposition of the Japanese as well at first as they do now there would have been less trouble. As a rule those who have arrived so far appear to be honest, kind-hearted and saving. They manifest no disposition to quarrel among themselves or with the laborers of other nationalities; nor any inclination for petty thieving, which we

are sorry to say is the besetting sin of some of the Portuguese laborers, nor do they smoke opium. We think they are more muscular and capable of harder work than the Chinese. On the other hand they are very clannish, and when once aroused they are very stubborn and suspicious. Some of them are fond of over indulgence in intoxicating drinks, a vice which the Chinese laborers are not addicted to.

One plantation manager who has a large number of Japanese laborers, informed us that they are fine workers, and the easiest to get along with of any class he ever had to deal with. Another manager who also has a large number, intimated that he would rather have the measles than have any of them around, granting at the same time that they could work well when they wanted to. It is quite possible that when they have been longer in the country they will give more general satisfaction. Two facts in regard to the Japanese are pretty generally affirmed by the planters: first, that they are capable of good hard work when they want to work well; second, that in nearly every instance where trouble has occurred, it has been caused by a few bad ones who have stirred up the rest to bad conduct.

It seems to us matters would be helped very much if those who have charge of selecting the immigrants in Japan should use more discrimination in selecting the people to be brought, and get only those who have been accustomed to work. Also, if instead of removing the whole number from a plantation where there has been trouble, the Government would allow the planter to return only the mischief-makers and dissatisfied ones to the Bureau of Immigration, to be either returned by them to Japan, or put at some Government work in Honolulu, where the true inwardness of their complaints could be better attended to.

In regard to the circular of the Bureau of Immigration that no immigrant contract laborer shall be taken before the courts of the Kingdom for breach of contract without first obtaining the consent of an Inspector, it seems to us that it was a mistake to make such a rule. Not that we think any planter desires that the contract laborers should not have all their rights, and full protection afforded them by the Government. But we think they already had full protection under the law, and that the circular interferes with the protection which the planter should have for *his* just rights. Our main objection to it is that it will often cause unnecessary delay and inconvenience to the planter.

The circular assumes that the Inspector will know more of any case and exercise better judgment than the judge. For it is quite possible that cases will arise where the Inspector will refuse to consent to have a man arrested, where if he were taken before the court the judge might decide the laborer to be in the wrong. The judge takes only sworn testimony; the Inspector is not required to do so, but can and does take any amount of hearsay testimony. And if there are to be Inspectors at all, we think they should be men who would be likely to be thoroughly independent and unbiased. Is there not danger of one-sidedness, well-meaning perhaps, in the judgment of an Inspector of Japanese who is appointed from the same nationality, and who has not by long residence become accustomed to the ways of the country and workings of the labor system, but who has come to the country on the same vessel with his fellow countrymen and is thus likely to view things from the same standpoint, and especially as in deciding a case he can take any amount of hearsay testimony from them?

The complaint has been made that Japanese officials in making tours of inspection of the Japanese laborers have been inclined to make very

particular inquiries into the Japanese side of a question and to pay but slight attention to the manager's side of it; in one or two cases going so far as to make an investigation of the laborer's version of a case and not even going at all to the manager for *his* version.

The effect of the circular is almost equivalent to doing away altogether with obtaining redress before the courts. If there were an inspector for each district it would be different. But having only one for each island is about as bad as it would be to have only one district judge for each island. The majority of the suits for breach of contract depend for their good effect on their immediate trial before the courts. If a laborer quits work in the middle of the day, leaving his ox team standing in the field, but returns to work next morning, or, if a man goes on a spree and leaves work for a few days without any warning, for the planter to be obliged to hire a horse and send a messenger to the other side of the island after an inspector, who may be away from home, and then run the risk of not being allowed to take his case before the court where all the testimony would be taken under oath, seems rather unfair. If a laborer stays away from work for a day or a week, whether on a spree or from feigned sickness, the planter is obliged by contract to board him free just the same.

We have no doubt that the Government made this new departure because they thought it would be the best thing for the country. But we think it was a mistake, and that it would have done no harm to have consulted with the planters before making so radical a change.

Ten or fifteen years ago the laborers on the plantations consisted almost entirely of native Hawaiians and a few Chinese. Now there are comparatively few natives left on the plantations and these are fast disappearing. With the growth of the country in foreign population, and the increase of business enterprises since the Treaty came into effect, the natives have been gradually drawn from the plantations into other occupations—many gravitate to the city where they are made into soldiers, employed on the steamers plying between the islands, etc., etc.—And they may now be almost left out of the question in considering our labor supply for the future.

Aside from the natives, our plantation laborers consist of Chinese, Portuguese, Japanese, South Sea Islanders, New Hebrides Islanders, and a very few of other nationalities.

The Chinese come to the country at their own expense and without their families; do not enter into contracts at all, nor go to work at once lest they should bring wages down, but hang around awhile supported by Chinese head men and secret societies, and through them finally get to work around on the various plantations.

The Portuguese are imported through the Bureau of Immigration under contracts to work for three years. They come with their wives and children; the planter paying for the passage of the men, \$100 or more each, and the Government paying for the women and children.

The Japanese also come under contracts for three years, the planter paying about \$55 for the passage of the men and the Government for that of the women and children.

The South Sea Island immigrants have proved a failure, and it is not probable that any more will be brought to the country.

The New Hebrides people (black) are well liked as laborers, but the attempts to bring them have proved so uncertain and expensive that it is not likely any more efforts will be made in that direction at present.

Of all the classes enumerated—leaving the natives out of the question—we think the Portuguese are the most reliable, and the best in the long run both for the plantations and the country at large.

They do not re-ship to any great extent when their contracts are out, but still they keep on working. At the expiration of their contracts some of them naturally like to change and go to some other plantation to work, but so far as our experience and observation goes the large majority of them continue to work on some plantation. The few who leave plantation work go into small farming and other small industries, which are a benefit to the country. And then their children are very good workers and will grow up to be a benefit to the country as well as the plantations.

The Portuguese day laborer is about as steady a worker and as much to be depended on as if he were under contract, and for that reason is a good offset to the Chinese.

It seems to me that in time the majority of our workmen are bound to be day laborers; for the Chinese do not contract at all; the Portuguese as their contracts expire prefer not to re-ship; and what have we left? The Kanaka will ship but they are fast leaving the plantations; the South Sea Islanders and New Hebrides people are so few in number that they are scarcely to be taken into account; and the Japanese are yet an experiment.

Unless something unforeseen arises to change the situation, it is almost inevitable that in ten years or less the large majority of our laborers will be Portuguese and Chinese day men. And in considering our labor market for the future, does it not behoove us to bear this fact in mind.

Chinamen are coming to the country in larger numbers than any other class. But let us not be at the mercy of the Chinese day laborers. We all know pretty well what that would mean. They are very clannish and will strike for higher wages whenever they can, and if refused will leave the plantation in a body; and if they take offense at the manager or any of the lunas, are liable to leave in the same abrupt manner without the slightest warning. And as a usual thing, the higher wages he gets the less work he performs, for he knows you would not give him high wages unless you were hard pressed for labor and cannot get along without him. This has been our invariable experience with Chinamen—the higher the wages the less work they do.

Whereas, the Portuguese, so far as our experience and observation goes, is willing to do a good day's work whether he is under contract or not—is not influenced in that respect by whether you are short of men or not. And they are not clannish; they do not leave the plantation in a body. If you discharge a Portuguese for being a poor workman or any other reason, the whole gang does not leave with him.

The Chinese are a good class of laborers to have in certain respects; they take up but little house-room; and if a planter wishes a large additional force of men for a short time he can usually get a gang of Chinamen by offering higher wages, and can discharge them in a body when he gets through with them. But we have enough of them in the country already.

Would it not be well for those planters who need more men, or who expect to need more in the future, to put in their orders for Portuguese?

One thing is certain, if enough more laborers are brought into the country, no matter where they come from, the wages of Chinamen are bound to come down. And we think the importation of Portuguese or Japanese labor is more sure to bring down wages of Chinamen than if Chinese are allowed to come in. For the Chinese do not come under contracts and go immediately to work, but loaf around awhile first and through their secret societies try to keep up wages. Whereas, the Portuguese and Japanese immigrants coming under contracts, go to work at once, and thus have a tendency to force down wages at once.

Another reason why we would advocate the bringing of more Portuguese immigrants is that coming with their large families as they do and becoming permanent settlers, they prove a benefit to the whole country. Their children are very hard workers, and every one of the boys, long before he is of age, is an experienced, able-bodied, plantation workman, whom it has not cost \$100 to bring to the country. They are very frugal and industrious, and although some of their savings are sent out of the country, most of it remains here.

It is their great ambition to own or lease a small tract of land and own a few cows, pigs and chickens. We know of the case of one man whose contract expired five and a-half years ago, who continued to work on the plantation for a year, and then obtaining a small tract of land moved onto it, bought a few cows, pigs, etc., and brought his savings, or a part of them, from time to time to the plantation for safe keeping. He now has over \$800 in cash laid up, and the lease of his land having expired he has returned to work on the plantation at \$22 per month.

In comparing the condition of our labor market with what it was a year ago, we think there is reason to congratulate ourselves that it is a good deal better now than it was then. There are more laborers in the country and it is easier to obtain them, and wages have come down a little. We think there are fewer plantations suffering from lack of workmen than there were a year ago. The condition of the Chinese day labor market is a good criterion of the labor market in general, and they are working for lower wages and doing better work.

Mr. R. A. Macfie of Kilauea, Kauai, has sent us a communication with a very interesting table of statistics in regard to the comparative amount of work done by the various nationalities on his plantation, with the comparative cost of each. It is interesting to note that the work performed by the Japanese was the cheapest; that done by the Chinese was not only the most expensive but that they accomplished less per man than the men of any other nationality; and that the Portuguese men though not the cheapest, accomplished more work than any of the others.

Respectfully submitted, A. H. SMITH,
Chairman Committee on Labor.

—O—

The Sugar Bowl of Dec. 5th last states that Mr. Albee Smith, the inventor of one of the best decorticating machines, has just returned from New York, where he has induced capitalists to form a company to build machines; which they will sell to Southern planters *on time*, delivering them at their nearest depot or landing, and take payment in ramie at five cents per pound, or in jute at three cents per pound in its rough state as it comes from the machine. They will also soon establish a nursery for ramie plants somewhere in Louisiana, and will sell them at \$10 per 1000—about one-half the price hitherto asked.

—O—

The Sugar Bowl speaks of the McDonald Hydraulic Regulator in the following terms:

Mr. John S. McDonald's automatic hydraulic pressure regulator, which has so rapidly grown in popularity since its introduction a few years since, has done noble work this season. We have heard of many sugar mills breaking down during the past two months, but in no case where one of the regulators was in use. It is a perfect safety valve, and the feeders can crowd the mill as much as they please, and yet every stalk of cane that passes through receives equal pressure. Not a single complaint about the McDonald regulators have reached us this season.

COMMUNICATIONS.

MAKAWAO, MAUI, January 9, 1886.

EDITOR PLANTERS' MONTHLY : In accordance with your request I will try to give you a few items of plantation news from this part of Maui. All the plantations in this and the Wailuku districts have begun grinding on this year's crop except the East Maui Plantation (Hoffman's), which begins a little later.

The past year has been an unusually favorable one for the crops, the frequent rains through the summer keeping the water ditches well filled; for with us everything depends on the water supply. There is probably not a plantation in either district that could survive but for their irrigation ditches. The Haiku, Paia and Grove Ranch plantations get their supply from a ditch about twenty-five miles long, which has its source in the forests around on the northern slope of Haleakala. This ditch was constructed by the Hamakua Ditch Co. at a cost of about \$90,000. The credit of the conception and carrying out of this enterprise is all due to Messrs. Alexander and Baldwin, and they deserve a great deal of praise for the energy and perseverance with which they carried it through to completion. For it was undertaken before the Treaty came into effect, at a time of depression in the sugar business, when it was difficult to obtain the capital for an enterprise which was considered so expensive and risky. But for the successful operation of this ditch it is quite possible the great Spreckels plantation would never have been thought of.

The Hawaiian Commercial and Sugar Co., commonly known as Spreckelsville, obtain their supply from two sources; one, a ditch thirty-five or more miles in length, running parallel to the Hamakua Ditch Co.'s ditch, but extending a little farther back into the woods, and is reported to have cost \$700,000; the other a ditch starting from the Waihee Valley and running across the Wailuku plantation on to the flats towards Maalaea Bay. The Waikapu, Wailuku and Waihee plantations have their water supply from valleys of the same names a short distance inland.

The Paia plantation began grinding on the 2nd of December. Their works have been considerably enlarged since they last shut down, a second set of rollers, of maceration mill, two more clarifiers, two centrifugals, and a new boiler with steel heads having been put in. They expect a new large vacuum pan in a week or two, which will immediately be put into position, and the present one run in conjunction with the double effect, thus making a triple effect.

The maceration rolls are doing very satisfactory work, and are run without the application of steam or hot water. Last Saturday all the juice from them was run into separate clarifiers by itself, and out of a total day's work of 38 clarifiers four were filled from the second set of rolls, being a gain of over 12 per cent. It was a surprise to most of us, for we

had not supposed the gain to be more than about 6 per cent. It seemed to the writer that the first rolls were not doing quite so good work as they might have done; but still the gain is certainly from 8 to 10 per cent. even with good grinding.

The Paia Mill has turned out so far about 450 tons of sugar—300 of which was shipped in December to the California Refinery under the old contract.

The estimated crop of the Paia Plantation from their own cane is 1934 tons from 434 acres—and that of the Grove Ranch Plantation 1260 tons from 254 acres, two-thirds of which goes to Paia for grinding it.

The Hamakuapoko Mill (Haiku Plantation) began grinding on the 5th of January.

Their maceration machinery is still in the hands of the Honolulu Iron Works, and they do not expect to have it in place ready for use until Feb.

They expect a crop of about 3000 tons of sugar from 600 acres of cane.

This plantation is a good illustration of the advantage of centralization in plantation work.

When they ran the two mills, one at Hamakuapoko and the other at Haiku proper, the amount of cane was not sufficient to keep either mill running to its full capacity; and consequently the expenses for coal as fuel, for they had to use a large amount at each mill, for a double set of mill employees throughout, with the various other unavoidable expenditures, kept the Company in such a financial condition that the question as to when they would get out of debt was one upon which their agents I have no doubt spent many leisure hours in cogitating.

It is now on a good financial basis and will probably prove as profitable a plantation as any of its size on the islands.

Perhaps there is no plantation in the District which has been more benefitted by the past rainy Summer than the East Maui Plantation, for their small ditch does not give them a continuous water supply throughout the dry season, and they are largely dependent on the rain for moisture for the cane. Their fields are looking in unusually fine condition.

This is a small economically managed plantation which formerly, with a low rate of wages and a number of outsiders planting cane on shares, paid very well. But now that wages have gone up and outsiders have ceased to plant, it has had rather a hard struggle. If we could have as favorable a season, as regards rain, every year as we have had the past, there is no doubt that it would resume its old habit of paying its regular annual dividends.

Spreckels Plantation began to grind December 4th. They are grinding on a field of 900 acres of ratoons from which Mr. Williams expected to get 3000 tons. Up to the 1st of January they had ground one-half of the field and it has yielded about 1530 tons or 30 over the estimate. That certainly is pretty close estimating.

With their long lines of railways and great number of cars and system-

atic way of operating everything, they are enabled to keep their three large mills constantly supplied with cane. They expect a crop of 11,000 tons this year. Some of their young plant cane is as fine for its size as any I ever saw. ~~They are getting over the idea that their soil is poor or exhausted.~~ The truth is what it needs is thorough cultivation by some one who has had experience and understands the business, and that it appears to be getting. Some of their young cane on land already once planted before, promises to turn out far better than the first crop did. Their steam plows are of great advantage to them; they plow so deep and break up the soil so fine, and although somewhat expensive, enable them to get through with an amount of work which it would be almost impossible for them to do with horse or ox teams.

One of their mills, the first put up on the plantation stands idle. It was reported awhile ago that it was to be taken down and removed to one of Spreckels plantations on Hawaii—but there it still stands.

I rode around the fields of the Waihee plantation the other day and was surprised at how well their cane for this crop looks.

The Waikapu plantation I understand has a good crop.

The Wailuku, although they will not have so good a crop as in some former years, I believe expect to do fairly well. S.

METHODS OF CULTIVATION.

FRANKLIN H. AUSTIN.

PART II.

In the foregoing Part 1st the present condition of sugar culture, and the preparation of land prior to cane planting, have been considered, and the next item in sequence is furrowing.

This it has been noted is too often but carelessly done. There is much diversity of opinion upon the question of wide or close furrowing, but our space will not permit its discussion here. It is nevertheless a fact that whether a man believe in five or six foot furrows, he can only get a certain number into an acre of land. If however having decided to furrow six feet, he in practice makes one seven feet, another five feet and a third five and a half, or makes one straight and the other crooked, he loses or gains land in proportion as the average of his furrows is more or less than six feet. And whether he gain or lose land he must necessarily lose cane. For, by deciding to plant six feet, he assumes that this method will grow the most cane that can be raised on the land. If he argues that the seven foot row will grow more cane, and make up the loss, then he refutes the first assumption and should have planted seven feet: so in the case of the five foot row, the cane would be stunted and equal loss sustained. Therefore it is apparent that the nearer mathematically parallel furrows can be made, the more cane can be grown per acre. According to present means this is next to impossible, for all furrowing plows that

have come under my observation are not only gormandizers of power, but so unwieldy that they cannot be handled with any degree of precision.

Planting could with great profit be made the subject of a lengthy paper, but it is necessary to limit these observations to a few remarks upon main points. Although as has been remarked there is a great diversity of opinion here, as upon almost all subjects, pertaining to cane raising, it nevertheless seems reasonable in all cases that the eyes be placed firmly into the ground: because, 1st, the eyes being on the sides, the shoots break through the soil simultaneously, having equal soil and equal chance for growth, whereas if thrown in promiscuously, one eye may be turned up and the other down, the upper eye then has too much sun and too little earth, while the lower one not only has too much earth, but must twist out of its natural direction and curl round the body of the seed. In soggy land or wet districts it is almost sure to die before it performs this feat of contortion. 2nd, by pressing the butt end of the seed firmly in the soil, it becomes hermetically sealed, preventing the juices from quickly evaporating. Where body seed is used the whole seed should be pressed into the soil and both ends covered. The Kohala plan of planting across the row, serves this purpose well, as both butts are hermetically sealed by the side of the furrow. The objection to this method however is in the fact of more difficult cultivation, and the likelihood of disturbing the seed with cultivators. There may be places of great fertility where these precautions are not necessary to the raising of good cane, but wherever the soil is poor or afflicted with a superabundance of moisture, they are absolutely necessary to the production of profitable crops; and if benefit is thus gained upon poor soil, why should not benefit be proportionally gained by the same precautions on good soil.

The Coleman cane planter which we promised to discuss, totally disregards these precautions, and attempts too much concentration in one implement; namely furrowing and planting at the same time. Which, even if the planter, or rather seed dropper were constructed so as to imitate the hand method above mentioned, would still be impracticable: because: 1st, all lands that I have seen should be subsoiled in the bottom of the furrow, and though it is not generally done, it stands to reason, that cane would do better for six or eight inches of loose soil under the seed. And 2nd, Mr. Coleman takes the model of his mould board from the common furrowing plow, which requires in draught eight large animals; the planter would require at least two and perhaps four, which is an impracticable team. If a cane planter is practicable it must resemble hand planting.

Upon proper after cultivation, perhaps as much as on careful planting depend profitable yields. Theoretically all planters know what good cultivation is, but few accomplish it in practice. This great discrepancy between theory and practice is due mainly to two causes; 1st, the short-sighted and parsimonious policy of some agents, in not allowing their clients sufficient advances to keep well stocked either in animals or manual

labor. Most estates are from year to year increasing their acreage, so advances and labor should be added in ratio of the increase. And 2nd, a large proportion of poor cultivation is due to the great scarcity of labor, prevailing up to a recent date.

Although all experienced planters know good cultivation, there are nevertheless points not generally conceded, which could be profitably discussed.

Much depends upon the judgment of the cultivator owing to different conditions in different districts, but such a question has arisen as the well healing in and hilling of both plant and ratoons, which is much thought upon in the district where I am situated, and which if proved to be beneficial in one place, must prove so in all unirrigated fields. Some go so far as to advocate almost no hilling at all, while others hill both plant and ratoons above the surface, covering into the cane all the weeds that grow between the rows, and even the first stripping. The latter point appears to me answered by the ground taken above, upon the turning under of spontaneous vegetation.

It cannot be doubted that the most essential point in cultivation is that of keeping the soil constantly mellow, even to the depth of the original furrow; for note the prompt intimation given by the cane, if its roots have not free access to loose soil, by the sudden change of color in the tips of the leaves from green to yellow. Where soils are naturally free and mellow, this is not a matter of great anxiety to the planter; but where the tendency is toward packing, it becomes an item of great care and requires constant attention.

The *honohono* grass, which is probably known to all planters, proves in nearly all parts of the Islands an element of much annoyance, and it is usually thought necessary not only to hoe it and shake it, but to carry it by hand from the field. Although I do not advocate removing any vegetation from the land, I am satisfied an implement could easily be constructed to rake up the grass after it has been cut, and carry it from the field, ~~thoroughly shaking the dirt from it in the passage, with a power not~~ exceeding the work of one horse.

We pass now to stripping, which is universally considered a necessary expense, differences of opinion only arising upon the question of the number of times and the proper time for each stripping. These questions should be decided by close observation, and proved by clear facts, and positive reasoning. We know that stripping increases the quality of juice, and we believe the growth of cane is assisted by it. But how much do these advantages increase the yield of sugar? and is this increase proportional to the expense. Although I do not wish to be considered an advocate of no stripping, but on the contrary with my present light, a strong advocate of repeated strippings, I would nevertheless remind all thinkers upon this subject, that we are probably the only sugar growing country that strips cane at all. All the estates that I visited during my

stay in Cuba and San Domingo, did, what would be called here very poor cultivation in this particular, and the planters were shocked at the idea of going to so great an expense, when the matter was mentioned. Mr. Tucker and Mr. Marsden report from Jamaica that no stripping is done, and I believe that this is also the case in the Fiji, Australia and French Colonies.

Are we then so far ahead of the world, or are we under delusive theories, incurring an expense that may be wiped from our ledgers?

Harvesting is the last and undoubtedly the most expensive of all single operations connected with cane culture. Not only is it necessary to handle each stick by hand, but to cut it in two and sometimes in three places, namely at the root, top and middle. By far the most difficult is cutting at the root, as it has to be done in a stooping position, and the grass and rubbish accumulated about the stool cleared away. Could an improvement be made that would do this part of the work, at least two-thirds of the expenses of cane cutting would be relieved. Such machines have been attempted, but all inventions have as yet fallen short of practical utility. This I judge to be due, mainly to two causes; 1st, the unevenness of the land—the difference between hilled and unhilled cane—the accumulated rubbish and grass at the stool, and the danger of cutting too high. And 2nd, the fact that cane does not stand, but lies in thick tangled masses over the ground. These are huge and apparently insurmountable difficulties, yet I believe they can be overcome, and an implement be constructed that will not only handle the cane into a proper position for cutting, but be adjustable to cut close on any land, and lay the cane in even layers along the row, so that topping and bundling will be easy: besides so clearing and cleaning the stool, that the first working on ratoons will be done away with.

Much depends for the growing of good ratoons, upon the proper treatment of the cane stool after cutting; and more upon the proper cultivation of the plant cane. It has been repeatedly observed and proved by experiments, that plant cane well hilled or healed in, produces better ratoons than when the furrows are left open, and it stands to reason, for if the butt end of a top seed be stuck into the ground leaving it upright, the eyes will put forth with as much vigor as if the seed were planted in the usual manner; and if sufficient soil be drawn around it will produce as good a hill of cane. Again if the top of a long stick of cane be broken off before it tassels, every good eye on the stick will put forth a shoot. The action of stools is identical with that of the seed placed upright, except that the former has the advantage of the top or lower roots to give it greater force and continued sustenance. The deeper then the stool the greater number of eyes will there be to come, the greater number of sticks grown, and a larger amount of sugar realized. This should be proof positive of the efficiency of hilling plant. To give these numerous eyes a chance to start, it is necessary to cut away the upper roots, and turn them

from the stool, putting it in the position of an upright seed. The late Mr. Lidgate, who was a keen observer, and good cultivator, not only advocated this, but remarked that if it would not cost so much, he would have all the soil pushed away from the stool, so that it might have the immediate action of sun and rain.

In almost all parts of these Islands I believe the cane leaves, and trash remaining from cutting are burned. This should not be done for the same reason set forth above, against removing spontaneous vegetation. Planters who recognize this fact and act upon its suggestion usually bury the trash. This is done by first hauling it all on top of the stool, then a furrow is plowed, the trash hauled in to it and covered with a plow. To aid this work, I think attachments might be placed upon the plow to handle the trash, thus doing away with most of the hand labor.

To be concluded.

LETTER FROM DR. J. MOTT SMITH.

THE EXHIBITION AND DIFFUSION.

In a letter recently received from Dr. Smith, he speaks of the results of the Exhibition and of the diffusion experiments, as follows:

The Exhibit has, in my opinion, done us great good in the South. It has been popular, and has brought us in contact with people who have hitherto known nothing of us except to our prejudice. Invitations to take the exhibit to various State Expositions, such as Richmond, Va., Macon, Ga., St. Louis, Mo., would have made me a perambulating showman if I had the means or the disposition to accept.

Since my return to Washington I have had a talk with Dr. Wiley about the diffusion plant and his experiment with it in Kansas during the summer proves that it will need some modification to adapt it conveniently for cane—especially the management of the discharge valve at the bottom of the tanks, for the easy and quick discharge of the cane chips. He has now gone to Europe to examine and visit the various beet establishments, and so to perfect his diffusion plant that it may be thoroughly adapted for canes for the experiment in Louisiana, which has been postponed until next year.

His manuscript report of the experiment in Kansas on sorghum canes, which he showed to me, proves to me that the diffusion process can be advantageously applied to canes. The extraction of the juice was less expensive than by mills, and the yield much larger. Dr. Wiley now feels confident that the process will speedily replace the old method of crushing. When the report is printed he will furnish me with copies for distribution on our Islands. He has overcome the difficulty of a cane slicer, having sufficient capacity by placing the knives in the radius of a revolving disc of seven feet diameter. I saw such a machine in a paper-mill in Louisville which sliced wood of five inches thickness. It struck me then that such a

machine would do the business for canes. Dr. Wiley said he had no difficulty in supplying sorghum chips for his battery. The begasse showed that *all* the saccharine had been extracted by the battery. I say hurrah! over these experiments, for when we once get 90 per cent. out of our canes we can snap our fingers at the beet growers.

I remain yours truly,

J. MOTT SMITH.

HONOLULU, January 12, 1886.

EDITOR PLANTERS' MONTHLY: Since the publication of your last number I have had from Queensland the following illustration of the advantage of using duplicate mills for double crushing, referred to in my paper last month.

Extract from a letter from the chief engineer of the Colonial Sugar Refining Co.'s Victoria Plantation:

"I rode over to a neighboring plantation last Sunday and had a look at the biggest smash I ever saw in a sugar factory. It is one of Smith's plants, and is the most powerful *crushing* plant on the river, the rollers being six feet long and three feet in diameter, double crushing. One of the teeth broke in the intermediate gearing, and got carried round in the grease, so that the next revolution the point of the pinion tooth jammed against it. It tore the mill foundation all to pieces, cracked the mill bed right across, split the mill cheek from top to bottom, and burst out one of the caps of the back roller. They are now crushing with a single mill."

Yours,

ROBERT CATTON.

BANANA CULTURE.

BY A. MARQUES.

I.

The word Banana generally awakens ideas of a tropical soil, in which vegetation is so luxuriant that it is sufficient to stick a cutting of any kind into the ground, for it to grow without any further care; also, more especially about banana growing, the mind is disposed to believe that the word "culture" is absolutely obsolete, and that all that is required is to make a hole in the ground to receive the stump and then leave it to the tender mercies of Nature for it to reproduce itself eternally by its shoots, yielding abundant fruit all the year round. It may be so in some absolutely tropical countries, but in the semi-tropical Sandwich Islands, where bananas only do *fairly* well, it is solely by dint of culture, and I might say considerable and intelligent culture, that any satisfactory results can be obtained. The cause of this is probably complex and due partly to our climate and soil, and partly to the nature of the variety required for exportation. This will explain why, having been asked for information on the banana culture I must be allowed to enter into more details than are generally given on this peculiar crop, and I beg here to present my best thanks to the friends who have kindly allowed me the help of their practical knowledge, and especially to Messrs. Lycan, Henson and W. Hill.

II.

The first thing is to enquire into the varieties of the banana plant and their requisites. Of course, here as elsewhere, numerous varieties are known, probably over sixty, says Mr. Hill, though this includes bananas and plantains, and it will perhaps be well to say that the best informed modern writers make a distinction between these two near relatives, the banana being edible raw whilst the plantain requires cooking. We have seen several varieties of these last, whilst of the banana kind, many are indigeneous, and the others brought from various countries. Several do not thrive well, except in particular spots, and consequently are extremely scarce and but little known, while others grow wild, increasing and spreading without cultivation in a few favorite locations. But it would be foreign to the purpose of the present article to enter into any details about varieties, for the reason that the home consumption being naturally limited, the only object of the banana as an agricultural staple and a trade, is for exportation, and the varieties fit for this are very limited indeed. So, to make it short, only two or three varieties are to be found in the Honolulu market, and out of these, only one is used for shipping, though there could undoubtedly be found several others good for this purpose, and of much better flavor than the one commonly preferred. This is called the Chinese banana, for what reason is not explained, because it is known to have been brought from South America by General Miller, English Commissioner, who gave the first plants to Captain Adams at Kalihikai, whence they spread all over the Islands, specially of late years, as the very favorable results obtained by the first exporters gave a sudden and considerable impulse to the culture of this variety. The principal reason probably of its being preferred by the growers is the fact of its being a rather dwarfed tree, compared with other varieties, its trunks varying between four and eight or nine feet in height, which renders more easy the gathering of the bunches. These attain a greater size than almost any other variety here, varying from sixty to ninety pounds weight, and even more, and its peculiar but agreeable flavor makes it an excellent fruit for eating raw, though inferior to many others for cooking purposes. Outside of this variety, growers wishing to select kinds for exportation, ought to prefer those whose fruit have the property of adhering firmly to the stalk, even when over-ripe, withering or nearly rotting; the kinds "spilling" their fruit, which fall off the stem as soon as maturity sets in, are of course an inconvenience for exporting. But in this paper it will be understood that I specially refer to our China variety, which is multiplied by sprouts alone, or suckers (ratoons) from the mother plant; one kind however, the Manila one, can be propagated by seed, while the indigeneous varieties are said not to show any rudiments of seed at all.

III.

Few plants, more than the banana, are susceptible of being modified and improved by culture. They readily show their appreciation of good

care by the largely increased bulk and improved flavor of the fruit; and as large bunches alone are accepted for exportation, it will be clearly seen how much proper culture or careless neglect can interfere with the material results and profits.

As far as soil is concerned, in spite of the idea generally entertained that they thrive only in a friable and light soil, although not so sandy as to allow the too rapid escape of water, and that any attempt to grow them on stiff clay lands will prove a failure, yet in the Hawaiian archipelago, experience shows that they yield to good culture, as much in heavy, compact soils, as in the light ones, though the rich alluvial loams are certainly the best; sandy soils, whether of ordinary sand or of the well known volcanic black lava sand, are the ones to be avoided. One thing however, is certain, and that is that bananas will thrive best in damp valleys. But they will grow in the driest spots, provided a good supply of irrigation can be afforded, with this attention nevertheless, that while water may be abundantly used in porous soils, care must be taken, in our heavy lands not to over irrigate; the soil must be kept moist, but not allowed to form cake and clog up and stifle the roots.

IV.

Mr. Hill wrote once, that "the China banana requires better soil and more attention than any other variety, but with suitable soil and proper culture, it is capable of more improvement, both in delicacy of flavor and largeness of yield." This explains why so many who cultivate this variety for exportation, obtain such poor bunches and consequently so little profit. As Mr. Henson says: "Many banana growers feel perfectly satisfied with grubbing the surface of the ground in order to clear it and kill the weeds, then they dig a hole in the hard ground and set the young plant in." But such primitive methods soon bear their punishment: "The plant grows pretty well for a few months, but as soon as the young roots, which expand laterally to the distance of several feet, reach the hard soil, they are unable to penetrate it, and in consequence the young plant, short of nourishment, remains stunted and sterile, or is not able to produce a full sized bunch."

There is consequently no divergence of opinion among intelligent growers, that the *great secret* of profitable banana raising is the thorough preparation of the soil, as I myself have verified by sad experience, and I see that the same is admitted in the West Indies, where considerable areas of the best land are devoted to banana culture for exportation to the eastern coast of America and to England. All superior crops obtained in this country, have been the result of deep cultivation, Mr. Lycan has his land first plowed twice, cross ways, as deep as possible, then harrowed, and then dug through with mattocks, before planting. Mr. Hill digs the whole of his land by hand, from two and a half to three feet deep, having the care of putting at the bottom of the trench the surface soil, and bringing to the top the crude stuff of the underground, which is thus

aerated previous to the next culture, which reverses all the soil again. Mr. Henson digs "from fifteen inches to two feet deep, burying all the rubbish around," but he recommends to throw the soil up into ridges, as high as possible, which must increase the depth of cultivated soil, and he finally warns not to be afraid of digging too deep, "the first cost may appear heavier, but the yield of fruit will also be much heavier and future expense so much lighter, that no regret will follow the primitive large outlay."

Bananas are very fond of assimilable substances, and if the soil is not very rich, it may be well to give it plenty of manure from the start; human manure is not considered favorable, unless thoroughly decomposed; horse manure is good, but its effects are exhausted too soon, and consequently before the fruit is formed; cow's manure is better suited to this plant as its effects last longer, but the best of all is pig's dung, which is worth twice as much as cow's, and four or five times as much as horse's. The refuse from the fabrication of taro into poi is also most excellent.

In rich soils, the first crop may give very good results without manuring, but the following ones, from the sprouts, generally require an additional stimulant and, at any rate, in this country where the banana fiber is not utilized, the best thing the grower can do, is to chop up with an ordinary hay cutter, if he has one, or simply with the spade, the stems of the old tree, after the bunch is cut away, and to put it around the young plants, which afterwards must be carefully moulded up. One must never hesitate to manure slow plants or poor spots of ground.

V.

After preparing the soil, the next thing to consider is the irrigation. In Jamaica, it is supposed that at least one cubic yard of water per hour to the acre, which is equivalent to 68 inches of rain fall per annum, is the medium quantity required. In these islands, as I have already said, a difference is made for the clay, stiff soils, and for sandy porous ones. In this last kind, Mr. Hill has found that the best way, is to set the banana beds to a perfect level, and to dispose the ditches so that the water has to run alternately from the bottom or end of the first row into the second, then up and from the top of the second row into the third, and so on, in a zig-zag way, so as to force the water to run slowly and thus to thoroughly permeate the beds. But in compact soil, a quicker flow is better, and then, "whether the rows be straight or crooked depends on the lay or roll of the ground." There is of course no rule about the frequency of irrigation, which depends as much on the nature of the soil, as on the location and exposition, and on the frequency of showers; one thing must however be remembered, that bananas can be over-watered, and in that case they will not thrive.

(To be continued.)

SELECTIONS.

AN AUTOMATIC CANE FEEDER.

(From the *Sugar Bowl*.)

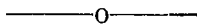
The following article was read before the Louisiana Sugar Planters meeting, on October 8th last, by Mr. T. M. Cage, of Terrebonne, La. :

After observing for years the feeding of cane mills by different classes of labor in this country and Cuba, I have been forced to the conclusion that, to produce maximum results, cane must be cut and shredded and automatically fed to the rolls. Therefore, I have taken out a caveat and had constructed a working model of an attachment, which, I think, may aid in a measure to attain the desired end.

The canes, either cut or shredded, fall into a hopper or receptacle, and from thence are automatically fed to the rolls by an attachment of required diameter, moving with the same periphery speed as the rolls, thereby furnishing them, across their entirety, the same quantity of chips. The feeder is driven by the lower roll. The amount of feed can be regulated by opening or closing a door or otherwise. The cutting machine should furnish chips faster than the requirements of the mill, which will enable the hopper to be kept full, or nearly so.

The drum or shaft, on which the feeder (somewhat similar to model, or toothed,) is placed, should be furnished with a clutch similar to those used on cane carriers, which would enable the operator to have entire control in feeding the mill. The last test was made on the 25th of September. Baume of juice 6°, when 600 lbs. of cut canes, about one-half in. were passed through the mill, which had been recently toned and not brought down well to her bearings. The result was, 167 lbs. bagasse, 433 lbs. juice, equal to 72 16-100 per cent. extraction. Then 600 lbs. of uncut cane, placed with regularity on the carrier, were passed through the mill without any alteration, when 195 lbs. of bagasse were obtained, and 405 lbs. juice, giving 67.5 per cent. extraction. The difference between the cut and uncut canes was 4.66, although, in the former case, there was but 60 lbs. pressure on the boiler, whereas, in the latter, the steam had augmented to 75 lbs. It was observed that the mill moved with much more apparent ease with the cut than uncut canes. During our first trial, made some months since, we simply elevated the turn plate and had no trouble. The last test was made when a plate had been added, with the same result. I think more juice can be had in a given length of time, and with less power applied to the rolls, less risk of breakage, the feed being regular and uniform. Anyone who has watched the feeding of a mill on a cold, wet night, particularly, is well aware that, with crooked canes, it is absolutely impossible to get the carrier fed with that uniformity which will insure the best results.

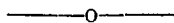
The automatic feeding of the bagasse from the first mill to the supplemental rolls, I think, is of as much, if not more, importance than at the first expressing—that is, where the first rolls do a considerable portion of the work required. The knife which frees the lower roll of bagasse frequently bunches it, thereby rendering the feed uneven. The automatic attachment, of required construction, will in a great measure correct the evil. The growth of our cane and the risk of freezing renders it futile to attempt, on a large scale, to produce excessive tonnage. The beet root grower, as a rule, is not permitted to use stable manure, or fertilizers rich in ammonia, as such treatment produces a large tonnage poor in sugar. About 12 tons is an average, whereas we can get good results from 25 tons of cane per acre. The beet sugar producers have arrived at almost perfection in the extraction of sugar from beets, whereas, we in Louisiana, until very recently, were satisfied with from five or six per cent., where there is a possible 10 to 12 per cent. Therein lies the hope of the cane growers of the world. The increase per ton, and, therefore, per acre, must be arrived at, not only at the factory, but paramount in the field, as it is the high saccharine strength of the juice, more than in large extraction, which gives the yield of sugar. Thorough drainage and tillage rank superior to any fertilizer, yet to get superior results no one essential can be overlooked; owing to the depression in values, the intelligence of the cane growers of the world is now turned toward solving the momentous problem how to produce a pound of sugar cheaper than in the past, either by the improvement in methods or change in field manipulation, or in the two combined.



MOVING A NINETY FOOT CHIMNEY.

One of the most difficult transfers of heavy structures yet attempted was successfully completed in Salem, Mass., a few weeks ago, where a brick factory chimney, 90 feet high and only 6½ feet in diameter at the base, was taken up and moved, with the aid of six men and two horses, 100 feet, and safely deposited upon a new foundation. The chimney was nearly cylindrical, the upper diameter being 5 feet: and it was estimated that a sway of 3 inches from the vertical would bring it to the ground, so that great precautions were taken to prevent lateral movement in transferring it to the platform on which it was to be transported. A cage was first built around the chimney, consisting of horizontal timbers supporting shores, which extended 23 feet up the sides of the shaft, and were re-enforced by a second set of shorter ones beneath. After these were in place, and well secured, holes were cut through the brickwork and needles inserted, under which thirty-four jackscrews were placed, and the shoring and shaft raised together high enough to allow a rough platform to be constructed under them, and rollers to be set in place. The platform,

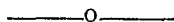
which was of strong plank, extended to the new position of the chimney, and by leveling it carefully, and employing a large number of rollers, the load, weighing 130 tons, was easily moved into place.



HINTS FOR BUYERS OF MACHINERY.

Messrs. R. Hoe & Co., the well known printing press builders, give the following practical suggestions, intended without doubt to apply to the purchaser of printing presses, but their hints are equally pertinent to other classes of machines :

"In buying a machine see that, whether new or second hand, it is strong and well made. Consider the standing of the maker, both as mechanic and machinist. A light framed or shakily fitted machine will be dear at any price. Do not be deceived by any beauty of paint or finish on exposed work, which adds nothing to the usefulness of the machine, and which may draw the eye from an examination of the working parts. Uncover the boxes, and see whether the finish of shafts in their bearings of journals, is as smooth and true as the white and brass work of more exposed pieces. Take out, here and there, screws and bolts; see if the threads are deep, sharp, and well fitted. Look closely at the fitting of all toothed or pinion wheels; note whether they have been cast and filed to fit, or whether they have been accurately cut by automatic machinery, so that they will fit in any position. Slowly turn pinion wheels, and note whether there is any rattling or lost motion, or whether the teeth fit snugly, yet freely, so as to give even, steady motion. Closely examine all castings for pin holes or air bubbles, which may be most easily detected in work that has been planed. See that castings are heavy as well as solid. Look after oil holes and provisions for oiling. See that castings are neatly fitted that they do not show the marks of the hammer or file, which may be used to connect them if they have been forced or badly put together. Pay attention to the noise made by the machine when in motion; if fairly fitted, the noise will be uniform; if badly fitted, it will be variable or grating."—*Scientific American*.



THE rabbit pest is a fearful scourge in Victoria. By every train baskets and cases of fat looking bunnies are sent on; still the rabbits are swarming in the back country, protected by the shelter everywhere abounding in the primeval wilderness. At the last meeting of the Wyndhamshire council, Mr. Chirnside stated that it would cost him £5,000 to clear the rabbits from the Werribge Pearl Estate. The president of the shire alluded to the scarcity of labour in the district, and declared that although he required fully twenty more men to destroy rabbits on his Melton estate, he was unable to get them.—*Australian Planter and Farmer*.