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KENTUCKY, having made a success of growing tobacco, proposes now to turn its attention to raising coffee, and making beet sugar.

DR. MAXWELL, director of the experiment station, left for Kohala, Hawaii, during the first week in August, to visit the plantations of that district. He will return the latter part of August.

ELECTRICITY has been introduced as the motive power in running centrifugals in France. It is contended that more sugar can be dried in the same time than when steam or any other power is used.

IN Germany street cars are propelled by gas engines, and are said to give satisfaction. Gas engines have been introduced into England as moters, but their work has not been so satisfactory there.

SWEDEN, which is generally supposed to possess a climate too cold for the profitable production of grains and vegeta-

bles, last year manufactured 77,000 tons of beet sugar, about 12,000 tons in excess of her domestic consumption.

THE annual consumption of lemons in the United States amounts to 3,000,000, boxes, containing 300 to 360 each. This immense supply has been almost wholly imported from Sicily, 2,700,000 having come from that country in 1893.

LATEST market quotations, given by Williams, Dimond & Co., August 2, were: Cuban centrifugals 96 deg. test, \$3.25; Hawaiian rice, \$4.25; Kona coffee, 20c. and 21c.; Golden Gate flour, \$3.25. All advices from Cuba are very indefinite, but the sugar prospect looks bad, owing to the rebellion.

THE year 1895 promises to be a very successful beet sugar year in Nebraska. The crop is unprecedentedly large and fine in quality, and there are twice the number of growers there were last year. Beet growers will receive a state bounty of five-eighths of a cent a pound on their sugar, for three years to come.

THE special session of the Hawaiian Legislature closed on the 15th instant. The two most important measures passed were the homestead act and that relative to a cable between Hawaii and the United States. The homestead or land act is a revision of all previous laws relating to the sale of government lands, and will supercede all former legislation concerning them.

HAWAIIAN SUGAR EXPORTS.—The statistics of the Custom house, for the first two quarters of the current year have been published by Collector-General Castle. They show that the exports of sugar for the first six months of 1895 have been 245,800,784 pounds. This includes the several shiploads that have gone to New York.

IF even a high American tariff has not availed to keep out European fabrics made with cheap labor, what kind of a tariff will be required to protect the United States from Japanese and Chinese manufactures made with still cheaper

labor? No American manufacturer, no American workman can look toward the East with clear vision without regarding the prospect as appalling.—*Exchange*.

A RECENT report of the Washington Department of Agriculture, gives the total length of railways in the world at 418,676 miles. Of this total, there are in the United States 178,709 miles, and on the North American continent, including the United States, 201.625 miles. Germany stands second, with 27.863 miles. The total capitalization value of all the railroads in the world is \$33,976,589,087.

"I HAVE learned from observation that three things surely happen to a man who works steadily without relaxation. In the first place, he becomes nervous, irritable and hard to get along with. In the second place, the grade of his work falls off, and he is liable to err in his judgment. In the third place, he dies suddenly. It is an incontrovertible law of Nature."—CHANCEY M. DEPEW.

Cows when being milked will consume nearly fifty per cent more water than the same cows when not giving milk. The New York Experimental Station at Geneva found as an average of several breeds that each cow drank 1,039 pounds of water and consumed 547 pounds more in food per month. During lactation the average per month was 1,660 pounds drunk, and 774.8 pounds consumed as food.

A CORRESPONDENT of the Tropical Agriculturist of Ceylon, communicates the following: "There is at present in a garden down here a mango tree lately pruned of its branches, and from the stump of one of the latter there has grown a bunch of mangoes; the cluster of fruit counting over one hundred. Has such a thing been experienced in Ceylon or elsewhere before?"

535 CHINESE and Japanese arrived by the steamship *Belgie*, from Hongkong and Yokohama, seeking employment as laborers. All of them have engaged in service at the rates current for green hands on plantations. The *City of*

Pekin took away over 300 Japanese laborers, returning to Yokohama, after having spent three years on the plantations. No Japanese laborers go from here to America, reports to the contrary notwithstanding.

THE constant decline in the price of sugar in sugar-producing countries is due mainly to improved processes of cultivation and manufacture, that have increased the percentage of sugar obtained per acre and from the saccharine juices. Within a year sugar has declined one cent per lb. Were it not for the 40 per cent. duty (about one cent. per pound) placed on sugar by the new tariff, refined sugar would be retailed in the United States at four cents. per lb.—*Ohio Merchant*.

THE *Melbourne Leader* mentions that two Viennese bacteriologists have been examining some bank notes that have been in circulation for a few years, and estimated the number of microbes on them at 19,000 or more on each note. Besides a specific microbe, which has a deadly effect on animals "inoculated" with it, they are reported to have found eight pathogenic species, amongst them the bacilli of tuberculosis and diphtheria, and the streptococcus of erysipelas.

WHILE the beet industry has apparently exhausted all possibilities of further economy in cultivation and manufacture, the cane sugar producers have it yet in their power to still further cheapen the cost of growing and manufacturing their product. The central factory system is still capable of great development, while the methods of scientific cultivation and manufacture have not yet reached their limit by any means.—*N. O. Picayune*.

WE have received from Director Stubbs a copy of the Fifth Annual Announcement and Catalogue of the Audubon Sugar School, located at Audubon Park, Louisiana. It shows students from Spain, Cuba, Hawaii, Porto Rico, U. S. of Columbia, St. Croix, Chicago, California, Mississippi, Texas, Tennessee, Nebraska, Kansas and Louisiana. The object of the

school is to produce experts in the sugar industry. It is presided over by Dr. W. C. Stubbs, who is assisted by a staff of six instructors.

FOR the first time in the history of sugar beet culture in Nebraska, the beet growers this year will produce more beets than the factories are willing to contract for. The presumption is that the Norfolk and Grand Island factories will be taxed to the utmost to consume the beets that will be offered. This argues for more factories, more employment, more money brought into Nebraska, and greater profits to farmers in the vicinity of the sugar factories.—*Omaha Bee*.

THE FUTURE OF SUGAR.—Notwithstanding the imposition of a 40 per cent. duty, the price of refined sugar is only three-eighths of one cent per pound higher for 96 degrees centrifugals than at the same time in 1894. At this writing 96 degrees centrifugals are $3\frac{1}{4}$ c, cash, duty paid; standard granulated, 4.44 cents net. These low prices are the result of large crops, estimated for the season of 1894-95 at 8,323,000 tons, an increase over 1893-94 of 929,375 tons, and over 1892-93 of 1,854,000 tons.—*American Economist*.

THE Colonial Sugar Refinery Co. of Sydney reports for six months ending March 31, 1895, as follows: "The profit after providing for interest and all other charges, amounts to £90,642 11s 9d; to which sum has to be added the balance at profit and loss account on 30th September, 1894, £82,186 17s 5d; leaving available, £172,829 9s 2d. From this amount the board proposes to appropriate to payment of dividend at the rate of 10 per cent per annum, £84,999 2s 8d, leaving to credit of profit and loss account, £87,830 6s 6d."

THE FASTEST YET.—Messrs. Robt. Hoe & Co's new printing machine, prints, cuts, pastes, and folds ready for use 1600 newspapers per minute. It is called the "Sextuple" newspaper press, and is now in use at the office of the *New York Herald*. It prints upon both sides of three continuous webs of paper supplied from three separate rolls, and delivers the paper folded, pasted and even counted in bundles at the

enormous rate of 96,000 four or six page papers per hour; 72,000 eight page papers per hour; 36,000 sixteen page papers per hour; and 24,000 fourteen, twenty, or twenty-four page papers per hour.

THE beet sugar crops in California are reported as looking very fine, and largely increased in area, over those of 1894. Watsonville claims 7200 acres of beet growing, while Chino and Anaheim have even more. The output from these two estates will probably be at least twenty-five per cent over that of the previous year. There seems to be no question now that sugar beets will grow well from San Diego to Puget Sound, and that the manufacture of beet sugar on the Pacific coast will soon exceed the local consumption there.

WELL STATED.—Man has natural wants—food, clothing, shelter; he consumes, he should produce; hence activity—labor. He thinks, he reasons, he learns, he progresses; hence science—learning. He has enthusiasm, attachment, passion, feeling; hence emotion—love. Labor, learn, love. Man must be able to do all these, or he retrogrades and degenerates. Any state of society which prevents man from fulfilling his destiny, which is to do all these, is therefore false and incomplete.—*Journal of Knights of Labor.*

MR. W. J. LOWRIE, manager of the Ewa plantation, near this city, left on the steamship *Australia*, for a three months vacation in the United States, of which he is a native. He will visit Louisiana to inspect plantation and mill work there, and we commend him to sugar planters there and elsewhere as a representative American, proud of his adopted country and its progress, as he is of his fatherland. He will probably find Louisiana a little ahead of Hawaii in some respects, and be ready to adopt any improvements that he may see.

LOUISIANA planters are said to hold 25,000,000 gallons of molasses stored in tanks on the various sugar plantations throughout the State. What to do with it, is the question puzzling the owners. Shall it be burned as fuel, distilled for

alcohol, or fed to cattle? To throw it away is to create a nuisance. Here is a chance for some inventive genius to turn a by-product into valuable commercial substances. Nothing of the kind happens in Hawaii, for our planters learn to turn all their molasses into sugar. This accounts in part for the large yields.

LEGAL AXIOMS.—In law, what a man ought to know he is held to know. Fraud vitiates all transactions. A person cannot avoid the legal consequences of his acts by protesting, at the time he does them, that he does not intend to subject himself to such consequences. To the extent of the discharge by a foreman or other superior servant of those duties which the master owes to his servants, such foreman or other superior servant stands in the place of the master, and for his acts the latter will be responsible. A servant is never liable to a third person merely for not doing that which it was the duty of the master to do.—*Chicago Baker's Helper*.

LOUISIANA SUGAR INDUSTRY.—Low prices for sugar have forced the Louisiana planters to adopt more economical methods of cultivation and manufacture. The central sugar mill is in favor. A new plant capable of grinding 1,200 tons per day is being built along the line of the Mississippi Valley Railroad with a view of commanding the cane supply grown along that line between Baton Rouge and New Orleans. There is a large area of land still available. The New Orleans *Picayune* says that the only obstacle to the development of such area is the absence of sufficient milling capacity.

BENEFICIAL INSECTS.—The Rhizobii which were introduced into the orchards of Los Angeles, San Bernardino and Riverside counties with so much hope last season, and which to the great disappointment of many, seemed to utterly disappear, are again coming to the front. They are now to be found in increasing numbers, both larvae and beetles, at Riverside, Ontario, Claremont and Pomona. It is stated that they are repeating the good work done at Santa Barbara.

in Ventura county. What a boon it will be if they eventually subjugate the black scale and other related species in the orchards and gardens of Southern California.—*Rural Californian*.

LIBERIAN coffee is being planted in some of the coffee districts of India and Ceylon, and has given much satisfaction, as it resists all the attacks of insects which have destroyed the other varieties. The Tropical Agriculturist of Ceylon refers to a hybrid coffee, which appears to be a cross between the Arabia and Liberian, that was discovered in Brazil some fifteen years ago. It is called the Maragogipe, after a town of that name in Bahia, Brazil. A writer in the above periodical, says of it:

“*The Hybrid Coffee*.—Arabian tree with Liberian blossom appears to have partly set its crops, and I am looking for something to say about it in a few months time. It is a curious and interesting specimen. I enclose a dried blossom of it to compare with the Arabian blossom; both of course are shrivelled up but the comparison holds good. The number of petals in the hybrid are 6, whereas Arabian is I think always 5, and the Liberian 7 to 9.”

What is said regarding the number of petals in the coffee blossom, as a distinguishing mark of different varieties, is worth remembering by coffee growers.

A RECENT number of *Electric Power* describes and illustrates the leading features of the great machinery which has been constructed expressly for the Niagara Falls electric power works. It appears that, owing to the plans of the hydraulic engines, and the special construction of the wheels, it became necessary to design a dynamo that should develop a maximum of 5,000 electric horse-power at their terminals with a fly-wheel effect of at least 1,100 million pounds, and that the revolving parts resting on the shaft should not exceed 82,000 pounds in weight. This dynamo was designed by Professor George Forbes, of London; it differs essentially from any hitherto made, and has answered its purpose admirably. The professor has all the more reason to be proud of his design, as upwards of twenty dynamos had previously been designed, all of which were rejected as

failing to cover the necessary requirements. Prof. Forbes, mentioned in the above, will be remembered as having spent several months here, connected with the transit of Venus party, in 1874.

THE *Louisiana Sugar Planter* of June 13 has some timely remarks on the subject of giving credit for articles copied by other journals. When the practice of reprinting valuable information—editorial or contributed—expressing often new and original ideas of more or less value—with no reference to show the source from whence it emanated, leaving the impression on the mind of the reader that it is original in the offending publication, it deserves no other name than that of *theft*. A lengthy reprint may accidentally appear without credit, and occasionally does in the best regulated establishments, but when several such articles are inserted in the same number, and the offense is often repeated, no excuse can palliate it.

It affords us pleasure to note that our esteemed Louisiana contemporary has extended its circulation to Australia, and received from the Colonial Sugar Refining Company a handsome remittance for several copies of its valuable publication to be sent to its branch refineries and plantations in the British Colonies. It may not be out of place to add that the HAWAIIAN PLANTERS' MONTHLY has been for the past six years supplied by the above prosperous corporation to each of its eight or ten refineries and sugar estates in New South Wales, Queensland and Fiji. Perhaps it is owing in part to the company providing its branches with a full statement of the progress of the sugar industry in Hawaii, that it has become so successful in its colonial field and sugar house operations, having recently divided to its shareholders ten per cent. dividend, and carried forward a reserve balance of over four hundred thousand dollars. If the addition of the *Louisiana Planter* to its list of periodicals, shall assist in like manner to its splendid development of the sugar interest in the colonies named, and to increase its dividends, none will be more pleased with the result than we of this little Republic of Hawaii, who are equally interested in the development of the sugar industry in every other country.

CO-OPERATION AND PROFIT SHARING.

In this issue of the *PLANTERS' MONTHLY* will be found, the report of the Labor Commission appointed by the Hawaiian Government to investigate the various phases of the Labor Question in these islands. Twenty-one topics were named in the instructions given to the commission to investigate and report on. Among these were the following :

- The number and nationality of agricultural laborers in the Republic.
- The rate of wages paid to different nationalities.
- The number and nationality of resident mechanics.
- The rate of wages paid to such mechanics.
- Prices received by Hawaiian planters for their sugars.
- Cost of producing sugars in Hawaii.
- Whether or not more laborers are needed.
- Information regarding co-operative production of sugar, rice, etc.
- Whether such a system is practicable, and on what lines.
- Information regarding co-operation in other countries.
- Whether European or Americans can perform field labor here.
- Whether such laborers can be obtained, and on what terms.
- The effect of Chinese immigration in Hawaii.
- What the effect of restriction of such immigration has been.
- Whether it is advisable to renew such immigration.
- Effect of Japanese immigration.
- Whether it is advisable to renew Japanese immigration.
- Condition of field labor and mechanics in Hawaii.
- Rate of wages paid laborers in other countries.
- Any other information on the labor question.
- Whether contract laborers have come into competition with mechanics, etc., etc.

Thus it will be seen that their investigations were to cover a wide field of research, and seek information on the various phases of the labor question, especially as it affects contract labor and its competition with skilled labor.

The commission has printed seven reports, one of which was given in our July issue, and this number contains another relative to the employment of co-operative labor. It is the most interesting report published by the commission, and shows that the co-operative or sharing system may be introduced to advantage in some places, particularly near large settlements. It will be read with interest by all engaged in sugar, coffee or rice enterprises. Experience will undoubtedly suggest how the present methods may be im-

proved, and adjusted to different localities. It will no doubt be of advantage to employ the laborers of different nationalities, even on one plantation, so as to avoid combines, which are liable to take place, to the injury of the plantation employing them.

The opinion of some planters appears to be that "it is impossible to enter into any contract with parties to plant and cultivate cane on shares, where irrigation is necessary, except where the supply of water is so abundant as to satisfy the needs of both parties." "We can control our work" says another, "much more satisfactorily by having full control of all the labor on the plantation." And again, "the success or failure of the mill department depends largely on the regular and continuous supply of cane during grinding season, and co-operative planters fail to give this."

And yet the experiments that have been made on the Ewa and Onomea plantations show that co-operative assistance has been of material benefit in increasing the crop, and has worked to the entire satisfaction of both the managers and the independent companies of planters. Both these plantations, however, have no scarcity of water.

The commission has evidently had a task before it, in searching for facts bearing on the work assigned to it; and if the remaining reports prove to be as interesting and satisfactory as those that have been printed, it will certainly deserve the thanks of all interested in the very important question what our field labor is to be, and what is the best way to provide and regulate it, so as not to conflict with other industrial interests.

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WHAT TO DO WITH MOLASSES?

This is the subject of a long and exhaustive paper presented by Dr. W. C. Stubbs before the Louisiana Planters Association, and which is published in the *Louisiana Planter* of July 13th.

Dr. Stubbs considers the relative values of molasses as fertilizers, for production of alcohol, as food, and as sugar house fuel. As a fertilizer, the value is calculated upon the analysis of the molasses, giving to nitrogen a value of 15

cents, phosphoric acid of 5 cents, and potash of 5 cents per lb., upon which basis the examples of molasses given by him had a mean value as fertilizers of \$1.63 per ton. As a fertilizer, the molasses of Louisiana has probably a higher value than cane molasses of any other country, which has been explained to us as being due to their higher content of nitrogen, which comes from the circumstance that the Louisiana cane is never mature, and its nitrogenous bodies remain largely in a soluble form and pass on to the molasses in manufacture.

As fuel, Dr. Stubbs presents very careful and elaborate data showing the relative values of molasses and coal. Taking coal, at \$3.50 per ton, as the standard of comparison, by means of very elaborate estimations, the fuel value of molasses was found to be only \$1.31 per ton. These conclusions show us, however, how very much this question is one of locality. On these Islands the cost of coal is \$10 per ton, which at once gives to molasses a value of \$3.75 per ton. Now, in one of our diffusion houses, which has been known to consume (in addition to the bagasse), 25 tons, or \$250 value of coal per day, the value of the molasses would have been equal to \$93.75 per day. Happily, however, (excepting in diffusion houses, which are few and becoming fewer), we do not need to consume molasses as fuel. Our trash is more than enough in well-conducted mills. So that with us molasses has a chief value as fertilizer, although this is not great, and smaller relatively than in Louisiana, apparently; but when we remember that chemical and other fertilizers cost more money here than in the States a relatively higher value is given to molasses for our use.

As food value, the remark made by Col. Schuler in the discussion upon Dr. Stubbs' paper appears to determine that consideration for other countries as well as for Louisiana,—“it would be a loss to us to get it for nothing, with transportation rates.”

As a source of alcohol its value has been demonstrated in most sugar-growing countries. In Louisiana, however, with the great cereal granaries of the world near by, it has had its chance with other materials used in the manufacture of alcohol, and has received little notice. And any altera-

tion of the fiscal conditions attaching to the making of ardent spirits would apply to all materials. If the customs or excise charges were less, alcohol would be cheaper; and molasses would have a proportionably low value for its manufacture.

The effort has been made in our modern processes to recover the fullest available value of the cane in crystalized sugar, leaving the least possible value in the molasses. That has been very far accomplished which is shown by the relative values of centrifugal molasses and the small amount of open kettle molasses that is still made in Louisiana. As this effort progresses yet further, the food and alcohol values of molasses will recede, and this will necessitate the disposing of the article where it is made, partly as cattle feed, or as fuel or fertilizer, which must be determined by local conditions, as we have indicated.

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*THE AUSTRALIAN LADY-BIRDS RECEIVE KIND
NOTICE.*

KAILUA, NORTH KONA, HAWAII,

August 8th, 1895.

EDITOR PLANTERS' MONTHLY:—

Some eight months ago I wrote to you concerning the lady-bird which had been introduced to prey upon our coffee blight, expressing doubts as to its utility, and, until May of the present year, my remarks seemed to hold good, as, up to that time, very few specimens in any stage could be found, and the increase of *Pulvinaria* was simply terrible.

In his reply to the resolutions adopted by the local association on April 5th, Mr. Marsden informed us of the habit of *Cryptolæmus*? taking a winter rest, and some weeks afterwards an increase of the lady-bird was apparent on guavas growing in the vicinity of coffee, on which the original colonies had been liberated, but principally at a point about three miles on the Thurston road at an elevation of about 1000 feet. Spreading from this place they have traveled in all directions, and are now to be found from the beach up to 2000 feet on the mountain side, their distribution having

been materially aided by large quantities of pupæ having been collected and carried to various parts of the district. So far they seem to breed more rapidly at low elevations and show a preference for blight upon any tree but the coffee. It is, however, gratifying to note that, having cleared out the blight on other vegetation, they take to the coffee, as a last resort, and keep on until that too is clean.

The work of *Vedalia Cardinalis* on the cottony cushion scale in California has hitherto been regarded as an exceptional instance of the complete extirmination of an insect pest by a predaceous enemy; and, in a recent letter from the Washington Department, a doubt is expressed as to the wisdom of relying too much in that direction. The work of *Cryptolæmus Monstreus* in the *Pulvinaria psidei* will, however, so far as present indications show, be just as remarkable as that of the *Vedalia* in California, if it remains as industrious as it is at present.

Now that the dreaded White Aphis has been completely exterminated by *Rileyii*, the hopes that *Cryptolæmus* will inflict a similar fate upon *Pulvinaria* is making our Kona coffee planters jubilant and Prof. Koebele, as well as Mr. Marsden, will occupy a warm corner in their hearts.

Yours faithfully,

WILLIAM G. WAIT.

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CONTRACT SIGNED FOR AN OCEAN CABLE.

The last two numbers of the PLANTERS' MONTHLY have had brief references encouraging renewed efforts being made to secure the laying of a cable between Hawaii and the California coast. The time had arrived when the very atmosphere seemed to be charged with electricity, and it needed but a spark to light the current which was awaiting further efforts to send it across the broad waste of ocean water that surrounds our isolated group. For twenty or more years, pioneer adventurers had come hither, prospecting the route, and learning of the soft ocean bottom stretching for two thousand miles from Monterey westward, formed by nature for the very purpose of receiving a cable,—a condition that exists nowhere else in the same degree,—have talked of franchises, and have even secured them. But there the matter

ended, as their projects failed to materialize, and their franchises became waste paper.

Still the air seemed full of electricity, yet no one knew from whence it came, until Col. Zephaniah S. Spalding, one of our own energetic, pushing capitalists, opens his Leyden jar and electrifies the community so completely as to satisfy all that what heretofore has been a myth, may within a few months become a reality, if everything works well, and he meets with as much success elsewhere as he has had here. Suffice it to say, that he has made a contract with the Hawaiian Government to lay a cable between Honolulu and the American coast, within 36 months, for a less subsidy than has been named by any other parties, provided everything works according to plans and expectations. His contract also provides for connecting all the larger islands of this group by cables with Honolulu, these latter to be the property of the Hawaiian Government, on certain conditions, which are quite reasonable.

Everything has now been done by the Hawaiian Government, that is in its power, to secure a prompt construction of a cable connecting Hawaii with the telegraph systems of the new and old world. That the cable business between these islands and other countries will from the start be considerable, there can be no reasonable doubt. And it will surely increase, so that within two or three years at the farthest, the receipts will not only pay the current expenses of the two or three terminal stations, but may leave a surplus for small dividends. The Honolulu station might be in the second floor of the Post-office—a location that would possess several advantages.

Of course the whole project is as yet in an embryo state, and for its successful completion requires the strong aid of the American Government, Congress and capitalists. But the fact that Hawaii has single-handed taken the initiatory step, ought to secure the co-operation of the American Government and people, in such manner and to such an extent as will lead to its success. If such co-operation is promptly made, the cable can readily be constructed and laid over the route within twenty months from that date. When the work is once accomplished by responsible parties, no one

will ever regret the prompt action that has been taken by this government.

The inter-island cable feature of the present concession gives it an advantage over every other application that has been made. This will soon become a source of revenue to the government, and add greatly to the facilities for carrying on business throughout the group. It will tend to bind the islands together in a closer bond of union, and will soon be found indispensable in all business. It should be made a postal telegraph, and probably will be.

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FIJIAN HURRICANES.

The following extracts from the correspondence of the Tropical Agriculturist, presents a rather discouraging picture to adventurers :

FIJI, February 19, 1895.—Fiji has again, on 6th Jan. last, been visited by a disastrous hurricane which has done an immense amount of damage to houses and plantations. The coconut estates to windward have suffered terribly, a great number of trees being blown down and others with their tops twisted off. There will be no copra to speak of for two or three years. This is especially hard on the planters, as their places were only just recovering and bearing after the 1886, 1888, 1889, and 1892 hurricanes. The two we had in 1886 and 1889 were especially strong, but the one we have just experienced, for the time it lasted, for damage done and loss of life, takes I think the palm. To do any good here one ought to plant some product that will give a return between the months of March on to the following December, as the hurricanes occur during January, February, and March. Although it is a very unusual thing to happen, we cannot as yet say we are out of the wood, and may have another blow next month, but I trust we shall be spared. Five hurricanes in ten years is too much of a joke and if it does not mean ruination, it certainly means that no money can be made unless, as stated above, some cultivation is undertaken which will give crops before the hurricane months set in. In this case one would have to face damage done to buildings only.

LABOR AND CO-OPERATION IN HAWAII.

REPORT OF THE HAWAIIAN GOVERNMENT LABOR COMMISSION ON CO-OPERATION AND PROFIT-SHARING.

TO THE EXECUTIVE AND ADVISORY COUNCILS, REPUBLIC OF HAWAII.

GENTLEMEN: The Act, which provides for a Labor Commission, requires it to investigate and report, among other subjects, upon the following:

Section 3, paragraph 8: "The trials which have been given to co-operative production, or profit-sharing, in the production of sugar, rice or other agricultural products in this country, giving, so far as practicable, the details of the several agreements and methods adopted, and the results thereof."

Section 3, paragraph 9: "Whether or not a system of co-operative production or profit-sharing is feasible in connection with the main agricultural industries of the country; and, if so, upon what lines."

Section 3, paragraph 10: "Whether or not such a system of production has ever been adopted in any other country situated similarly to Hawaii, and in the production of similar products to those produced here; and if so, what the results were."

CO-OPERATION.—The Commission understands that "co-operation" is an industrial scheme, in which those who are interested in it, furnished the capital, labor, skill and management required for its prosecution, and share in the profits and losses of the undertaking, that is, a partnership on a large scale, although subject to rules and regulations in the internal management, different from those usually adopted in partnerships composed only of several individuals. In co-operative concerns the management must be, necessarily, in the hands of a few persons, in order to secure efficiency and executive force, but it is subject to the general and final control of the co-partners.

PROFIT-SHARING.—It is understood that profit-sharing is a conduct of business, in which the capital, and usually the larger part of the plant, is furnished by certain persons, and the labor of production is furnished by other persons, who, as a rule, share in the profits, but are not responsible for the losses, inasmuch as they are unable to respond, if there are losses.

PURCHASE SYSTEM.—Another form of industrial alliance is, in the nature of independent contracts, with varied modifications, where the owners or users of capital depend for a supply of raw material, upon the labor and skill of others, who furnish it at a fixed price, or on prices with a sliding scale, instead of furnishing it under a system of daily or monthly wages. This is illustrated by the system of sugar cane growing in Ewa, where the plantation furnishes land, wates, implements, and makes advances on income, but pays a certain stipulated price for the cane. This method does not involve either co-operation or profit sharing, because the cane grower has no interest in the cost of the manufactured article. This contract, in many instances, is termed "piece work."

WAGE SYSTEM NOT SATISFACTORY.—It is generally conceded by planters, on these Islands and elsewhere, that the system of wage paying is the least satisfactory of any of the forms of labor employment, because, as the wages are the same, it does not stimulate the ambition of the laborer, and, indeed, tends to reduce the amount of labor furnished by each laborer to the product of the least efficient, and most thriftless. Whatever arrangement between employer and employee induces the latter to increase his work, and therefore his wages, tends to increase the net income of the former. The making and execution of such an arrangement, involves, at the present time, in all countries, many difficulties, and when the laborer is of an ignorant and unskilled class, the difficulties are greatly increased, and in many cases, almost insurmountable.

The importance of increasing the product of unskilled labor on the sugar plantations, has induced several of the planters to engage in experiments, which might lead not only to a greater product, but would lessen the antagonism

which exists between employer and employee, and would tend to abolish the use of "labor contracts," which involve the penalty of imprisonment.

EXPERIMENTS IN OTHER SYSTEMS.—In Appendix A there is set forth an abstract of the statements made on this subject by planters, in reply to requests made by the Commission.

These replies show that no plantation has ever tried "co-operation," or "profit-sharing," with its laborers, in the true and accepted meaning of those terms. The tendency of the plantation managers is towards the purchase system, with payment according to yield, and market price of sugar. The laborer is paid for his cane, whether the plantation makes a profit or not. The laborer may lose his crop, and receive nothing, while the planter, on the other hand, may make out of his own cultivated fields, a large profit.

In the Ewa Plantation, where much enterprise, intelligence and breadth of view is shown in dealing with the labor question, there is neither co-operation nor profit-sharing. After making deductions, the laborer receives payment at so much per ton for cane brought to maturity. At the same time he is under express supervision and control, and for reasons stated in the labor contract, he may be deprived of his interest in the business. He is not an "independent" contractor. He is, however, paid for his brain as well as manual labor, and is under a stimulus to do his best work. The conditions and terms of the contract, which put limitations, on his independence, are due to the conditions of sugar producing, and are made for the purpose of protecting the plantation against loss, and are in every way reasonable.

On this plantation, the area under cultivation by laborers who sell their cane, is 830 acres, and the area is increasing. The situation of this plantation affords the best opportunity for arrangements of this kind. There is an abundance of water for irrigation, and the land is rich and productive. In a wise development of this system on plantations, where it can be adopted, there may be found a partial solution of the labor problems of the country.

RESULTS OF EXPERIMENTS.—The experience of the planters may be summed up as follows :

That if the soil is rich and water is abundant, satisfactory

contracts for a cane supply may be made with the laborers. If there is a deficiency of either richness of soil or water, the laborer, who is without capital, must fail. He is not in a position to sustain loss or contract any debt.

Therefore, schemes of this kind must be, necessarily, confined to those plantations only which have the requisite qualifications of soil and water.

It may be seen, by reading the abstracts of planters' experiences, that there have been at various times, attempts to establish the "purchase" system, and that some have failed and others succeeded. The reasons for success or failure, are not always stated in the replies received, but they are obvious to those who are familiar with sugar production. The main reasons for failure are those already given here, namely, the deficiency of water for irrigation, and the use of poor soil. No doubt there were other reasons, arising out of incapacity, which presented success, but the failure of the water supply is the most prevalent reason.

LABORER NO PERMANENT RIGHTS.—In all of the experiments now being made, on the "purchase" system, it appears that in no case has the laborer any permanent rights in the soil. He is in the position of a workman in a factory, who is paid by the piece, but has no interest whatever in the plant. In some instances, and perhaps generally the laborers, working on the purchase plan, are permitted to have gardens, but they are not allowed to acquire title to the soil.

They are, therefore, mere tenants at will, liable to be removed at the expiration of the contract.

It is said that it is for the interest of the planters that the desirable laborers should remain permanently. This is true, but there is no provision for the contingencies of business, or the conflicting views of men. In the event of financial failure of the plantation, the laborer is left without a home. So long as he is a tenant life. Only those who understand agriculture, fully appreciate the time required to make even a small space of ground valuable as a home, owing to the slow growth of trees and plants.

DIFFICULTIES OF THE SITUATION.—Nor will the planter be willing to part with any portions of his holdings in land, on any terms which will take it out of his control, unless com-

pelled by legislation or otherwise. On the other hand, a tenant who holds land subject to a contract with the planter to supply him with cane, with regularity, and with payment in proportion to the market rates of sugar, will not be contented to do so, if other and more profitable crops can be raised.

One of the difficulties in the way of securing permanent tenants under the purchase plan is that, in many cases, the plantation management, through selfishness or ignorance, will or may reduce the purchase price of cane to such a point, that the laborer will find little choice between monthly wages and payment under the purchase plan, especially when his land tenure is dependent on the will of the planter.

PURCHASE SYSTEM THE BEST THUS FAR.—In the present condition of the labor supply, and of the plantations, the system of purchase, as carried on at Ewa and at Honomu, is the best that has been devised. Even in these places it would not be practicable if the conditions of water and soil were different. The laborer cannot afford to take any risks, as he is without reserve capital. With fine soil and ample water supply, he is in a position to develop his best work.

From the replies made to the Commission by many of the planters, it is evident that the majority feel that, under existing circumstances, the wage system is the simplest and best. The system is, however, becoming less satisfactory every year in all civilized countries. But any change to a better system depends largely upon the character of the laborers. Here, the employers are of one race, as a rule, while the laborers are of several different races, who can comprehend only the simplest form of service.

NEED OF BETTER SYSTEM.—The planters must feel, in the close competition between the beet and the cane sugar the need of the best and most effective use of manual labor, aside from the use of machinery. They should eagerly look for any better system of labor which will cheapen production. The only hope in that direction, now is, that they will see as employers of labor in the great manufacturing centres now see, the value of brain power, even in the simplest occupations, and that it can be secured only by methods which

appeal to the selfishness of ambition of the laborer. To make any change, however, is not a task which men already pressed with work like to undertake. But plantation managers may see much hope for the future in the Ewa experience.

CO-OPERATIVE AGRICULTURE ELSEWHERE.—The Commission is not aware of the general existence of co-operative plans, in the production of large crops, in any part of the world. It does exist among agriculturists in many countries, but not to an extent which indicates its popularity or probable increase. The share system is very common, but it is confined to the payment of rent by the tenant, who turns over to the landlord certain portions of the crop. This is not co-operation, but a method which enables the tenant to pay according to his receipts, and takes into account the failure or success of seasons. But this method of farm renting is only prevalent in places where the landlords have confidence in the ability and honesty of the tenants, and where the crops are not subject to any further mechanical processes as sugar is.

So rare is there true co-operation in farming that N. P. Gilman, in "Profit-sharing," mention only five cases in Germany where, in agricultural occupations, it has been carried on. Neither in Great Britain or the United States is it regarded favorably, for reasons which will be hereafter stated.

The most successful experiments in agricultural co-operation in the United States, are found in the "Oneida Community," and among the Shakers of New Lebanon, Connecticut. But as these operations are controlled largely by a religious sentiment, they cannot be cited as examples, further than to establish the fact that it is possible for men to unite on a common basis in true co-operation, with signal success in agricultural products. But the vast majority of attempts to achieve success in enterprise of this kind, have been most lamentable failures.

The Commission does not understand that it is directed to furnish a report on the subject of co-operation or profit-sharing in all countries, but rather to make such suggestions as will enable the community residing here and the Government also, to form just and correct opinions on the subject.

CO-OPERATION THE HIGHEST FORM OF INDUSTRIAL DEVELOPMENT.—Successful co-operation is the highest and most desirable form of the development of industrial and personal energy. In all other forms of industrial work the selfishness, cupidity and ambition of men, cause friction which generates disputes and antagonisms. The great difference in the knowledge, thrift, education, skill and ambition of men, creates an intense personal antagonism which prevents co-operation. Even if it is attempted, as it has been in many cases, it generally fails by reason of the existence of these differences.

DIFFERENCES BETWEEN PRODUCTIVE AND DISTRIBUTIVE CO-OPERATION.—RESULTS.—There is an important and great difference between co-operation for distribution and co-operation for production.

There are a number of remarkably great successes in co-operation for distribution in civilized countries. The "Wholesale Society" of Manchester, England, is an illustration of the manner in which co-operation in distribution may be carried to an extent involving many millions of dollars. This society, and others like it, have fortunately secured the services of men of extraordinary ability, who have succeeded where the majority of those who have tried it have failed. These societies, however, have confined themselves to the distribution among consumers of products in a finished state. Where they have attempted to produce or manufacture on the same principle of co-operation, they have usually failed. The societies accepting the principle of co-operation for distribution are not inclined to apply the principle to the manufacture of products, and in many cases, employ workmen at the lowest rate of wages in producing articles for distribution.

While there are a considerable number of associations in productive work in Europe and the United States, it is noticeable that only a small percentage of the business concerns have so far taken that form, and it is also noticeable that only a minority of those called co-operative societies divide all the profits among the wage earners. In the majority of cases wages are paid, and only a percentage of profit is distributed among the workmen.

There have been a few instances, where men of great

executive capacity who have achieved success, have subsequently established true co-operative associations, but these men were philanthropists, and attempted to do that which the common business experience of men does not regard with favor. They have been willing to furnish brain power of great commercial value, and accept little compensation for their work, or have been willing to undertake, with great and unnecessary trouble to themselves, the conduct of co-operative industries, with the hope of benefitting mankind.

It is apparent that true co-operation is impossible, as a rule, so long as those who propose to engage in it, do not recognize the commercial value of brain power, and in the distribution of rewards or compensation, are not willing to give its due share. In business, as in political matters, where a given number of persons engage in any undertaking, with equality in power, the average intelligence governs in the long run. When five hundred men engage in a co-operative undertaking on equal terms, the result represents the general average, which is usually low and entirely unfit for the task of competition with concerns under the control of a single and energetic will power.

The history of the attempts at co-operation show this. Those who desire to obtain the facts upon which these conclusions are based, are referred to the treatises on the subject.

NO TRUE CO-OPERATION HERE.—Therefore, in these Islands with their mixed populations, drawn from the "lower" classes of alien nations and speaking different languages, co-operation in its true sense is at present impossible. That scheme of industrial organization has hardly secured a foothold among the most advanced races, and therefore it cannot be expected to succeed here. Even profit sharing, where the term is strictly used, is hardly adapted to the present industrial conditions of the sugar plantations, because it involves the right of the laborer to inquire into and perhaps have a voice in determining what the correct profits are. Any scheme which permits the laborer to interfere with the management of the business, or to question it, is not desirable under our labor system.

ADVANTAGES OF PURCHASE SYSTEM.—What may be termed

the purchase system is practicable because it is simple and definite and is easily understood by the laborers. It gives them payment for brain work, which cannot, even in the simplest form of human industry, be disconnected from manual labor, and it removes one of the most depressing causes for thriftless labor; that is, uniform wages to the skilled and the unskilled, the honest and the dishonest, the industrious and the lazy.

DISADVANTAGES OF PURCHASE SYSTEM.—The disadvantages of the system, in settling the Island with a desirable population is, that the planter has an unequal advantage over the laborer. He owns the land, controls the water, and can make his own price for the product. While his self-interest may prevent him from driving the laborer off, he still can crowd him with harsh conditions. The intelligent laborer understands this, and will hesitate to settle where he cannot be independent, and where the conditions are not more equal.

PROSPECT OF OBTAINING SETTLERS.—There is, however, a class of tenant farmers in the United States and Europe who will accept the terms offered by the Ewa plantation, provided they could in some way become familiar with the conditions of the industry by actual experience. The Portuguese, Japanese and Chinese are acquainted with the methods of sugarcane cultivation, and are ready to engage in the purchase system. Farmers in the United States are not.

RECOMMENDATIONS.—In the interests of obtaining a desirable population, the Commission recommends that the Government encourage the immigration of a few tenant farmers from the United States and Europe, and place them upon such plantations as may desire to extend the purchase system. If such immigrants were introduced to the extent of fifty or more families, either with or without Government aid, the experience obtained in the securing and placing them upon the plantations would enable the Government to decide how far it would be practicable to encourage further immigration of this kind.

Moreover, it might result in an adjustment of the relations of the planter to the tenant farmer which would obviate the drawbacks connected with that kind of labor. It can-

not be expected that desirable settlers will, as a class, remain long as tenant farmers. The majority of them would gradually seek for fee simple homesteads. But a sufficient number of them might remain to affect favorably the labor system on the plantations.

What has been especially needed, and is now needed, is experience, which will indicate better than any speculations the best course to pursue in solving the labor problem. The experiments made with Germans and Norwegians on several plantations is wholly inconclusive, because there was no effort to apply the principles of cane purchase, nor was the proper care taken and the proper discrimination exercised, in some cases at least, to secure the class who would be most likely to meet the indications above described. The desirable immigrant for our purposes is not to be recruited in seaport towns, nor found in cities. The agent employed to attend to this business must strike out into the country and come directly in contact with the small farmer and moderately independent proprietor who possesses the needed qualifications, industrial, pecuniary and moral. The experiment should be made at once and exhaustively, with American laborers, as it now works successfully with the Portuguese, the Chinese and the Japanese at Ewa. The amounts paid to these people show that the purchase system, if not abandoned through causes now unforeseen, will pay even the American farmer better than the staple crops of the United States now pay.

In the present depressed condition of the sugar industry, neither the Government nor the planters can engage in any expensive experiments. But enough can and ought to be done to secure information and experience on the subject.

All of which is respectfully submitted.

WM. N. ARMSTRONG, Chairman.

JOHN EMMELUTH,

J. M. VIVAS,

T. B. MURRAY.

H. W. SEVERANCE.

APPENDIX, CONTAINING LETTERS, REPORTS, EXTRACTS AND MEMORANDA OF VARIOUS KINDS RELATING TO CO-OPERATION AND PROFIT-SHARING.

(From the Manager of the Ewa Plantation Company.)

HONOULIULI, OAHU, December 18, 1894.

C. T. RODGERS, Esq., *Sec'y Labor Commission, Honolulu:*

DEAR SIR:—In reply to your communication regarding co-operative production, we have had the system under trial for nearly three years, and have come to the conclusion that it benefits the employer and the laborer.

We believe that the extra care bestowed upon the cane gives results which amply repay us for any apparent high rate of wages paid to the planters.

We send you herewith a copy of the latest form of contract, which will explain to you fully the terms under which the profit-sharing companies cultivate our cane.

In the year 1892, three companies, consisting of Portuguese, Japanese and Chinamen respectively, contracted to cultivate in all 319 acres. These were paid according to the sugar returns, receiving one-fifth part of the net proceeds in Honolulu. They also had the advantage of entering into the contract after the cane had been growing some little time. The terms were thus made specially advantageous to the planter as an inducement to commence the system, added to which the high prices prevailing at the time the crop was taken off gave them results which were in every way satisfactory to them.

In the following year (1893) two new companies were formed, one of Chinamen, the other of Japanese, with 95 and 131 acres respectively. The former were charged \$6 per acre for extra labor required for cutting and loading seed, planting and first watering, making level ditches and putting in gates and boxes; and received as payment \$1.20 per ton of cane (2000 pounds). The Japanese were charged \$9 per acre for the same extra labor and were paid \$1.25 per ton of cane.

Satisfactory work was done by both companies, and the results were again favorable to the planters.

In the Chinese company each man received on an average at settlement a sum of \$226.09, in addition to the advance of \$10 per month. This represented an average of \$25 per month for each man on actual time worked.

The Japanese averaged \$144.19 at cash settlement, and \$19.61 for each month worked.

At the present time we have eight profit-sharing companies in operation, three consisting of Chinamen and the remainder Japanese, cultivating in all 830 acres. No charges have been made against these companies for cost of planting. They took charge of the field after the first watering, and will receive payment on the cane at the rate of \$1 per ton. The cane from three of these will be taken off in the next crop.

For further details we beg to refer you to the copy of the contract, although we shall be glad to answer any further questions which you may feel inclined to place before us.

Yours very truly,

W. J. LOWRIE,

Manager Ewa Plantation Company.

Copy of form of agreement entered into between the Ewa Plantation and parties who cultivate cane on their own account on plantation lands.

This agreement, made this.....day of.....189... by and between the Ewa Plantation Company, a corporation, of the first part, hereinafter called the Employer, and..... of the second part hereinafter called the Planter. Witnesseth:

That in consideration of the premises, terms and covenants herein below set forth from either party to the other moving, the said Employer does hereby promise, covenant and agree to admit the Planter as an agricultural laborer and share planter upon the Ewa Plantation, at Honouliuli, on the Island of Oahu, and in the furtherance of said object does hereby agree :

1. To give to the said above named Planter for cultivation on the profit-sharing system, as herein below set forthof that section of land now plowed, fur-

rowed and planted with sugar cane on the Ewa Plantation amounting to about.....acres, and described in plantation map as follows:..... and also to advance not to exceed.....dollars (\$.....) for each month of such service for food and other necessary uses of the Planter, which amount shall be returned by the Planter without interest as hereinafter set forth.

2. The Employer agrees to furnish without charge, lodging sufficient for the Planter, and also fuel for domestic use, which shall be cut and gathered by said Planter for himself at such place as the Employer shall designate; also tools for irrigating purposes shall be furnished in the first instance; after that, all tools shall be furnished by the Planter; also water in the main plantation ditches for irrigation, but taking water therefrom to the cane fields shall be done by the Planter; and the water so furnished shall be used economically and without waste for each irrigation. Also, to place movable tracks through the fields at a distance of not over four hundred (400) feet apart.

And the Planter, on his own behalf, covenants and agrees, in consideration aforesaid, to go to the Ewa Plantation, on the Island of Oahu, and there to labor in accordance with the terms of this agreement, to wit:

3. With such other Planters as may be designated by the Employer to irrigate and cultivate in the best manner to maturity the land set forth in Section 1, and, when so required by the Employer, to cut and deliver the cane to be so cultivated upon the cars on the main track of the Employer whenever deemed necessary by the Employer. In cutting, it shall be cut close to the ground and topped clean, and care shall be taken not to load any dead or sour cane upon the cars, and all unsound cane so loaded shall be separated at the cane carrier, weighed and deducted from the sound cane, and all expenses connected with separating and weighing such unsound cane, shall be charged to and deducted from the Planter's share. All of the cane to be stripped at least *twice*, and in heavy places *three times*, whenever so directed by the Employer; and all roads and ditches running through said fields to be kept clean and free from weeds.

4. It is likewise hereby agreed that all work, labor and

service to be performed by the Planter under this agreement shall be subject to the supervision, and shall be done to the satisfaction of the Employer in all cases: and if it shall seem necessary to employ extra labor to do the work satisfactorily, the Employer shall so employ extra labor, and all cost of same shall be charged to and deducted from Planter's share with interest at the rate of nine per cent. per annum, and the Planter shall always be subject to the supervision or order of the Employer.

5. For all labor performed under the terms of this agreement in cultivating and harvesting cane upon the land set off to said Planter, he shall be paid at the rate of.....per ton of two thousand (2000) pounds of cane on all of the cane, subject to conditions of Article 3, produced upon the land cultivated by himself in common with others as aforesaid, such proportionate part as his labor bears to the entire amount of labor expended upon such premises by the Planters, averaging the same between the total number of such Planters.

6. From the proceeds of his labor, as set forth in the last Article, he shall return to the Employer the advances set forth in Article 1, aforesaid, as therein set forth.

7. This agreement may be terminated at any time by the Employer, and upon two months' notice by the Planter, the Planter being entitled upon such settlement, to wages at the rate of.....dollars per month for the term of his service rendered, deducting therefrom the advances as aforesaid under Article 1.

8. In case of the death of the Planter during the term of this agreement, the estate shall be entitled to an immediate settlement at the rate of.....dollars(\$.....) per month deducting advances as aforesaid; or settlement may be deferred until the crop is harvested, and then it shall be made upon the terms hereof for the proportionate time given by said Planter hereunder. In case of accident to or sickness of said Planter whereby he is prevented from performing the labor under this agreement, if he shall not supply labor in place of his own, the Employer shall do so, and a proportionate amount of said Planter's share under this agreement shall be deducted for the time lost.

9. The Planter, together with his co-workers, shall have the right to inspect the weighing of their cane at any time.

10. The Planter shall not have the right to transfer or assign his share to another without the written consent of the Employer, and in case of any such transfer it shall not be reconized, and all settlements shall be made with the original Planter or his heirs or legal representatives in case of death.

11. The Employer shall in no way be held liable for damages to said crop or any portion thereof by storms or for unavoidable delays in the Mill.

12. This agreement shall terminate and be at an end when the last cane upon the fields to be cultivated hereunder shall have been placed upon the cars and weighed, and settlement shall be made in full not later than one month thereafter.

In witness thereof, the said Employer has caused the execution of these presents by the attachment of its corporate seal together with the names and seals of its President and Treasurer, and the said Planter has hereunto set his hand and seal the day and year first aforesaid.

(Signature of Planter.)

EWA PLANTATION CO.,

By its President.

EWA PLANTATION CO.,

By its Treasurer.

(From the Manager of the Honomu Sugar Co.)

HONOMU, December 12th, 1894.

MR. C. T. RODGERS, *Secretary Labor Commission, Honolulu.*

DEAR SIR:—For answer to the questions propounded in your No. 4 and 5 Memoranda, I enclose a copy of our blanks used in a system now five or six years in successful operation on this place.

About half of our sugar is grown upon this plan.

Price per clarifier of juice ranges from four to ten dollars, according as the ground is poor or good, convenient or otherwise to flume, plant or ratoon; and also as to whether we or they do the planting or cane cutting.

I consider this method with us has long since passed the experimental stage.

Very truly yours,
WILLIAM KINNEY,
Manager Honomu Sugar Co.

The following memorandum was received separately: "Tracts of forty or fifty acres are given out. Companies generally range from eight to ten men. These buy and sell their shares, but the company remains."

Copy of form of agreement entered into between the Honomu Sugar Co. and parties who cultivate cane on their own account on plantation lands.

CO-OPERATIVE AGREEMENT.

Between the HONOMU SUGAR COMPANY and.....
.....
with his associates.

The HONOMU SUGAR COMPANY agree to let out to.....
.....acres of cane land for the purpose of growing a crop of cane, to be harvested in.....
.....besides furnishing them with sufficient pali land for gardens, and wood land for fuel. The Honomu Sugar Company further agree to plow and prepare the field for planting. and to furnish the usual quantity of fertilizer on the ground, free of charge. Also, to allow.....
seed where it is grown, free of charge. Also, to build and shift flumes on the customary lines, paying to.....
at the rate of.....per clarifier of juice, such clarifiers as now used in Honomu boiling house.

The HONOMU SUGAR COMPANY further agree to advance on account, from month to month, at the rate of ten dollars for each full month of twenty-six days performed by each member of the camp. to be deducted without interest on settlement, which shall be immediately upon the end of harvesting.....for their part agree to provide themselves with quarters, and also with tools, implements and animals.

THEY AGREE to gather seed, plant the same, and to care for the growth to maturity, always keeping the ground free

from weeds and trashing when required, and finally to cut and deliver the crop alongside of flume.

AS TO RATOONS, plowing by the Honomu Sugar Company, and planting by.....do not apply, but in all other things this agreement is the same as in plant.

IT IS MUTUALLY UNDERSTOOD that should..... and his associates, neglect their fields so as to injure the crop, or threaten loss to the Honomu Sugar Company. the latter may withhold advances and take possession..... to withdraw, and give up without demur or recourse to any demand for damages or additional pay.

Copy of form of agreement entered into between the Lihue Plantation and parties who cultivate cane on their own account on plantation lands.

This agreement, made this 14th day of August, 1894, between the Lihue Plantation Company, Ltd., party of the first part, and the undersigned Japanese, party of the second part, Witnesseth :

That the party of the second part agrees that they will properly dig out and bring to the surface from a depth of at least two feet all stone of an area of say two hundred acres of makai land at Ahukini, belonging to the party of the first part, in such a manner that the said two hundred acres can be plowed afterwards by a steam plow, and

Wherefore the party of the first part binds itself to pay \$50 per acre to the party of the second part, as soon as a part of say 50 acres is so cleared of all stones (that is from a depth of at least 2 feet) the party of the first part will pay in full for that.

Furthermore, the party of the second part shall have the right to cultivate in cane all the land so cleared for 5 crops of cane.

The party of the first part does promise and agree with the party of the second part to furnish the houses for the men; the tools for digging and the necessary giant powder (intended to blast all stones of such a size that two men cannot handle), and also to pay each man \$6 per month for his living if they guarantee for their work.

The party of the second part also promises and agrees with the party of the first part that there shall be at work on every working day 30 men, excepted only that a man should be sick and can prove this by a written certificate of a physician.

It is understood that the party of the second part will employ no men that have been or are working on the Lihue Plantation under penalty of rendering this agreement null and void.

It is also agreed that the laborers shall work on the Lihue Plantation whenever required to.

It is furthermore agreed.

First.—That the Lihue Plantation will do all the plowing, furrowing and manuring on said land.

Second.—That the Lihue Plantation will do the necessary planting and furnish to the party of the second part enough water to irrigate the said field through in 10 days.

Third.—The Lihue Plantation agrees to pay to the party of the second part \$7 for each ton of sugar gained from the cane so raised.

Fourth.—The Lihue Plantation does the transporting and the loading of the cane.

Fifth.—The Lihue Plantation agrees to take all the cane off between the 1st of October and the 15th of February.

Sixth.—The party of the second part agrees to *well keep clean* the field from weeds; to strip the cane well at least three times each crop to cut the cane, and the cane so cut shall not remain on the land longer than 48 hours.

For the purpose of hoeing, the Lihue Plantation Co. agrees to furnish the necessary hoes to the party of the second part.

This agreement, is signed by both parties in presence of the following witnesses :

(Signed)

LIHUE PLANTATION CO.,

C. WOLTERS, *Manager.*

(Witnesses :)

R. KARVADA,

D. TUNKAI.

Under date of December 12th, 1894, the manager of the above plantation writes as follows :

• "In reply to your yesterday's favor, I beg to say that the

Lihue Plantation has made contracts with two parties of Japanese, copy of which I enclose herewith. In both cases some intelligent Jap has made the contract. I do not know how they settle with their laborers. One party has been working for five months now, clearing a 100 acre lot, and I hope to put the same into cane next summer. So far I am pleased with their work. I pay them \$7 per ton of sugar because they do not load the cane, as is the case in other places."

(From the General Manager of the Colonial Sugar Refining Company to Mr. Geo. Cavanaugh of Honolulu, and handed by the latter to the Labor Commission.)

COLONIAL SUGAR REFINING COMPANY, LD.,
OFFICES O'CONNELL STREET,
SYDNEY, 19th October, 1894.

G. CAVANAUGH, ESQ., HONOLULU. DEAR SIR:—I am in receipt of your letter of 24th ult. and would state that this company's mills in New South Wales are worked in just the same manner now as at the time you mention. The cane is grown by the farmers, is purchased by the company on the ground, and the whole of the cost of carting and moving the cane to the mill is borne by the company.

As to the rate of wages, I may say that the minimum is £1 a week with board and lodging, and that the men employed on piece work earn from 30s. to 50s. a week and found; while the pay of sugar boilers and mechanics ranges from £2 15 to £3 10 per week with board, etc.

The mills are run night and day, and the men employed in the factory work by day one week and by night the next; the hours of duty being 10 per day, with one break for dinner.

I am, yours truly,

EDWARD W. KNOX,
General Manager.

(From the General Manager of the Colonial Sugar Refining Company to the Labor Commission, in answer to inquiries contained in the letter of the latter dated Nov. 26, 1894)

COLONIAL SUGAR REFINING COMPANY, LD.,
OFFICES O'CONNELL STREET,
SYDNEY, AUS., January 8, 1895.

THE SECRETARY, *Office of Labor Commission, Honolulu.*

DEAR SIR :—With reference to your letter of 26th November, and in reply to the questions therein contained, I have to make the following remarks :

This company, besides being interested in the manufacture of sugar, in three factories in New South Wales, has three large mills in Queensland and four in Fiji. The total production during the season just ending has been 60,000 long tons. The cane is grown under different conditions in each of these colonies; that in Fiji being produced chiefly on estates owned and worked by ourselves; while in Queensland and New South Wales almost the whole of our supply is derived from crops grown by small farmers. In New South Wales the whole of the work is done by men of European birth or descent—no colored labor at all being employed, this being possible because the local producer is protected by a duty from the competition of manufacturers elsewhere. In Queensland the mill work is to a great extent done by white men, but in the cultivation South Sea Islanders and some Japanese are employed, though during the last two years a good deal of the cane has been cut by Europeans.

In Fiji this work is all done by East India coolies introduced by the government of the colony under arrangement with the East Indian Government.

In New South Wales much of the cane stands for two years, being planted in the spring and taken off about the same time two years later; a proportion of the crops, however, mainly ratoons, are cut when between 12 and 14 months old. In Queensland and Fiji the average age of the plant cane when cut is about 16-18 months, and of the ratoons 10-14 months. The yield varies so greatly in the different

districts that it is not easy to give an average that would fairly represent the production of sugar per acre, and in any such return allowance would have to be made for the varying ages of the cane. I may say, however, that the entire crop of Australia and Fiji, for the season just ended, has reached about 140,000 tons; and we expect during the present year that the output will be 170,000 tons.

The farmers who grow cane for us receive advances ranging up to £6 an acre according to the age and condition of their crops, in some cases without interest, while in others interest at the rate of 6 per cent per annum is charged. They are always paid in cash on delivery of the canes.

Trusting that the above information will be of use to you, and which I shall be pleased to supplement should you so desire.

I remain, yours faithfully,

EDWARD W. KNOX,
General Manager.

(Memorandum received from Mr. Emmeluth on the subject of planting in New South Wales.)

THE COLONIAL SUGAR REFINING COMPANY,

HEADQUARTERS SYDNEY, *General Manager, E. W. Knox.*

“On the Clarence, Richmond and Tweed rivers, farmers generally put half their land in cane and other crops in the remaining half. The Sugar company gives agreements and guarantees 10s. (\$2.50) per ton for the green cane, clear of an expense to the farmer.

“White men do all the work in field, mill, etc. See letter account of wages they make.

“The company will, when necessary, pay the farmer \$30 per acre every crop for the expense of labor, to be deducted afterwards.”

(Extract from letter of the Manager of the Hakalau Plantation Company, dated December 12, 1894.)

HAKALAU PLANTATION COMPANY,

HAKALAU HAWAII, December 12, 1894.

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

DEAR SIR:—“In regard to Memo. No. 5, I would state, that

during the early part of the present year I offered to purchase cane grown by outside parties on their own land, at the rate of \$3.50 per ton of cane, when the basis of 96 per cent. polarization was $3\frac{1}{2}$ cents per pound in New York, increasing or decreasing in a corresponding ratio; cane to be delivered within a reasonable distance of the plantation flumes. The offer was taken advantage of by Chinamen only, who leased small pieces of land from native owners, for the purpose of planting cane upon the conditions offered. There is at present an aggregate of 25 acres being grown in this way. I consider the system of buying the cane outright at so much per ton according to market price of sugar as the most satisfactory, and it is also the system most generally practiced throughout all sugar growing countries.

“About five years ago a tract of about 50 acres of the plantation land was being cultivated for cane by Chinese, they receiving 11-16 of the sugar. They failed after a trial of three to four years to make it a financial success for themselves, and they voluntarily abandoned the undertaking.”

Yours respectfully,

GEORGE ROSS,

Manager Hakalau Plantation Co.

(Extracts from letter of John M. Horner, Kukaiau, Hawaii, dated December 17th, 1894.)

KUKAIAU, December 17th, 1894.

LABOR COMMISSION. *Honolulu.*

DEAR SIRS:—“My views respecting profit-sharing cane raising on this Islands are unfavorable to it, even as a partial solution of our labor problem, or even profitable for the plantations.

“Believing, as I do, that it will require more laborers to do the same work, if the lands now cultivated by the plantations were divided up into small holdings and worked on shares, for the reason that but few such small operatives would have means to work to advantage as the plantations have, hence less would be effected than the same labor now performed. That is, the ordinary small holder would do more by working under the wise direction of a practical plantation man than

by working under his own dictation, because his plans, his manner of working would be inferior, and in consequence less would be effected by him and by all his help. In most cases they would require a horse or horses, as the case may be, and but few of such small holders know how to use a team to advantage, or to instruct others how to use them.

"The same may be said of plantation implements; but few know how to use them. All these must have roads and living quarters, with yards and gardens on or near his cultivation. Besides all, or most of these, would have to be supplied with money, or its equivalent, and this would have to be done by the plantation owners, who would not relish placing money into the hands of a dozen or more unskilled, irresponsible persons. * * * *

"I can imagine, if the Hamakua and Hilo railroad was built, mill owners could join in profit-sharing with parties occupying lands near the road, but not convenient for the plantation to cultivate direct, and no doubt parties occupying small pieces of cane land adjoining Hilo and near Waiakea Mill, could join with the mill owners in profit-sharing to advantage; but in all these cases it will require more labor instead of less. The above is not intended to include contract work, where individuals are given so much money to clear a piece of land, strip, cut cane, etc."

Most respectfully,

(Signed)

JOHN M. HORNER.

(Extract from letter of Manager of the Pioneer Mill, Lahaina, Maui, dated December 20th, 1893.)

LAHAINA, MAUI, December 20th, 1894.

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

DEAR SIR: "In regard to the co-operative or profit-sharing system, it would be impossible to carry on such a system here, as during the dry months the water is so low here that there would be no end of trouble."

We remain, dear sir, yours very truly,

FOR PIONEER MILL AND OWNERS.

WOLTER.

(Memoranda from the Onomea Sugar Co. in answer to questions propounded by the Labor Commission.)

The Onomea Sugar Company manufactures sugar for outside parties on the following terms :

All cane grown on land owned by outsiders, 2-3 of the net proceeds of the sugar.

The Planter is furnished with seed free of charge, the planting and cultivation and the cutting and delivery of the cane at the flumes is at the expense of the Planter, but the Onomea Sugar Company assists with labor of men and animals, if requested to do so by the Planter, the expense of such assistance being charged up as advances on the crop to be deducted from the Planter's share of the proceeds of the crop.

The Onomea Sugar Company builds and maintains the necessary flumes and flumes the cane to the mills at its own expense.

The "net proceeds" is understood to mean under the contracts:

The gross amount for which the sugar is sold in San Francisco:

Less freight from Papaikou to San Francisco.....	
Less Agent's commissions.....	
Less polarization and weighing charges.....	
Less cost of bags.....	

Under these terms the Planters have made money.

Estimated yield of cane cultivated as above for the crop of 1895 is 320 tons.

There are many places on this plantation where the soil is rich, but so steep that plows and other implements drawn by mules cannot be used. Any one who wishes is allowed the use of these places free of rent or other charges. Seed cane is furnished them free of charge, and the cane when ripe, is cut, weighed and delivered at the flumes and mill and ground free of any charge to the Planters for manufacture or bags or marketing expenses.

After receipt of account sales of the sugar manufactured from the cane, the Planters are paid a certain rate per ton

of cane. the intention being to make the amount realized by the Planters equal to the $\frac{2}{3}$ share of the net proceeds that would be paid to them if they were cultivating the cane under contracts explained in folio 1. The Planters who have been raising cane in this way have made money and seem pleased with the results.

There are a great many small fields in the ravines and on side hills, and it is almost impossible to estimate the yields.

The expense of harvesting the cane in these places is very great, but the yields of cane are heavy.

Price per ton of cane crop of 1893.....	\$3 50
Price per ton of cane crop of 1894.....	3 00

During the last nine years there have been twelve attempts to solve the labor problem on this place by making contracts for cultivation of cane; some of the contracts have been made with individuals and others with companies of men who have co-operated and shared alike in the profits or losses.

The position of the Onomea Sugar Company in these transactions has not been that of profit-sharer or co-operator with the men doing the actual labor of cultivation. The element of co-operation enters into the arrangements between the men themselves only, and it seems to me that the so-called "Ewa system," and other contracts of the same kind, are not profit-sharing" or "co-operative," but cultivation contracts pure and simple, in so far as the sugar company is connected with them.

NINE YEARS' EXPERIMENTS.—F. Cook, 150 acres, cultivation contract, failure.

Wang How, 115 acres, cultivation contract, failure.

Wang How, 200 acres, cultivation contract, failure.

Wong How, 71 acres, cultivation contract, success.

J. Devereaux, 100 acres, cultivation contract, success.

(Contract provided for a bonus to the contractor if yield should exceed a certain amount, and forfeiture for shortage in yield. Contractor was paid a bonus).

P. N. Apana, 250 acres, cultivation contract, failure.

(This contract was sub-let to the men who did the work by Apana, and the result was loss to all concerned).

D. Kamai, 60 acres, cultivation contract. failure.

(Contract was sub-let by Kamai).

Japanese Co., 115 acres, certain price to be paid per ton of cane.

CO-OPERATIVE WORK.

Japanese Co.....	58 acres.....	Co-operative
Japanese Co.....	40 "	"
Japanese Co.....	50 "	"
Japanese Co.....	30 "	"

Some of the above Japanese contracts mature during the next six months, and the prospects are good for success to the laborers and to the Onomea Sugar Co. also.

My plan is to make other contracts like those already made with the Japanese, or if the right man can be found, like the contract made with J. Devereaux, which was in every way satisfactory.

If anything is to be done that will make radical changes in our labor system, men with some capital should be encouraged to come here, as any attempt on the part of the plantation owners to co-operate with men who are both impecunious and unthrifty, will result in loss. It will not be "profit-sharing" or "co-operation" if the risks are all taken by the land and mill owners and all losses borne by them.

The Portuguese, I think, are well adapted to the raising of sugar cane on small farms, and in this section there are a number of homesteads that have been planted, and others are being cleared for the same purpose. Every encouragement is given to men on this plantation to go into the business of raising cane on shares or otherwise.

WILLIAM W. GOODALE,
Manager Onomea Sugar Company.

(From an article by J. M. Ludlow in the Atlantic Monthly of January last.)

"The history of co-operative production in Great Britain dates from the end of the last century and was first established for corn milling, and was successful and lasted a whole century. The Sheerness Economical Co. began busi-

ness in 1816, and is still in operation. The following industries are embraced in the co-operative system ; manufacture of boots, soap works, leather currying, woolen goods, biscuit factory, cocoa works, ready made clothing, printing works, preserved meats and fruits, tobacco cutting, etc.

“In 1893, there were in operation one hundred and nine societies, with sales amounting to £1,292,550, with profits varying from £8,917 to £64,679.”

(Extracts from a letter of Gay and Robinson, Makaweli, Kauai.)

“We have never done any work on this system, and must admit that we have never given it much consideration ; but at present would say we do not think it likely to be successful in most parts of these Islands, particularly on account of the lack of a sufficient class of working population. But in a thickly populated district, where the laborer has other means of support, we think the system might be fairly practicable.”

(The following is from a Plantation Manager whose name the Commission has not the permission to use.)

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

DEAR SIR: “This plantation was commenced with co-operative planting and milling. About 12 prominent natives being the planters. Some of them very soon sold out their interests. These planters had for their shares 9-16 of sugar made ; they had to grow and deliver cane to the mill. The plantation, or rather Mr. ———, supplied funds for the native planters, and after the first few years work, put up flumes for each and all of them. Under the favorable circumstances of new land and high prices of sugar, these planters failed. Co-operation by men of small means and large families has been considered, the difficulties and risks prevented any action being taken.

“The success or failure of milling department depends largely on the regular and continuous supply of cane during grinding season, and planters failed to give this.

“If cane growing and sugar making is to be continued, work will have to be done cheaper and better, and yields per

acre increased by fertilizing or otherwise. Unfortunately, there appears to be no prospect of good prices in the near future, with beet root growing on the increase and overstocked markets.

"I would like to say, that the large yields we hear of and read about are not average yields, but come from irrigated alluvial lands, and the cost of this irrigation is large. We do not hear much about small yields from wind blown hills, but we see something of it to our discouragement."

(From the Manager of the Olowalu Sugar Co.)

OLOWALU, MAUI, DEC. 10th, 1894.

To the Secretary of the Labor Commission.

DEAR SIR:—No co-operative production has ever been tried on this plantation. Although I would like to try the co-operative system, I think it hardly would work well on this plantation as our water supply is very limited, and I am afraid there would be a constant fight amongst the planters about water. But I don't see any difficulty why the co-operative system should not work well on other plantations where they have abundance of water, or plantations in the rainy districts like Hamakua and Hilo, on Hawaii.

I remain, sir,

Yours very respectfully,

AUGUST HANEBERG,

Manager.

(From the Manager of Paaunahu Plantation Co., Hawaii.)

PAAUHAU PLANTATION COMPANY,

HAMAKUA, HAWAII, H. I., Dec. 7th, 1894.

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

DEAR SIR:—In reply to Memo. No. 5, will say that for 3 or 4 years ending six years ago, we contracted the cultivation of our cane to Chinese under the following arrangement:

The plantation planted the land, after which it was taken charge of by a number of Chinese, who agreed to hoe, cultivate and strip the cane three times for \$34.00 per acre.

Payments were made monthly at less than ruling rates, and only for the men actually worked during the month. Thus a balance accumulated, which could be used to pay for plantation men were it necessary to use them in assisting the Chinese at any time. It was necessary to place a special luna to oversee the work.

The reason for contracting our work at that time was the scarcity of labor in the country. We bound a certain number of men under each agreement as the fields were divided, and from 200 to 300 acres being given to each gang. The Chinese could draw Chinese from other plantations, to assist them, where it would not be policy, if practicable, for plantations to raise wages to attract men.

The arrangement was never a satisfactory one, and as soon as the supply of laborers was easier, I discontinued the contract system. The price paid, \$34.00 per acre, was fair for both plantation and the men. We can control our work much more satisfactorily by having entire control of all our labor. At many times details of plantation work may fall behind, and although the agreements may have arranged for the working of the contract men on other than their particular fields, still they could not be depended on.

I do not think any class of labor would do better than Chinese or Japanese for the profit-sharing system. Europeans would certainly be less easily controlled.

I worked contract Norwegians at Spreckelsville ten or twelve years ago, who were most unsatisfactory for general plantation work, because they were too highly educated. As painters, engineers, lunas, etc., and for special work, and for which they received more than contract wages, they proved to be good men.

The experience with contract Germans was also very unsatisfactory. I had no personal experience with them, but remember constant troubles at Ookala plantation while Mr. Soper was in charge, who may be able to give you some details.

Portuguese are the best laborers we have as all round men, but very costly, on account of the large families to be housed and supplied with wood and water and medical attendance.

Japanese and Chinese fill the bill in every respect, and I think these can be engaged to work at agricultural work only.

If the Portuguese families worked as they grew to be old enough, it would not be so bad; but as they are educated (compulsory) in this country above the sphere in which their ancestors had lived, menial work and they do not agree; so they usually drift to America, their fathers having saved a few dollars in the meantime, accompanying their educated sons.

Profit-sharing would not work during our dry season, and capitalists would not be likely to support a number of families, besides losing on the short quantity of cane.

I am afraid I have written too much on a subject I know so little about. We get along so nicely with our labor under the present arrangement, and if possible should like it continued.

Yours very respectfully,

A. MOORE.

(From the Manager of the Paia Plantation Company.)

SUPERINTENDENT'S OFFICE, PAIA PLANTATION,

PAIA, MAUI, December 7th, 1894.

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

DEAR SIR:—In reply to your Memorandum No. 5, I beg to say that many years ago, I believe, co-operative production was tried on this plantation, but was given up. What the exact terms, etc., were, I was not informed.

Under certain conditions I have no objections to co-operative production or profit-sharing, but I do not think it would be practicable on this plantation, on account of the necessary irrigation and the unreliability of our water supply. Where we have a full ditch, the distribution of the water would be easy enough; but when the ditch falls from 11 inches to 2, and stays there for months, as it did last summer, I do not think it possible for either party to get satisfaction. Under present conditions, with a low ditch, I of course, put the water on where it is most needed; but with a colony of small planters, I think this would be a hard task; each thinking that his cane needed water the most.

On plantations where no irrigation is required, or where

there is a steady supply of water, I think that co-operative production is both practicable and profitable.

Faithfully yours,

J. W. COLVILLE,

PER LINDSAY.

[The author of the following letter, who is at present in the Government service, is known to many persons in Honolulu as a reliable man as well as an intelligent and careful observer. His testimony goes to show, what is also apparent from other well known facts, that under the ordinary wage-paying system the laborer does not do his best work, either in quantity or quality. This is abundantly proved by the fact that under the system in operation at Ewa and elsewhere, the laborer makes from fifty to one hundred per cent more than when receiving wages, while the plantation is also admittedly the gainer.]

HONOLULU, H. I., January 1st, 1895.

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

DEAR SIR:—In response to the request contained in your communication of the 29th ult., for a statement reciting what conclusions I am led to from personal experience and observation regarding the labor and outfit required for the cultivation of sugar cane, I subjoin the following.

My personal experience covers a period from Nov., 1877, to May, 1882, in the district of Kau, Hawaii, near Pahala.

I remember a conversation the writer had with you, whereat he stated that with seven men he could cultivate and bring to maturity 100 acres of sugar cane, where the rainfall was sufficient to render irrigation unnecessary. I now reiterate the same and will endeavor more fully to elucidate the method of procedure.

Having 100 acres of suitable land free from brush, say about five months before the time of planting, I would begin the first plowing with two teams and two men, turning over two or more acres per day, according to the condition of the soil, after which harrowing well the land and giving it a second plowing: when finished, I would then get 5 more men (making the complement of seven) and while the teams were

giving the land another thorough harrowing, would build a fence, cut seed cane and put in piles in convenient places, cover with grass and bank with earth, so as to exclude the air, causing the dormant eyes on buds to swell and be in a fine condition to plant. Furrow out for planting, say 5 feet apart, and at the time of planting run a plow once again through the furrow, and put the seed in the newly exposed moist soil, pitching them in so that they will be placed about end to end, cover slightly with earth, by firming with the foot.

Planting should commence at the mauka side or the highest elevation. After planting wage incessant war upon all weeds and grasses, they are the indefatigable enemy of the planter, and should not be permitted to make any headway, the old adage, "a stitch in time saves nine," is very applicable in this connection; also "the mighty oaks from little acorns grow" is an illustration of the possibilities of small and comparatively insignificant things.

Begin at once now cultivating with two one-horse implements one-half day for each horse and continue their use, together with hoes among the cane until the growth of the latter is so great as to preclude the possibility of their further use.

Stripping once or perhaps twice I would deem sufficient.

Thus, with two men only, for nearly five months, and thereafter five more men additional, I would plow, harrow, make fence, cut seed cane, plant, cultivate, hoe, strip and do all other labor required to bring to maturity 100 acres of cane ready for harvesting. To do this work the outfit necessary would be four good strong horses, two plows, two sets of plow harness, two harrows, two one-horse cultivators, five planters hoes and five cane knives.

If the land had a good growth of Hilo grass all over it, I would clear it with the teams, using a Buckeye or some other equally effective mower.

It would not occupy any longer time than the other method, as one plowing and harrowing would soon render the soil mellow.

(To be Concluded next month.)