THE

PLANTERS' MONTHLY,

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OF THE HAWAIIAN ISLANDS.

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THE PLANTERS' MONTHLY.

The PLANTERS' MONTHLY now enters upon its second year. The past, with its successes and failures has made its record; for the future we can only assure our readers that we will continue our endeavors to make this magazine a live journal, devoted to matters of interest to planters.

We do not mean merely to discuss matters pertaining exclusively to sugar cultivation and manufacture, although such will receive the most attention, but also subjects of general interest, affecting the planting industries of this country.

We hope soon to have other valuable exchanges added to our list, and to be able to give more extensive information on our great industries than we have been able to heretofore.

We acknowledge the receipt of many interesting communications during the year, and assure those who devoted time and thought to preparing these contributions, that their efforts have been appreciated by the readers of the MONTHLY. We trust that the space allotted for communications will be well filled during the coming year.

Our thanks are also due for the kindly notices and compliments bestowed by the leading journals of this city. In regard to the vindictive attack recently made by one journal, we would remark that such personal invectives will meet with no response from us save when public interest demands it. We invite criticism and will not resent rebuke, when merited, and if made with fairness. We propose to continue to note the main events and conditions of public, affairs, whether our doing so be distasteful to the Government or not. No journal published here and devoted

to the planting, or other property interests of these Islands, can be silent when the manifest tendency of official action is menacing to those interests.

We have faith in the future of this country, although there are dark clouds which hang low, and there are weighty issues and problems which confront us, and we shall as far as in us lies work fearlessly for good government and wise administration. It behooves every good citizen thoughtfully to watch the current of events, and resent anything which tends to infringe upon those principles which underlie the great constitutional rights of life, liberty, and acquiring and protecting property, and of pursuing safety and happiness.

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PROSPECTS OF THE SUGAR INDUSTRY IN MARITIUS.

The following article published in the *Mercantile Record* of Mauritius, under date of November 28th, we take from *The Planter and Farmer* published in Brisbane, Queensland:

The whole of the present month, since we last wrote, has been very favorable to the manufacture of sugar, but unfortunately, owing to the scarcity of hands, the quantity made during that time falls short by a large figure of what it ought to be; the juice is rich, and crystalizes easily.

We still maintain our former estimate of 10,000 tons over last year, but cannot with any degree of certainty increase it; if, however, the present quantity made was not 52,000 bags short, in comparison with last crop, we we should have been disposed to value it somewhat higher.

Under all reservations we put forward the above statement, as so much depends upon the time when the remainder of the canes will be cut. As we are entering soon into the cyclone season, the richness of the juice will be affected, should we be visited by several days' rain.

We do not think the crop will be fully terminated before the end of January, as no estate has hands enough to make a large quantity of sugar per day regularly, as the day laborers are the masters of the position, obtain fancy and fabulous prices for the little work they give in return, and even then cannot be relied upon, thanks to the want of support shown by Government to the planters and to the information supplied to the head of the colony, as exemplified by the words of his speech a few days ago to the Council, showing one side of the medal; why not see the reverse, and that opinion will be modified. Thanks to the orders from the Home Government, Exeter Hall principles reign triumphant, and if such continue a short time longer, not a single Indian in the colony will re-engage, but they will gradually leave the different estates at the end of their engagements, and then farewell to many if not all the estates that have mortgages upon them.

No more need of a protector, as those men will come under the common law; no need of stipendiary magistrates and their courts; no want of an inspector of immigrants, besides the host of clerks and interpreters belonging to those departments who will have to be turned adrift. One thing is

certain, that as to the next crop no one can say whether it will be one-half of the present one (which the planters are struggling for their very life to finish) as all the repousses will necessarily be short, be guanoed late, and not properly taken care of. Such is the crisis the colony is passing through that no one can foretell how it will end, and what will be the fate of the planter, but of a certainty it is very dark.

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MANILA BASIS.

The *Commercial Herald* of San Francisco, in its annual review, under date of January 18, 1883, in treating of the contracts made by the refineries with the Hawaiian planters, illustrates the principle on which those contracts are made, as follows:

The basis on which the contracts are made with the Hawaiian planters for their sugars is on the cost from time to time of the grade of Manila Sugar classed as "superior extra," and every change in the value of that grade is telegraphed to this place from Manila. This grade of Sugar has been ascertained, from various tests, to be of 91 degrees strength by the polariscope, and of 10 degrees color, Dutch standard. The going rates of freight and British sterling exchange are taken into the calculation with the last quoted rate per picul in Manila, and the cost per 100 lbs of such sugar is ascertained as laid down in this port duty paid; and there is included all the charges, such as commissions, marine insurance, etc. The present Manila basis is $6.70 per 100 lbs, and sugars from the Sandwich Islands, just arrived, are paid for at that rate, if they test 91 degrees and 10 color. If they vary up or down, there is an addition or a deduction of an ⅛ of a cent per lb for a degree of strength, and of 1.20 of a cent per lb for a degree of color, or 12½c and 5c per 100 lbs. On the Cuba basis, on which some contracts are made, the color is not taken into the calculation —only the strength. If a lot of No. 1 Hawaiian Sugar tests 97 instead of 91, and is 15 Dutch standard instead of 10, the following result is obtained: Manila basis, $6.70 for 91 degrees, 10 color. Add for 6 extra degrees 12½c each, which is 75c, and for 5 degrees extra color, which is 25c, and we have $1 per 100 lbs to add, which makes the lot of sugar in question cost the contractor $7.70 per 100 lbs. If the sugar is No. 2, and falls off 6 degrees in strength and 5 degrees in color, the Manila basis of $6.70 is reduced to $5.70, as the cost of the lot of No. 2 sugar.

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HAWAIIAN CORPORATIONS.

The number of incorported stock companies already existing in these Islands, and the prospect that many more will soon be added to the list, renders any useful suggestions relating to the subject interesting.

In the August number of the PLANTERS' MONTHLY we gave an outline of the nature of various kinds of corporations, and of some of the advantages of incorporation. There are further suggestions of a practical nature which we would now present.

The first, is in regard to the advantages of a uniform rate in the par value of shares. The list of our incorporated companies which we give below, shows that the par value of the shares of stock vary from two thousand dollars to ten dollars each. This lack of uniformity is objectionable. It has been found in California that a uniform rate of one hundred dollars per share is the most convenient size. Ten dollar shares have been tried and found to be too small, but the one hundred dollar size has proved to be the most acceptable. With this uniform standard the whole number of shares given indicates at once the total value of the capital stock, and quotations above or below one hundred gives the market value of the stock. We advocate the adoption of this uniform standard here. It has already been demonstrated that shares of this denomination have afforded better facilities in our market for investment than the larger ones. To some who hold stock of the larger denominations which they do not wish to sell, the reasons for changing to a one hundred dollar basis may not come with much force. But even these may at any time wish to dispose of a portion of their stock, and then they may find it of great advantage to have the smaller shares.

There is no question that a greater distribution of plantation stock among all classes of our citizens will tend to strengthen the business interests of the country. The more the small capital, and savings of the people of all classes is invested in our sugar property the more will these interests be benefitted. It is not well to have the main industries of the country held by a few large owners.

The sugar property of these Islands has been distributed to a considerable extent in the past few years, and it has been of positive benefit to the whole country. Every man who has acquired such property has become a friend to its interests, and his friends here and abroad sympathize with him. We now hear but little of the talk that the sugar business is only a benefit to a few. The lines between planters and others are being rapidly effaced. To those who do not care to sell their sugar property there can be no objection to the adoption of the smaller and uniform rate, and to those who do wish to sell in order to make new investments, or otherwise, there is a decided advantage in it.

The change to the uniform basis can be easily effected. In most cases an application for an alteration of the Charter would be required, and on the granting of the application by the Minister of the Interior with the consent of the King in Privy Council, the old shares could be called in and new shares issued. In such new issue each certificate could cover all the shares held by any one holder if so desired.

The next suggestion is in relation to the choice of Directors. One or more well known business men should be elected on each Board of Directors. This is now generally done, and we would only emphasize the importance of it. The names of men known here, and abroad, as standing high in business circles appearing among the names of the Directors,

begets confidence with those who may not be personally acquainted with the men who have the immediate charge of the property.

Then as regards paying dividends we would suggest that they be paid as often as a surplus of any reasonable amount appears, not waiting to make large dividends. A dividend of five thousand dollars at the end of each month for six months, is better than one of thirty thousand dollars at the end of six months. Declaring dividends must of necessity depend on the circumstances of each case; but frequent payments at regular intervals, if even of comparatively small amounts, would enhance the market value of the stock, and be of great convenience to holders of stock.

And generally, in the management of the affairs of corporations, much care should be used to conform with the requirements of the Charters, By-Laws and the statute. Irregular or unauthorized action, or neglect of duty, may lead to serious consequences.

SUGAR STOCKS.

	No. of Shares.	Par Value.
Haiku Sugar Co	1,500	$ 500
Kohala Sugar Co	960	500
The Princeville Plantation Co	120	1,000
The Wailuku Sugar Co	480	500
Hawaiian Agricultural Co	854	500
Makee Sugar Co	5,000	100
Waimanalo Sugar Co	1,800	100
Honokaa Sugar Co	100	2,000
The Koloa Sugar Co	200	1,000
Ookala Sugar Co	100 100	500 1,000
Waihee Sugar Co	200	1,000
Pacific Mill Co	200	500
Kilauea Sugar Co	300	1,000
Hilea Sugar Co	600	500
Grove Ranch Plantation Co	800	250
Waianae Co	1,700	100
Union Mill Co	160	1,000
Olowalu Co	1,500	100
Star Mill Co	280	500
East Maui Plantation Co	288	500
Onomea Sugar Co	24,000	10
Paukaa Sugar Co	17,000	10
Reciprocity Sugar Co	600	100

RAILROAD STOCKS:

The Hawaiian Railroad Co	2,000	500
Kahului Railroad Co	150	500

TELEPHONE STOCKS:

Hawaiian Bell Telephone Co	1,000	10
Hawaiian Telephone Co (Maui)	.....	25
Kauai Telephonic Co	.....	.....
Hilo and Hawaii Telephone and Tel. Co	.....	.....

MISCELLANEOUS STOCKS:

The Honolulu Iron Works Co	200	500
C. Brewer & Company, (Mercantile)	5,000	100
Inter-Island Steam Navigation Co	3,000	100
East Maui Stock Co. (Ranch)	1,000	100

SAN FRANCISCO IMPORTS.

The following tables of imports at the port of San Francisco are taken from the *Commercial Herald and Market Review*, as published in the Annual Review.

Imports of Coffee, Tea, Rice, and sugar at this port, from January 1st to December 31st, 1881 and 1882, inclusive, as declared at the Custom House:

COFFEE.

	1881		1882	
	Lbs.	Value.	Lbs.	Value.
Central American	14,274,615	$1,780,516	18,232,742	$1,891,813
China	460,507	70,231	964,914	118,558
Hawaiian Islands	23,044	3,523	3,693	604
French Possessions	5,086	517	.....	.....
Dutch East Indies	181,198	30,250	.....	.....
British East Indies	.....	.....	.....	.....
South American	.....	.....	135,300	10,606
Spanish Possessions	21,333	2,511	.....	.....
Mexico	15,885	3,027	1,571,359	179,435
Totals	14,981,668	$1,890,575	20,908,008	$2,201,016

TEA.

China	5,278,766	$1,522,583	8,689,578	$1,206,596
Japan	12,704,741	4,257,461	19,469,028	4,444,458
British East Indies	.....	.....	12,010	3,274
Totals	17,983,507	$5,784,368	28,170,616	$5,654,328

RICE.

China	31,227,489	$717,321	11,655,324	$280,770
Hawaiian Islands	7,287,746	370,333	12,673,977	611,924
Italian	11,023	351	.....	.....
Other countries	18,396,710	372,964	30,068,043	583,796
Totals	56,922,968	$1,460,969	54,397,344	$1,476,490

SUGAR.

Central America	1,348,066	$51,551	868,818	$36,807
China	3,360,309	116,042	1,416,546	50,478
Hawaiian Islands	90,582,699	5,789,723	104,150,909	6,815,773
All other Spanish Poss'ns	12,762,120	380,490	.....	.....
Peru	.....	.....	.....	.....
Mexico	31,788	1,005	927	89
British East Indies	4,704,000	162,669	.....	.....
Germany	.....	.....	8,400	616
Totals	112,788,982	$6,501,480	106,445,600	$6,903,782

RECAPITULATION.

	1881		1882	
	Lbs.	Value.	Lbs.	Value.
Coffee	14,981,668	$1,890,575	20,908,008	$2,201,016
Tea	17,983,507	5,784,368	28,170,616	5,654,328
Rice	56,922,968	1,460,969	54,397,344	1,476,490
Sugar	112,788,982	6,501,480	106,445,600	6,903,782
Totals		$15,637,392		$16,235,616

PLANTATION RECORDS.

We have been much impressed with the importance of the keeping of full records of the expenses and income of our plantations. And upon inquiry learned of the system adopted by one of the leading business firms in Honolulu, relating to the plantations for which they are agents, which seemed to be so excellent that we took the liberty to ask the firm to supply a brief outline of their plan for publication, and have received the following statement, to which we would call thoughtful attention:

EDITOR PLANTNRS' MONTHLY: Dear Sir—In conformity with your request we hand you herewith a tabular form which we find convenient for reference. It has been our practice for some years to invite from our correspondents engaged in cane culture, estimates of the crops for the ensuing year. These cover more details than are embraced in the table which are abridged for the sake of brevity. When the year for which the estimates were made has expired the actual results placed in the same table form a convenient reference for future use. Yours truly, ***

PLANT'N EXPENSE AND INCOME FOR 1882, INCLUDING PREVIOUS ESTIMATES.

NAMES OF ESTATES.	Plant cane acres.	Ratoon acres.....	Total Plant & R't'n	Estimated yield...	Actual yield.....	Net sum received.	Ordinary exp'nses	Extra Expenses...	Interest.....	Total Expense....	Cost per ton.....	Net per ton.....

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A MARINE CABLE.

We all have thought of the benefits which would result to us from cable communication with the world, but we have not given the subject the attention its importance demands. Perhaps we have been too much impressed with the obstacles in the way of its accomplishment, and have allowed ourselves to settle into a feeling of hopelessness and almost indifference in relation to the matter. But we should be often reminded of the advantages to be gained by such communication. These advantages are almost incalculable. Those of a commercial nature are the first to suggest themselves, and are the most important for public consideration. It is such considerations that will ultimately lead to the laying of a cable in this ocean. But in addition to the more manifest commercial benefits, there are other results which would follow. Our social and political life would be most sensibly affected. Daily communication with the world would work a revolution in some of the phases of social life, and would broaden and improve it. And the political life could not fail to feel its in-

fluence. The isolation of these Islands has been an obstacle in the way of progress. As daily contact with others tends to develop and mature individual character, so daily intercourse with other governments would affect our government. The more intimate knowledge and critical observation of foreign powers thus afforded would exert a powerful influence.

Steamships, railroads and the telegraph are mighty forces in promoting civilization. Steamship communication we have and it has brought us great good. Faster ships are soon to be laid on, and we shall not have much more to expect in that line. But for daily cable communication with the world we are in great need, and the present prospects for obtaining it are not bright. Some years ago the subject of laying a marine cable across the Pacific Ocean was agitated, and presented to the public as an enterprise which might soon be undertaken. And it was with a view to affording encouragement to the proposition that a way station be established on these Islands, that an Act was passed in the Hawaiian Legislature of 1874, "For the encouragement and aid" of Incorporated Telegraph Companies. The Act was drafted, if we are correctly informed, by the late R. H. Stanley. It provides that certain facilities and privileges be granted by the Government to such companies, among which are right of way, taking of trees, devoting land for the use of stations and other purposes of the companies, remission of duties on articles and merchandise imported, exempting vessels engaged in laying or maintaining telegraph lines from port charges, and special protection for the property of the companies. This was a step in the right direction and evinced a disposition to encourage such an enterprise.

But much greater inducements should be offered, and placed prominently before those who have contemplated undertaking the laying of a Pacific Cable. A tangible offer of a large sum of money to the company who would lay such a cable, and perhaps a subsidy for a term of years for the maintenance of it, might be of great weight. The offer of a half of a million, or even a million dollars, to be paid as a bonus on the completion of the line might be very instrumental in promoting the enterprise. Such an offer would arrest attention, and perhaps lead to a careful investigation of the whole subject. It is about ten years since serious thought was given to the matter, and great changes have meanwhile taken place so that earnest, and full consideration of the subject now might demonstrate the practicability and wisdom of at once proceeding with the work. A million of dollars is a large sum of money for this country to devote to any object; but to further an undertaking of such manifest importance and benefit to the whole nation, as this, would not only be justifiable, but would meet with public endorsement. The money could be readily obtained by a loan, if undertaken wisely, for which bonds would be issued. The payments would become due at various periods, and after much of the benefits resulting from such communication had accrued, when the country would be much better able to meet them. At no period has the

importance of such communication presented itself with so great force as now. It would be impossible to enumerate all of the benefits which would result to us, but there are so many which are manifest, that the subject should be constantly kept before the public.

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THE FIJIAN SUGAR INDUSTRY.

The following account of the sugar business of Fiji, published in the *Fiji Times*, we take from the *Australian Sugar Planter*:

At the beginning of 1882, besides the old established mills on the Rewa and at Taviuni, Messrs. Stanlake, Lee & Co. and Messrs. Chalmers had only just commeneed operations. In prospect were the Colonial Sugar Refining Company's works; and the enterprises of Messrs. Wilson Brothers and Murchie at Deuba, Messrs. Sharp, Fletcher & Co. Navua, and Messrs. Billyard & Co. at Taviuni were definitely decided on. The mill of the Colonial Sugar Company has now been in active operation for some months, and the effect of the work done by them will form an important item in the exports of the year. Messrs. Stanlake, Lee & Co., after having crushed a considerable quantity of cane, disposed of their mill to the big company, and the cane, which was contributing to the first started mill, has gone to the monster factory a few miles higher up the river. The power there is so great that there has been no deficiency in the manufacture of sugar through the shutting up of the Na Deli mill, but it may be hoped that employment will be found in some other district for the valuable plant now standing idle. Active operations have been carried on throughout the year not only on the properties of Messrs. Wilson and Messrs. Shape, Fletcher & Co., in the Navua district, but also, on a very extensive scale, in another property in the same district, belonging to Messrs. Stanlake, Lee & Co., so that, before 1883 is ended, there is every reason to expect that three large sugar mills will be at work there and that the exports will be very largely increased from a district that has so far given but a very small quota to the productions sent out of the Colony. At Vana Point the work of erecting the mill has been pushed forward, and within a short time Taviuna will be sending out a large increase to her sugar shipments. Farther to Windward the Mango Island Company are putting a large acreage under cane and their machinery too may possibly be at work before 1883 is ended. Visitors prophecy very favorably of the prospects for sugar in Mango, some believing that sugar-cane will have more favorable conditions there than on the Rewa. On Vanua Levu the Dreketi river has been selected as the starting point for a large mill, and this too may probably be at work within the year. These are all new enterprises developing the resources of various points in our little group, the aggregate of which will represent a very large and valuable amount of produce. But to these is to be added the productions from the old mills, some of which have been idle almost throughout the past year. The mill at Selia Lailai has been doing good work, having been much improved, but that of Rewa Plantation Company at Ulicalia has been undergoing repairs and is now almost ready, with improved and enlarged means of manufacture, to resume work. The little Pioneer mill and Mr. Waterson's mill also manage to find some cane to crush, although terribly overweighted by their giant rivals. But in addition to

these, there is the prospect of an extension of the Nausori mill, which will largely increase the output from the Colonial Sugar Company. With such an array of new sugar-making machinery, and knowing that even then we have not mentioned all the works in contemplation for we understand that Bau, and possibly Nadi, will have their sugar mills ere long, and near Nananu, Mr. Leefe expects to have machinery out very soon. It is obvious that the sugar industry is to be a most valvable one, and that every effort should be made to aid its success and extension. A very rough estimate of the capabilities of the crushing power now at work, with that, the machinery for which is already on the way and being shipped to Fiji, give an out-turn of nearly 20,000 tons of sugar for thirty weeks' work, and that without including any night shift. That this estimate will be largely exceeded when there is a sufficient acreage under cane to keep all the mills at full work is a certainty, in fact, it might be fairly enough doubled with the same machinery. That is the immediate prospect and we are only now at the beginning of the sugar operations in Fiji. One thing only will cripple the sugar cane grower and the sugar manufacturer—lack of laboring hands—and the Governor or Government who, to support any exotic theory, throw obstacles in the way of that supply are nothing less than criminal and deserve to be ousted from their positions at once.

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ROGERS' FUEL SAVING FACILITATOR.

This appliance now in use at the Pacific Sugar Mill Works, at Kukuihaele, Hamakua, Hawaii, and which has been patented, is the invention of Mr. H. Rogers, the engineer at those works. It has been spoken of as a valuable invention and calculated to make a great saving in fuel.

We have not succeeded in obtaining a full description of the invention, and can only state that it comprehends an arrangement by which the steam after leaving the boilers is led through the combustion chamber so as to be superheated, before passing to the mains for use in the boiling house. But we requested Mr. Rogers to make a statement of the advantages of the appliance, and he has sent the following:

KUKUIHAELE, Hamakua, March 23, 1883.

EDITOR PLANTERS' MONTHLY: According to promise I will now endeavor to furnish you with information concerning the superheater which I have invented and patented, and would invite the attention of those whom it may concern, to the Pacific Sugar Mill where it is in use and doing good work. It is worth seeing, and needs to be seen to be appreciated.

And now for comparison I will state that the sugar manufactured at this mill in 1882, amounted to 800 tons, and the outside fuel used for that purpose was 213½ tons of coal, and 100 cords of firewood. I put in the superheater, and we commenced grinding January 2d, 1883, and have manufactured to date 400 tons of sugar, and the outside fuel used has been 12 cords of wood. And had it not been for irregular grinding, even that would not have been burned.

It is capable of saving all outside fuel, as it is simply a matter of capacity. In using double effects the exhaust steam is used, and if the

superheater be used it may safely be stated that their capacity would be increased at least one-third to each day's work, and no outside fuel used.

The greatest benefit is derived at the evaporator, as superheated steam is so much hotter, and drier, and has less condensation in it than boiler pressure. This will be readily understood by those having a knowledge of the use of steam.

This superheater is particularly adapted to the Mirrlees, Tait & Watson boilers, but can be adapted to any boiler or boilers, however they may be set, without causing any alterations whatever. I have given you the facts, and will be pleased to furnish any information required. Persons desiring such information can address me at the Pacific Sugar Mill, or Mr. Sass, Agent, at Honolulu. I remain yours very truly,

HENRY ROGERS.

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THE JARVIS PATENT FURNACE.

Public attention has been called to the Jarvis Patent Furnace, and we place before our readers, herewith, a statement made by Capt. E. L. Robbins, the inventor of the furnace, setting forth the benefits which he claims will result from its use. Capt. Robbins, who is now here, desires to introduce his invention to these Islands, and feels assured that it will perform all that is claimed of it.

"Competition in the sugar business has caused the proprietors of sugar plantations in Cuba and other places in the West Indies to give their attention to the solution of three questions in the cultivation of sugar cane, *i. e.* First, Economy of Fuel; Second, Saving of labor; Third, Fertilizing the land.

The first of these questions originated from the necessity, which is every day increasing, of employing a costly fuel—coal—to replace wood, which is nearly unattainable, by reason of the thoughtless destruction of the forests, and this, in the face of the fact, that dry bagazo is used to so great an extent, that it is extremely difficult for some estates to save enough of this fuel to commence the crop.

The second question is provided for in the solution of the first, if this solution is that the bagazo can be burned wet as it comes from the grinding mill.

The third question arises from the conviction that the old custom of cultivating sugar-cane by changing from *old* to *new* lands, has nearly ceased, and that the productiveness of the soil will some day come to an end; to some sooner than others. Science and experience have both proved, that substances absorbed form the earth by plants are contained in them, and the conclusion is reached that fertilizers should restore to the land those constituents taken from it by vegetation. It is in this sense that bagazo, properly prepared, is considered the best vegetable fertilizer that can be applied to lands producing sugar-cane. From the foregoing it is seen that the solution of the first and second is also in effect the solution of the rest.

Using as fuel the green bagazo, or, as it comes wet from the mill, is saving a considerable quantity of what is to-day consumed dry. Not being obliged to dry it, it is a saving of labor, as well as of the cost of turning

and gathering it. The work of grinding will not be stopped in wet weather for dry bagazo, as was the case in 1878 and 1879. Neither will the risk of fire be run, which, after commencing in the dry bagazo, destroys the costly factories of the plantations.

On the 15th of December, 1881, the Jarvis Patent Furnace was set under a flue boiler, 36 feet long by 6 feet in diameter, in the sugar house of the ingenio San Rafael, Bolondron, Cuba. This boiler was in constant operation throughout the whole season, giving more steam, with damp or fresh ground sugar-cane, than the same boiler could make with good dry bagazo, when set on the best known plan for burning such fuel. It has been heretofore impracticable, if not impossible, to burn fresh ground sugar cane trash, in a steam boiler furnace, but the "Jarvis" not only burns it, but generates more steam with such fuel than a common furnace will with dry.

Another important fact that assures the third solution, is: that boilers set with the Jarvis Furnace, do not use as much wet bagazo, by one-third, as those burning dry, thus giving the planters one-third of all their crops to be used as a fertilizer on their lands. If this is not done, it becomes only a question of time when the lands will wear out. In this case coal must be burned, so that the bagazo can be used as a fertilizer. If one-third of the crop can be used every year, in three years' time the whole plantation can be fertilized.

The Jarvis Furnace requires no more room than the common boiler furnace. It is not a costly oven or stove, but is built in the brick walls of the boiler setting, and can be placed under a steam boiler at one-third of the cost of an oven. The principle of the Jarvis system is to utilize the waste gases of combustion by the use of hot air (oxygen) on top of the fire. The air is admitted into air ducts that run back and forth in the side walls of the boiler setting; this air is heated by passing back and forth in the walls, and in this condition it joins with the gases making from the chemical combustion an intense heat. The principle is the same as the compound blow pipe or *hydro-oxygen* flame, the hottest flame known to science.

The moisture in the fuel is converted into hydrogen gas by the process of combustion. There are now over 2,700 of these boiler furnaces in operation in the United States and Canada. They are burning all kinds of waste fuel like wet peat, wet sawdust, wet logwood chips, wet tan bark, horse manure, etc. When fine dry fuel is used, like screenings, slack coal, shavings, rice chaff, etc., it is necessary to wet it thoroughly. In fact, to get the required result, it is absolutely necessary to have some moisture in the fuel to be used. In this respect bagazo is in just the proper condition. Wet bagazo burned in this furnace makes no smoke, but fills the furnace with one mass of unbroken flame.

The owner of the ingenio San Rafael has given his order to commence resetting the rest of his boilers with this system, thus showing his opinion of the results obtained. Most of the neighboring estates have ordered their boilers set this way. The advantages to be gained on sugar plantations are more numerous than with any other business; economy, increased capacity, one-third less fuel, and consequenty one-third of the crop to be saved every year for fertilizing purposes. Another advantage for sugar estates is that this system can be very well applied to sugar trains."

COMMUNICATIONS.

CARE AND FEEDING OF HORSES AND MULES.
NO. 2.

The fact is not generally known, that the stomach of a horse is but very little larger than that of an ordinary sized man; but it *is* a fact, consequently great care must be exercised in feeding. Some horses are like some men, gluttons; they appear to have hollow bones which they try to fill by eating. I had a favorite saddle horse, who, getting loose one night devoured a tub of soaked barley intended for the feed of a team; and when I went to his stable in the morning whinnied for more!

An animal, horse, mule or cow, should have all it will eat up clean, should be fed regularly, at stated times, the largest feed at night; should have not to exceed twenty pounds of hay for twenty-four hours, (this is the U. S. Army allowance). When it is through eating the feed, the box should be removed, and the feed remaining in the box reserved for next time, if dry; ifwet, given to the hogs or poultry, care being taken not togive so much the next time. A buggy or saddle horse should be fed on good clean oats, which really should be washed in a seive, the extra trouble will be repaid four fold in the appearance and health of the horse.

Working horses should have strong feed; one of the best kinds I have found to be, equal parts of crushed barley, corn meal, and crushed oats, with an occasional feed of bran and oil cake meal; this is *not* too heating unless overfed—in the hands of the ordinary driver, native or celestial, it is, but a man who owns a good animal should have him properly cared for —this feed will produce more work than any other kind, the oats will furnish the bone producing element, the barley the muscle, and the corn the fat and caloric. For mares with foal it cannot be surpassed. Horses should be watered before feeding, and, while in harness should be watered often, but this cannot be expected of the average Kanaka driver, as he never has time to irrigate any other stomach than his own. When horses are unhitched for the day they should have a small quantity of hay first—an hour afterwards a bucket of water, then their feed; before the driver goes to bed, or say about 7 o'clock, he should give them the rest of the hay—they should be watered, then fed early in the morning; no hay; before hitching up, the collars should be wiped off. Should there be any cuts or galls on the animal apply cocoanut oil freely, this will keep off flies and bring the hair back true.

In fitting new collars I have found the best plan to be, to soak the collar over night and put it on wet, and allow it to dry on the animal. Try it.

Can any one tell why horses and mules are shod with calks? does the

owner think a horse pulls with his heels? The result of calks is to spoil the horse, make him knee sprung *i. e.* cause his knees to become crooked, and brings on bone spavin; look at the sorrel horse driven in a yellow dray and a black one in a double team; when the black raises his foot from the ground he turns it half round, with a twisting motion, and the poor old sorrel reminds me of "ye hoodlum with high heels on his boots;" *don't* allow calk shoes to be put on a horse in ordinary use—there *may* be times, rarely however, when it is thought they are of use, any city front man can see it almost every day. A load of 1,000 to 1,500 ft. green NW lumber, which weighs 4 lbs. to the foot, or more, on a wagon weighing 800 to 1,000 lbs. drawn by one animal, (how much does it all weigh?) and from two to five men riding on the load, the driver, wishing to back up his load tries to do so with the little mule of about 800 lbs. weight, using his calks to the best of his ability, none of the assistants (?) heaving at the wheel, oh no, that is the mule's business, and the calks are put on his feet for that purpose alone I opine. However I have said more than enough about calked shoes, as they have always been used here and *per se* always will be; but they are bad, bad. L.

ADVANCES TO LABORERS.

EDITOR PLANTERS' MONTHLY: Probably all who have had laborers in their employ have been most decidedly convinced that the system of advances was an evil, to be endured only because it could not be avoided.

What gain is there under the Act of the last Legislature which limits the sum to be paid for contracts of one and two years? Men now agree to work a year, wages to be $13 per month; but the contract is for $10, and they receive a *present* of $36; or a present of $60 on a contract for $18 but written as twelve months at $13.

The employer has the same risk of deception, desertion and death, and the effect upon the employee of an open honest debt of which he can demand a statement at any time, is not so bad as that of a present or "bonus" which is to be returned. Would not such a contract be set aside by the Supreme Court as an evasion of the letter and intent of the law referred to? * * *

[The Act passed at the last Legislature to regulate advances paid to laborers under contracts, is of little if any practical use. The matter of advances to laborers cannot be satisfactorily regulated by law until the supply of laborers is more nearly adequate to the demand than at present. Employers are not responsible for the "advance system," it is the laborers who insist on advances, and so long as there are not a sufficient number of laborers to meet the demand their demands will have to be granted, and laws such as the one referred to will be evaded.—EDITOR.]

OTTO'S MUD PRESS.

EDITOR PLANTER'S MONTHLY: I herewith give you the results of some experiments with the Otto press for saving juice from skimmings on the Alexander & Baldwin plantation. At this mill formerly we did not skim the clarifiers but allowed the juice to come to a boil, then drew out from a cock placed about an inch from the bottom of the clarifiers, all the juice that would run clear, then a two inch pipe on the *bottom* was opened and all that would run was let out into a settling tank, then the dirt which would not run was led away into the sea. After we got the Otto press I had this dirt, just as the man would have washed it away, put into a sugar bag and weighed and found the weight 194 lbs. I allowed it to drain until the refuse was about as dry as that which comes from the press and found it weighed 83 lbs., therefore 111 lbs of juice must have drained away. Thus I found we had been skimming and throwing away from the cleaners about 26 lbs. or 24 lbs. of juice making a total loss per clarifier of 125 lbs. of juice. Reckoning 9 lbs. per gal. we have about 14 gals. at say 1½ lbs. of sugar per gal., 21 lbs. of sugar at 6c or $1.26 per clarifier; 30 clarifiers per day $37.80. Besides this we save all the settlings from the juice tanks which is quite an item and which before was thrown away.

Per contra we have:

One mud press complete with engine to run same, $1,200; interrest on same at 10 per cent., $120, for 200 days grinding season, per day	$ 60
Three extra men	3 00
Wear and tear per day	40
Sixty bags on frames at 10c, $6, to be renewed every two weeks. Per day	50
Sewing them on, 5 days work (women), $2.50 per day	20
Over time per day	25
Extra fuel for engine	1 00
Total	$5 95

It will be seen that five clarifiers per day will more than pay the expenses of the press and the larger the capacity of the mill the more is saved. The amount saved will vary according to the amount of skimmings per clarifier as sometimes we find a given amount of cane will yield say eight presses whereas the same amount of another field would yield but five, as a matter of course the greater the amount of skimmings the greater the loss. We find also that here the capacity of the large frames are about 10 clarifiers, so that a mill of 25 or 30 clarifier capacity should have three large frames or presses to produce the best results.

It is claimed by men here who have experimented both in skimming and not skimming the clarifier, that the latter method is the most saving, however, I would like to see exact figures of the result of such experiments. Yours truly

PAIA, Maui, March 10th, 1883. E. M. WALSH.

CULTIVATION OF RATOONS.

EDITOR PLANTERS' MONTHLY: During an hour on the Island of Hawaii, last September my attention was called to a vast amount of poor first ratoons, which upon inquiry I found were from cane which had been cut as late as the months of March and April. This of course would only give them seven to eight months to mature if they should tassel during the following November, and we must all admit not much of a crop can be expected in that time.

My object in now writing is to give my experience of the cultivation of first ratoons under similar circumstances, which proves I think the possibility of obtaining a large yield with little extra trouble.

During the season of 1879–80 we were somewhat delayed with our grinding owing to wet weather and an accident to the mill, and did not cut much plant cane until March and April, 1880. Now had I cultivated from that time our ratoon crop would not have amounted to more than about 1,500 or 2,000 lbs. of sugar to the acre, as it would have had but seven months growth up to November—when most of the cane in this district arrives at full maturity and tassels. The plan I adopted was as follows: After finishing grinding a field of twenty acres in April, 1880, the trash was burnt and young shoots allowed to start. The field was irrigated but once up to June 12th, and the ratoons had then grown from ten to twelve inches in height, when I put men in with hoes and cut all down level with the ground. I then ran a horse plow on both sides of the furrows, hilling up the roots, and commenced irrigating. The result was a new growth of cane, very thick and vigorous, and after 17 months growth we realized from the field 210 clarifiers, which gave us 830 lbs of sugar to the clarifier, making the yield about 4½ tons to the acre, which is as good a yield as from plant cane.

I am positive that had the ratoons I saw in the Hamakua and Hilo districts of Hawaii been treated in the same way they would realize fully as much. We have now to come off this season about forty acres of the same kind of ratoons, and I feel sure it will all yield four tons per acre.

I am, sir, yours &c. WM. H. CORNWELL.

Waikapu, Maui, March 9th, 1883.

We hope ere long to exchange with *The Barbadoes Planters' Gazette* published in the Island of Barbadoes; and with the *Merchants' and Planters' Gazette* and the *Mercantile Record*, published in Mauritius. We have forwarded copies of the PLANTERS' MONTHLY to them. The Planters' Company has also subscribed for them to add to the files in the company's office.

ITEMS.

—The Sugar Planters' Association of Louisiana holds regular monthly meetings.

—We acknowledge with thanks the complimentary notices of the PLANTERS' MONTHLY by the *Australian Sugar Planter.*

—The steamship *Abergelde* sailed from St. Michaels on the second day of March for Honolulu, with about 850 Portuguese emigrant laborers. It is hoped that another steamer will follow her.

—The communication from Mr. W. H. Cornwell of Waikapu, Maui, on the cultivation of ratoons is deserving of careful attention. Such articles are most interesting to planters.

—The Pacific Mail Steamship Co.'s steamship *City of Tokio* is expected here early in next from Hongkong, on her way to San Francisco. It is reported that she will bring 1,000 to 1,500 Chinese laborers.

—The new Royal Hawaiian Agricultural Society proposes to have a Fair in June, at Honolulu. The list of the articles proposed to be exhibited has been published. If well planned and conducted the exhibition will be of value to the country.

—Accounts of the sugar industry in Maritius and Fiji, which we publish in this number, speak of the scarcity of labor for the plantations. Those countries have the sympathy of Hawaiian planters, for we contend here with a similar difficulty.

—Calms and southerly winds extended nearly through the whole of last month. Though not our most agreeable weather it has on the whole been favorable to the harvesting of crops. The long continuance of this weather is exceptional for the month of March.

—We omitted to prepare an index to volume one of the PLANTERS' MONTHLY to be published with the last number. We herewith present it in loose sheets, in convenient form for binding with the volume if desired. Or it may be pasted into the last number of the volume.

—The subject of the best kind of agreements to be made between mill owners, and those who grow the crops has received much attention in Louisiana. The plan of dividing the sugar in proportions agreed on, as well as other plans, has been tried. Many now advocate buying the cane by the ton in the field. It is urged however, with much force, that this plan entails much greater risk on the mill owner than on the planter. Large cane of poor quality often weighs as much as good cane of a like size. And losses are much more likely to occur at the mill or boiling house than in the field.

—The *Times* (London) of February 9th, devotes a leader to the account of a deputation which waited on Lords Derby and Granville, with the object of endeavoring "to secure the inhabitants of the New Hebrides from certain evils to which they are alleged to be subjected." In the course of a long conversation, "Lord Derby significantly remarked to the deputation that a commission had recently been appointed, consisting of Sir Arthur Gordon and of two distinguished naval officers in command of Her Majesty's ships in that part of the world, to consider what means can be adopted for bringing to justice British subjects, and others, who may commit crimes in the Pacific Islands." Of course this commission would have no occasion to interfere with a properly conducted expedition under the Hawaiian flag and duly authorized by the Hawaiian Board of Immigration.

—The working of the Hawaiian Treaty is to be investigated. According to a telegram dated Washington, March 8th, Secretary Folger has directed N. W. Bingham and S. E. Chamberlin, special agents of the Treasury Department, to proceed to San Francisco and Portland for the purpose of making a thorough investigation of the whole subject of the importation at those ports of sugars free of duty under the Hawaiian treaty. It will be remembered that Representative Perry Belmont made a minority report to Congress on this subject; in which he referred to the extensive frauds alleged to have been perpetrated on the Revenue Department at the ports in question under the treaty with Hawaii.

—Following is the new United States Sugar Tariff on sugars under and to No. 13 Dutch standard, duty for 75° per polariscope, $1.40 per cwt.; and for each additional degree, 4 cents per cwt:

Old Duty to No. 7	$2.18¾
Old Duty, 7 to 10	2.50
Old Duty, 20 to 13	2.81¾
Old Duty, 13 to 16	3.43¾
Old Duty, 16 to 20	4.06¼
New Duty to No. 7, if averaging 85°	$1.80
New Duty to No. 7 to 10, if averaging 90°	2.00
New Duty to No. 10 to 13, if averaging 93°	2.12
New Duty to No. 13 to 16, specific	2.50
New Duty to No. 16 to 20, specific	3.00

SUGAR CROP ESTIMATES.—The following is from the New York Shipping List:

CUBA.—A rainy week, combined with a disposition on the part of the planters to keep sugars on the estates until wanted, has caused moderate receipts at ports of shipment, and light shipments this way. The United States have not suffered for free supplies of sugar in January, and a continuance of delay in the Cuba crop merely limits the consumption of the entire crop to fewer months of the year. The crop estimates are now 550,000 to 600,000 tons.

BRAZIL.—Latest cables indicate that crops are short to the extent of 70,000 tons Pernambuco districts, and 50,000 tons Bahia and Aracajo. It is quite possible, however, that receipts may yet increase in March.

ANTIGUA, Jan. 19.—Prospects of a good average crop, say 12,000 hogsheads, against 13,000 hogsheads in 1882.

FORMOSA, Sept. 21.—First shipments of new crop will be made about three weeks earlier than last season.

TRINIDAD, Jan. 15.—Crops will be general in a fortnight. A good average crop is expected, say 50,000 tons against 54,000 tons last year, of which the United States received 8538 tons, and should receive a much larger quantity in 1883.

BARBADOES, Jan, 16.—Sugar making is likely to commence last of next month. Crop of 1882 was 46,000 tons, of which the United States received 14,000 tons. The crop of 1883 will be an average one.

MANILA, Jan. 27.—Shipments of sugar to the United States since January 1st are 2500 tons, against none January, 1882.

LONDON.—The Market for the week has continued very depressed and quotations have declined to 22s 6d for 96 degrees centrifugals, 19s 6d for fair refining. 19s for beet. Stock in four ports have increased 2100 tons, and are 66,000 over last year.—*Sugar Bowl.*

PURE BRED, THOROUGHBRED, AND FULL BLOOD IN STOCK RAISING.

The three principal designations of stock are: 1, Pure bred; 2, Thoroughbred; and 3, Full blood.

1. A pure bred animal is one descended from a pure or original race without intermixture of other blood. The Devons are a pure race of cattle. The wild cattle of Chillingham may be called a pure race. The buffalo is a pure race. The true Arabian horse is a pure race. Wild animals are pure races.

2. A thoroughbred is an animal originally of mixed lineage, but which has been interbred so long without recourse to foreign sources that the progeny comes true, or nearly true, to the type established. The Shorthorns and Herefords among cattle and the racers among horses arising from a mixed lineage are thoroughbreds. That they have not yet ceased the endeavor to improve these breeds, through the careful selection of sires and dams, always carefully within the line of the oldest and well defined blood of the varieties from which they originally sprang, is proof that breeders do not believe that their ultimate excellence has been reached.

3. The term full blood indicates neither purity of blood nor thorough breeding, except relatively. An animal of the common blood of a country may be bred indefinitely to a pure blood, and yet never reach purity. The first cross would be one-half blood; the second cross, three quarters blood; the third cross, seven-eighths blood; the fourth cross, fifteen-sixteenths; the fifth, thirty-three thirty-fourths of the pure or the thoroughbred blood, if none other has been used in the cross. Yet the resulting progeny would always contain a fraction of the original or pure blood. Yet often seven-eighths, and especially those fifteen-sixteenths bred, show the characteristics to so great a degree that none but experts can distinguish from outward observation between the full blood and the pure or thoroughbred type. Hence seven-eights or fifteen-sixteenths bred animals are by courtesy sometimes called full bloods.

A grade is an animal containing some pure or thorough bred blood. A seven-eights grade is sometimes called a high grade.—*Prairie Farmer.*

SUGAR PLANTATIONS ON THE ISLAND OF CUBA.

HAVANA, Cuba, Dec. 24, 1882.

I left New Orleans on Thanksgiving day, November 30th, and reached here December 3rd, coming by way of the river to its mouth and then on to Cedar Keys and Key West; at each of which places I had several hours on shore. Here in Havana I find everything unlike anything I had ever seen before. The city lies on a flat plain shut in by low hills. Across the bay is a splendid breezy height, but it is monopolized by the fortress and no residences are allowed upon it. It is a pity as it would make a magnificent location for suburban residences; being high and well drained,and swept by ocean breezes. As it is the rich must herd with the poor in the city; the wealthy mansion side by side with the negro hut, and as the drainage is bad and no attention paid to cleaning the streets, the two take the fever together. I don't wonder that the yellow fever is almost perennial here. I should think any kind of filthy disease would flourish for it has nastiness and heat combined to feed upon.

I went last night into the country, spending two days on a plantation, or *Ingenio*, as they are called here, and two more days at Cardenas. I had gathered my ideas of plantation life in the tropics mainly from my Hawaiian experience and looked to find another Ulupalakua, but on a grander scale. But I was mightily mistaken. The plantation was very large, some 60,000 acres in extent, with over 7,000 in cane and as much more in wood land, and a sugar house, including machinery, that could not be built for $400,000. But had the proprietor been an ignorant cobbler he could hardly have lived with less luxury, not to say comfort, at least according to our ideas of comfort. The house was a single story with roof and floor of tiles, The windows, like Hawaiian houses, were "French," opening upon the piazza, like doors. They were of blind slats with inner shutters of heavy plank, but *no glass*. A marble top table with a few papers and books, a dining table and some chairs of rough hand made frames seated and backed with hide dried with the hair on, furnished the livroom, around which were hung framed lithographs and advertising pictures of machinery.

The food was cooked well according to Spanish taste, I suppose, and I had no fault to find with the most of it, except that I should have preferred something else than fresh pork and other vegetables than potatoes and onions. There was a boiled root called Yucca that I thought might be something like Pia, as I am told they make starch of it. In growing the bush looks like a high bush blueberry. The sweet potatoes are very good and mealy; Irish potatoes are not so dry. Outside the house was a little garden with a few plants in soap-boxes and wine boxes, but the season has been terribly dry and everything looked sickly and dusty.

Last September there were two tremendous hurricanes, that destroyed the bananas so that they are still quite scarce here in the city, and on the plantations there are as yet none ripe. As for oranges I did not see a tree, or indeed of any fruit, although this is the fruit garden of the world. Outside the garden fence the ground about the sugar room was trodden bare and brown by the hoofs of horses and oxen.

The buildings were arranged as

nearly as possible to the center of the cane tract and as the ground was a dead level with occasional hillocks, there is no view at all. Access to the railroad station was by a railroad switch track for sugar, etc., and by horseback for humans.

In all the country traveling is almost entirely by horseback, though in my trips of 200 miles and more, I did see two *volantes*—chaises with long shafts and wheels behind almost as solid as ox cart wheels. These use two horses, one in the shafts, which are fully ten feet long, the other beside him attached to a whiffle-tree by long ropes. The side horse is ridden *a la* postilion by the driver and as the carriage seat is nearly midway between the wheels and the horse, it makes a sort of sedan chair, or buckboard spring that enables the rider to jounce over the rocks without dislocating his spine.

While at Cardenas I rode out about ten miles into the country to look at some machinery of our manufacture at work. Cardenas is one of the oldest cities on the island, with a population of 25,000 to 30,000 and I doubt not the road has been in existence for 100 years, but you would hardly find worse places on the road to the volcano than we found that day. We passed one ox wagon, the only vehicle I saw. The frame mounted on two wheels was like one of our own N. E. carts. The pole oxen were large strong animals with the yoke fastened to the horns. The yoke is quite light and is lashed to the horns (just back of which it lies) only enough to prevent slipping. A broad soft cushion lies against the forehead across which there are ropes lashing it to the yoke. In this way the entire strain of the pull comes upon the hard bones of the upper forehead, enabling the ox to throw his whole weight against it.

Besides the pole oxen there was another yoke of smaller ones on the lead at the end of a rope so long that they were ten feet ahead of the pole, and thirty feet farther ahead was another yoke of little steers hardly bigger than half-grown heifers.

Before I came here I wondered why the Cubans had'nt given up their oxen and taken to mules like the Louisiana planters, but after seeing these rocks I am not so much surprised. On the plantation where I first visited I found cane growing on land as rough and full of rocks as a down east sheep pasture. How they managed to plough such land is a mystery to me, but they *did*, and now *with a ratoon crop* 11 *years running they will take off, in spite of the drought, over a ton of sugar to the acre*, and had there been sufficient rain would have doubled the amount.—*** *In Hawaiian Gazette.*

SUGAR MAKING IN GERMANY.—It is stated that during the last season fifteen new factories have been started, and next year probably eighteen more will go into operation. Besides these eighteen, which will be ready for work before the sugar making season begins, about thirty new ones are in contemplation.

It is reckoned that the quantity of beets that will probably be worked up in Germany in the season of 1883-'84 is estimated at about seven and a half million tons; that is the German production has doubled in four years. The increase in the production is greater than the establishment of these new factories would indicate, for the old ones have added considerably to their powers of production; and the yield, owing to the improvements in cultivation and manipulation, tends to increase every year.—*The Sugar Planter*, (*Louisiana.*)

THE RABBIT PLAGUE IN AUSTRALIA.—A BIG CHANCE FOR A PAYING INVENTION.—The ancient saying that the race is not always to the swift nor the battle to the strong is receiving a new illustration in Australia. Of all animals the timid rabbit would seem to be the last that would ever wage a war of extermination against man; and yet that is precisely what it is doing in Australia. One colony has already lost two million of sheep by them; the plague is spreading northward at the rate of 100 miles or more a year; and the *Federal Australian* says that the rabbit invasion threatens the great industry of the colony with ruin. "The impossibility of feeding large flocks of sheep and innumerable rabbits at the same time on the same breadth of pasturage, is just as great as would be that of growing wheat and hay on the same soil. There is only one alternative in this case: either the flock owners must expel the rabbits, or the rabbits will expel the flock owners." The conviction is that the evil has attained a magnitude which puts it beyond the hope of control by local efforts, or even by any one colony. The movement for the extermination of the rabbits must be simultaneous and universal to be of any avail.

The proposition now is for a general act of the colonial assemblies levying a tax on all lands, whether stocked or not, to meet the cost of a general war upon the invaders by the colonial governments. It is proposed that each colony shall appoint a staff of rabbit inspectors to enforce repressive legislation, each colony undertaking to keep its own borders free from the plague.

"The flock owners over the entire area of the continent," says the *Australian*, "must make common cause in the endeavor to exterminate the plague, and to that end must aid their respective governments by every means in their power. War to the knife must be declared by every individual interested in station property in Australia against a pestilence which positively threatens nothing less than the gradual destruction of the wealthiest interest that has yet grown into flourishing existence in this part of the world."

Having declared general war upon the rabbits, the great question would appear to be the devising of modes of attack that will be at once efficient and economical. One flock-owner is mentioned as having trapped 5,000 of the little pests in a space of four months; others have tried general poisoning, and yet no perceptible check has been put upon the rapid multiplication of the prolific and all-devouring vermin. Shooting the rabbits is out of the question, there are so many of them, their wariness and burrowing habits adding to the hopelessness of meeting the invasion by individual destruction. They must be killed by the million, and at a cost that will not exceed the value of the land reclaimed from their ravages.

Probably the most welcome guest in Australia to-day would be the inventor of a solution for this pressing and all important problem. The money values at stake are enormous; and the successful inventor of a cure for the evil, which so gravely threatens the prosperity and future progress of the Australian colonies, would doubtless make as good a thing for himself as his invention would be for the sheep raisers.—*Scientific American.*

AMERICAN CATTLE.—The *New England Farmer*, in an article on the cultivation of a home breed of cattle that shall take the place of the foreign breeds that are valuable for a special purpose, says:

"What we want is a cow of good size, so that her steer calves will, when grown, make oxen that can draw a full load. Her form should be such that when her days of usefulness are numbered, she will bring

a good price at the butcher's, and she should be so good a milker that she can feed her own calf, and afterwards supply the family with milk, butter or cheese for a number of months. It is not necessary that she should be so much given to milk that she cannot be dried off with safety before calving. The general purpose cow, weighing from nine to twelve hundred pounds alive should produce steers that will easily weigh thirty hundred pounds per pair at four to five years old, and she should be able to give from twelve to sixteen quarts of milk per day for five or six months, that will made a pound of butter per day, or two hundred pounds per year. Such cows can be found among nearly all our foreign and native breeds of cattle, and they are always in demand, just as a good, lively, intelligent, round built, ten hundred family horse is always in demand. Such animals will find more buyers than any other class, simply because they are adapted to the wants of a greater number of persons than is any other class.

"The time must come, sooner or later, when an animal will be valued according to its ability to *do*, and not for its family connections alone, and when that time does come, the great milker of one breed will be on about the same level with the great milker of another breed, and the beef animal will be valued not so much on account of his place in the herd book as from the fact that he can lay on more pounds of good meat on his bones for the amount of food consumed, than can some animals. It is true that we have no American breed of cattle now. There are a few farmers scattered here and there, over the country, who have for a longer or shorter period been breeding American cows with skill and good judgment. There are a few such herds in the vicinity of Worcester, Mass. They have descended from some extra good mother cows, and their offspring are doing credit both to their parentage and to their breeders.

If every American farmer, who finds himself possessed of a superior cow, would strive to perpetuate her stock, and let her calves take the place of the inferior animals which are too often kept for breeders, the time would come after a while, that we could have an American breed of cows of such high excellence that there would be little need of going to Europe and paying fancy prices for imported stock."

PRESERVING EGGS.——About a year ago I put down a quantity of fresh eggs in various ways for the purpose of testing the merits of each particular method. The lime and salt mixture, consisting of one pint of lime, newly slacked, and one pound of salt, well stirred in a ten-quart pail of water, kept the eggs very well for six months, when the whites become clouded and the yolks dark and too tough to beat up. The mixture of beeswax, melted with twice as much olive-oil, smeared, while warm, over eggs, kept the eggs well for a year, and some of the eggs, yet unused, are still good. Those eggs which were thus prepared and packed in air slacked lime kept better than others packed in oats; the latter tasted considerably of the rancid oil, which seemed to be absorbed.

The eggs covered with melted paraffine kept the best of all, and those of them that were put down in weak brine, in which they sank to the bottom, kept better than other packed in dry salt or in plaster. Since then I have become acquainted with a German preparation of salt, salpetre and borax, which, however, is patented in America. I have some eggs put down in this for five months, and they are equal to fresh eggs, even when boiled for eating, a very delicate test, as eggs very soon exhibit any staleness when so cooked. An omelette made of eggs put down in

this solution was very good, and so was one made of eggs a year old kept in paraffine, as was also a sponge-cake made of beaten eggs. Paraffine is easily removed from the shells by holding them in hot water for a short time. The salt and lime mixture and the German salt both keep the shells in perfect condition, and simple rinsing only is required to cleanse them. I think the German salt promises to be the best, but it is outrageously dear.—*American Dairyman.*

BREEDING IN-AND-IN.—The following applies to animals as well as poultry:

Breeding in-and-in, is the most baneful process that can be practiced. Nothing operates so quickly to lessen the vigor of a breed as this, and, if continued, is ruinous. Sometimes the practice is necessary, if we wish to continue certain peculiarities of shape and qualities, but good judgment will suffice for the purpose of accomplishing the desired object. If we wish to perpetuate certain points, it is best to use only males, and when the close breeding has been continued for a sufficient time, a new blood of cocks may be started by introducing a hen from another yard, and breeding from her alone for cocks. The pullet should be bred from a new hen procured from another source. The selection of the two breeding hens should be done with care, and they should not be inferior to the stock desired to be crossed. We believe in keeping up a strain of cocks, if they possess peculiar merit, and in order to do so in-breeding is necessary. If a cock is closely bred, or in-bred, it does not interfere with his value for crossing on common fowls, as the cross alone gives.

Breed true if you desire to attain eertain objects. Let not the least taint be introdnced among your flock. Cull out the weak, and select the strong, and as long as they display vigor and strength, you have nothing to fear. The first sign of decay is in the eggs. They will not hatch well. After awhile none will hatch. As long as your young chicks come forth strong, and keep in health, the in-breeding is doing no damage.—*Poultry Nation.*

The term Dextrose is now preferred by scientific men to glucose, but we will use the old name—Grape Sugar. It is a form of sugar that exists in various fruits, being often found on old raisins, and is made artificially. It may be made from sawdust, cotton, or other form of vegetable fibre, but starch is the material generally used in its manufacture. When starch is boiled for several hours in weak sulphuric acid (oil of vitriol) it is converted into grape sugar while the acid remains unchanged, and is removed by adding some form of carbonate of lime to neutralize it. The grape sugar is obtained on evaporating the liquid. It is sometimes in crystals, but usually as a thick syrup.

Any form of starch may be used; in this country it is the starch of Indian corn, while in Europe it is usually potato starch. It differs from cane sugar (produced also by the beet, some of the sorghums and sugar maple,) in having less than half the sweetening power. It is said to to be used in Europe to adulterate the common sugars, but in this country, where such sugars are little used, it is more likely to be mixed with syrup. It is easily detected by the chemist, but for others its lack of sweetness is the test.—*American Agriculturist.*