THE HAWAIIAN

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The latest quotation of sugar in New York, for 96 deg. test, was $4\frac{1}{8}$c., with the usual supplies of raw sugar on hand.

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The weather throughout this group has been unusually stormy during the past two months, which has tended to interrupt the work on some plantations, while on others freshets have caused considerable damage by washing out young plant canes and rattoons with the soil.

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The Island of Mauritius, which is one of the most progressive and intelligent cane countries, has given up the process of diffusion after very exhaustive experiments and practical trials given to it. The cost of combustion has turned out too high, so that the advantages obtained by the process found themselves more than counterbalanced by the disadvantages.

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The Watsonville beet sugar campaign for 1897 showed a total of 110,786 short tons of sliced beets worked up, with an output of 14,888 short tons of beet sugar. The yield is stated to have been very small, owing to unfavorable weather, the total average being less than one and a half tons of sugar to the acre. The Chino, Pecos and Lehi factories give similar reports of small crops.

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Leisure has a value of its own. It is not a mere handmaid to labor; it is something we should know how to cultivate, to use and to enjoy. It has a distinct and honorable place wherever nations are released from the pressure of their first rude needs, their homely toil, and vice, to happier levels of grace and intellectual repose.—Ex.

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The best friends of America desire that amid all her prosperity she should not fall away into improvidence and luxury, but ever retain and cultivate that habit of simple and secure living which was shown by her Puritan fathers. With all their faults and narrow ideas, these noble pilgrims were models of true and honest simplicity and frugality of life.

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The New South Wales Government propose to submit to Parliament two Bills dealing with the restriction of alien immigration. The first will propose the imposition of an educational test as is now in force in Natal, and the second will enlarge the provisions of the Chinese Restriction Act so as to make the statute apply to all colored races except natives of British dominions.

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The Government Chemists report that the Dutch sugar seized in Ohio by Food Commissioner Blackburn showed a polarization 99.6; coloring matter heavily blued with ultramarine. The polarization, says Secretary Wilson in a letter to the Secretary of the Treasury, shows that the sugar was of an inferior quality of granulated sugar, and the amount of bluing employed was largely in excess of that ordinarily used.

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The Sugar Cane says that some idea may be formed of the extent of damage done to the sugar cane by grubs in Australia, from the information supplied by the Queenslander that the money voluntarily raised and supplemented by the Government was sufficient to pay for the destruction of about 60 tons of beetles, and it is only by such energetic measures that the pest can be kept in hand.

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Two cars of late Valencia oranges from California were auctioned in New York in February. The first car made an average of $4.40—one of the finest sales of the season; the other car sold at much lower prices. The lemon market is lower, and very little sells above $2.50 per box, and then all the way down to 90 cents, which is very unsatisfactory, remembering that freight, present duty and petties require at least $1.25 to equal actual charges.

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A. T. Stewart (the New York millionaire) studied for the ministry, and became a teacher, before he drifted into his proper calling as a merchant, through the accident of having lent money to a friend. The latter, with failure imminent, insisted that his creditor should take the shop as the only means of securing the money, which he did, and secured not only the debt, but a fortune.

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The Russian Government has placed an additional order for 14 locomotives with the Baldwin Locomotive Works, of Philadelphia, Penn. These are to be used on the regular railway lines in European Russia, and the locomotives formerly used there will be placed on the Trans-Siberian lines. This new order makes in all 34 locomotives now in process of construction for the Russian Government at the Baldwin Works.

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For the second time in the history of the commerce of the United States, the exports passed the billion dollar mark in 1897, the total exports of merchandise reaching $1,099,129,000; an increase over 1896 of $93,292,000. The imports of merchandise for the year were $742,630,000, total imports and exports of merchandise $1,841,759,000, against $1,689,416,000. The excess of exports over imports of merchandise was $156,498,000. In 1891 and 1892 the total commerce nearly reached the total for 1897, which is now the banner year.

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Germany has been interested to know about the employment of women in American postal service. In answer to an inquiry the Germans have been informed that there are between 7000 and 8000 women postmasters in this country, that almost 80,000 women are employed in some way or other in the postal service, that they are as intelligent, honest and trustworthy as men and receive from $240, to $1800 a year. There are no women railway postal clerks, letter carriers or post office inspectors, for obvious reasons.

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Java newspapers draw a dark picture of the planters' lot and their prospects in the near future. The sugar planters find that the incidence of taxation and the low price ruling for the staple fall upon them with crushing weight; to add to this, in some districts the canes perish from disease attacking their roots. Estimating the number of sugar estates in that island at 200, the above journal goes into figures. The result is the forecast that as matters now stand 18 estates will make a small profit, 28 will just pay expenses, while the remaining 154 will suffer loss.

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An American trade circular in an article on the Cuban sugar crop states that this year the harvest will yield about 300,000 tons. The crop has been largely raised this year under independent protection against both the insurgent and Spanish armies. It is further stated that both sections are getting tired of the war, but neither side shows a disposition to compromise. Strictly Cuban rule would be repulsive to most of the property-holders and planters, who would welcome either a workable scheme of autonomy conferred by Spain or a union with the United States, rather than complete independence.

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Willett & Gray say: "Neither of the two new sugar factories building in New York—the Arbuckle and the Doscher, will be completed as soon as was expected. The latest authentic information we have received indicates that the Doscher factory will be ready in October, with the bare possibility of working by the last of September, and that the Arbuckle refinery cannot be completed before October, with the possibility of not making sugar for a month or two later. Each house will have a capacity of about 3,500 barrels of sugar per day. Neither of these companies is in the market yet for supplies of raw sugar."

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A large beet sugar factory is to be erected near Binghampton, New York State, where all the conditions are considered favorable for making beet sugar. The farmers for a hundred miles around are signing contracts to furnish beets for the refinery. The work of laying out the building has commenced, and nearly all the machinery, which was purchased in Europe, has arrived. It is expected that the refinery will be in operation in season to consume the crop of beets now being planted. It is said that the prospect of success is very good. This will be the second beet factory erected in the State.

The average sugar contents of beets grown in twenty-four counties of New York is 16.89 per cent.; purity of the juice, 83.5 per cent.; number of samples analyzed, 425; yield per acre, 16.95 tons. The Empire State could raise enough sugar to supply the United States, if it would place 1,000,000 acres of beets under cultivation. Willett & Gray say: "The First New York Beet Sugar Company, of Rome, N. Y., report their operations this, their first season, as follows: We received 4,596 tons of sugar beets at our factory. The average per. cent. of the white beets delivered was 13½ per cent. The amount of granulated sugar made was 334,500 pounds. Amount of seconds 350,000 pounds.

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The new Oahu Sugar Plantation has now 1200 acres of cane planted and growing, which will make its first crop. It is seldom that a plantation here, or perhaps in any country, has been able to secure so large an acreage for its first year's work. But the art of cane cultivation and sugar making has reached such perfection, that every part of the field work and the mill work—and every piece of the machinery which is new and straight from the factory—can be relied on to do its work, whenever the signal to start operations is given. This, of course, will not be for some time to come, but so far everything has moved along without any serious hitch, and fully up to expectations.

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Another novelty in sugar production out of cane has been tried, and, as it seems, failed in Mauritius, viz.: the cane culture from seed. There are still some few planters who continue the experiments in that direction, but the general enthusiastic views have disappeared. The production of cane in that way is too slow and difficult to attract many partisans. It is about the same with the sexual propagation of the beet, which a few years ago made its appearance, exciting great hopes with regard to the maintenance of the qualities obtained formerly by sagacious selection, but now-a-days it is little spoken of.—Exc.

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Grinding operations in Demerara are now in progress on the sugar estates of the Colony, and though the crop is heavy there are strong complaints that the juice is of a very poor quality. The promise, therefore, which was held out at the beginning of the season as to a bountiful yield will hardly be realized. Certainly the yield of last year's crop will not be equaled. The inferiority of the juice is mainly due to a lack of good ripening weather, and to the drought which obtained early in the season when the canes were growing. Reports as to the sugar crops in the West Indies are more favorable. In Trinidad a good yield is anticipated; the canes are large and healthy, and the juice is of good quality. In Barbadoes the planters have had a most successful harvest, the sugar crop being in every way satisfactory.—Demerara Chronicle.

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Post Office Vagaries in India.—Sir:—Along with my tappal on Sunday evening last I received a copy of Planting Opinion, which on examination proved to be addressed to "The Editor, Planters' Monthly, Honolulu." I only mention this brilliant, but by no means unparalleled, effort on the part of the Post Office authorities, as I noticed, and quite agree with the remark of your Kadur correspondent, who says that it is so easy to find fault, and that he thinks when good work is done it ought to be taken notice of. Let it be clearly understood, however, that I do not refer to this matter in a fault-finding way. I merely mention it as I not only consider it good but brilliant work. Hanbalu is my Post Office, and he must be dense indeed who cannot see a resemblance between Hanbalu and Honolulu. They are working up to Honolulu gradually, and little flashes of genius of this kind serve to make life in the "Gorgeous East" all the pleasanter and happier. I think they ought to be encouraged, and I would suggest that the "Sorter" who was responsible for the one mentioned be made permanent with an increase of pay.

J. Aird, in Planting Opinion.

Archullu, Hanbalu, Dec., 1897.

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Bees and Crops.—A correspondent to the Madras Mail raises an interesting question as to how far the short crops of nowadays are induced by a paucity of those famous fertilizers, bees. Is it not, however, a slip of the pen that makes the writer state that a bee only visits 150 flowers in a day? Surely this must be a mistake. We have watched bees at work, and they certainly, according to the above rate, got through their day's work in well under the hour! But this is only a detail and does not affect the question at issue, which is this: is coffee fertilization effected chiefly by bees, and if so, have their numbers generally diminished? If this turns out to be the case in both instances, the necessity for their protection and encouragement is obvious. The first, protection, is a most difficult matter to arrange, but a great deal could be done in the way of encouragement by the erection of suitable shelters and cheap hives in suitable corners of the estate. The average feeding range of the ordinary bee is only, we believe, two or three miles, so that in compact districts a striking improvement in the supply could be effected at very little cost.

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Since 1894 the production of oleomargarine has declined over 33 per cent., due to hostile legislation and possibly to the low price of butter ruling this year. The year of maximum production was 1894, when taxes amounting to $1,723,479 were paid on an output of 69,622,246 pounds. In 1888 the output was 34,325,527 pounds, and did not increase to any extent until 1891, when it rose to 44,392,409 pounds, since which time the production and the yearly average cost of Western creamery butter has been as follows:

| | Pounds. | Cents. |
|---|---|---|
| 1892 | 48,364,155 | $21\frac{5}{8}$ |
| 1893 | 67,224,298 | $24\frac{1}{2}$ |
| 1894 | 69,622,246 | $21\frac{3}{4}$ |
| 1895 | 56,958,105 | 19 |
| 1896 | 50,853,234 | 17 |
| 1897 | 45,534,559 | $15\frac{1}{2}$ |
| Total six years | 338,556,597 | |
| Average yearly | 56,426,099 | |

The above record of production taken in connection with the average yearly cost of Western creamery butter indicates that the output of oleomargarine is influenced by the price of butter quite as much, if not more, than by adverse State legislation.—Am. Grocer.

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THE COLONIAL SUGAR REFINERY'S ANNUAL REPORT.—At the semi- annual meeting of the Colonial Sugar Refining Company, Mr. E. Knox, who presided, stated that on the whole the season's work at the various mills was proceeding satisfactorily, and the yields were somewhat better than was expected. Owing to the policy of the New South Wales Government, the company had cancelled their contracts with the sugar-growers of the colony, and could thus close their mills when they ceased to be profitable. When this was done, the directors would require to write off £450,000. To this sum must be added the losses of other mill-owners, and the depreciation in the value of land through the adoption of the present free-trade tariff, so that the loss which would fall upon the colony through the repeal of the sugar duty amounted to about £1,-000,000. The annual report presented at the meeting stated that the profits made during that period, after providing for interest and all other charges, amounted to £85,301 9s 6d; to which sum had to be added the balance at profit and loss account on 31st March, £89,119 4s 1d; leaving available £174,420 13s 7d. From this amount the board proposed to appropriate to payment of dividend, at the rate of 10 per cent. per annum, free of income tax £85,100, leaving to the credit of the profit and loss account of £89,320 13s 7d. The dividend amounts to ten per cent. on the capital stock.

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An article in the Yorkshire Post on the Colonial Sugar Commissioners' Report, states the position of the Sugar question very correctly. It says: For a good many years now British housewives have been buying sugar at about half the price paid for it elsewhere, and it appears that this was too cheap. The fact that it was too cheap has been known, indeed, to statesmen for some time. What they have not known, or have not labored hard to realize, was that in the end something must be refunded. The obligation has come upon us in a form peculiarly insidious and agreeable. We have cheap sugar mainly because nearly half the actual price of it is paid for foreign Governments. In order to make it possible for their farmers to grow beets at a profit, France, Germany and Austria pay very large sums by way of bounties to those cultivators; and they grow beets so industriously that, after supplying their own people with sugar at high prices, they can afford to sell what remains for little in the free and open markets of this country. It is not to them that we have to consider ourselves in debt. But in accepting their surplus sugar and sharing the benefit of their ample bounties, we have connived at the ruin of sugar-planters in those countries where cane, not beet, is still the crop, and there are no bounties to recompense the fall in price. From the West Indies a bitter cry for countervailing bounties has long gone up, and successive Governments at home have had to harden their hearts. The cane industry of the West Indies, however, on which the greater part of a dense population depends, is now at the point of extinction, and we cannot much longer refuse to put our hands in our pockets. For if we decline to help that industry by means which do not accord with British theories of trading enterprise, we shall still have the population engaged in it upon our hands. It is possible that in course of time the islands might develop other industries; but this would be a slow process, and meantime they cannot be allowed to starve.

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## *A PROSPEROUS REPUBLIC.*

The biennial reports of the various departments of the Republic of Hawaii have been presented to the Legislature, which is now in session. They contain a vast amount of information regarding the financial, commercial and industrial condition of the Republic, and indicate a steady growth in each leading branch of the public service reported. We find in them the income and expenditures, the amounts spent for improvements in the matter of roads, bridges, wharves and other public works, as well as the cost of sustaining a national system of education, free to all youth of every class or nationality. To prepare these statistics and to present them in an intelligible shape, so that every reader can learn the details sought regarding them, is a labor which can only be done by those who have made it a study, and thoroughly understand the subject. No one interested in the prosperity of Hawaii will fail, in examining these reports, to find evidences of national growth and prosperity. Take first that of the Minister of Finance, which gives in detail the receipts and expenditures of the public service for the two years ending December, 1897.

| | |
|---|---|
| Receipts from all sources, including a balance of $22,496.30 from the previous biennial period, were | $4,186,644 97 |
| The expenditures for the same period were | 3,828,575 51 |
| Leaving a surplus balance on hand of | $ 358,069 46 |

The sources from which this income was derived are:

| | |
|---|---|
| Customs revenue | $1,365,388 87 |
| Taxes on real and personal property | 1,458,547 83 |
| Internal revenue from licenses, rents, land sales, etc. | 1,340,211 97 |

The national debt of the republic is given as $4,488,881, on the 31st of December, 1897, or a little more than the biennial revenue. This includes deposits in the postal savings bank, on which interest is paid by the government. The rates of interest now paid on the public debt are five and six per cent. per annum. The total amount of interest paid on this account for 1897 was $243,492.

Minister Damon proposes to refund and consolidate the public debt at a lower rate of interest. A large part of the whole of it may in this way be held here, instead of in America and Europe, with considerable saving to the government, and profit to local trade.

The old issue of treasury certificates, or paper money, payable in silver, has been called in during the last biennial period, to the amount of $262,500, leaving $49,500 unreturned. This balance may never be presented for redemption, as the loss of paper money, in various ways, is as great as that of coins; and in a group of islands like ours, both kinds are ever disappearing, probably faster than in Continental countries. After another biennial period has passed, the amount remaining unclaimed may as well be set down to profit and loss account.

The tables which accompany the Minister's report furnish full details of the sources from which the taxes are gathered, showing every item, and comparisons with the figures of previous financial periods. Then follows the statement of Mr. J. Shaw, Tax Assessor and Collector, with details of the work in his bureau. He estimates an increase in the public revenue from this source, during the current biennial period, of about ten per cent. But judging from the influx of foreign population, and the steady growth in every branch of industry, the increase will undoubtedly exceed any estimate that has been made.

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The annual report of the Collector-General of Customs is always looked for with special interest as furnishing one of the surest evidences of our national prosperity, as similar data relating to imports and exports are relied on in every other country. This service during the past year has been in charge of Mr. F. B. McStocker; and it affords pleasure to say that the exhibit presented by him has never been surpassed for clearness of detail by any former incumbent of this important bureau of the government, although the general form of previous administrations has been followed, in the preparation and arrangement of the statistics.

Foreign merchandise imported shows a gain of $1,618,975 over the previous biennial period, about one million of which was entered as free goods under the reciprocity treaty with the United States, the total of this class having been $4,318,944. A stronger argument to show the beneficial operation of this treaty in favor of the United States could not be desired, as it indicates very clearly that ultimately the bulk of our Hawaiian trade will be with the mother country, such goods only as cannot be procured there being imported from other countries.

The following table shows what our exports were during 1897:

| Products. | | Quantity. | Value. |
|---|---|---|---|
| Sugar | lbs | 520,158,232 | $15,390,422 13 |
| Rice | lbs | 5,499,499 | 225,575 52 |
| Coffee | lbs | 337,158 | 99,696 62 |
| Bananas | bchs | 75,835 | 75,412 50 |
| Wool | lbs | 249,200 | 21,308 84 |
| Hides | lbs | 241,886 | 87,545 48 |
| | pcs | 20,100 | |
| Pineapples | cr | 1,640 | 14,423 17 |
| | pcs | 116,715 | |
| Goat skins | pcs | 6,085 | 2,055 00 |
| Sheep skins | pcs | 9,907 | 2,711 95 |
| Tallow | lbs | 9,000 | 225 00 |
| Molasses | gals | 33,770 | 2,892 72 |
| Betel leaves | bxs | 145 | 509 00 |
| Taro flour | sks | 218 | 267 50 |
| Plant and seeds | pcs | 40,754 | 1,740 65 |
| Sundry fruit | bxs | 504 | 572 00 |
| | pcs | 8,250 | |
| Awa | pk.g | 6 | 27 49 |
| Bones and horns | pcs | 105,235 | 665 80 |
| Curios | pkgs | 26 | 588 50 |
| Canned fruit | cs | 115 | 347 90 |
| Sundries | pkgs | 51 | 1,708 21 |
| Honey | cs | 476 | 4,993 00 |
| | lbs | 53,020 | |
| Foreign | | | 88,086 21 |
| Total | | | $16,021,775 19 |

The value of the combined imports and exports has been:

| | |
|---|---|
| Imports from all countries | $ 8,838,203 09 |
| Exports | 16,021,775 19 |
| Total Foreign Trade of Hawaii | $24,859,978 28 |

The number of vessels (steam and sail) engaged in Hawaiian foreign trade during 1897 was 427, with a total tonnage of 513,-826 tons. Of these, 286, with a tonnage of 270,075 tons, were American, 84 British, 41 Hawaiian, and 16 of other nationalities. The predominance of the American flag in the foreign trade of Hawaii is noteworthy. This is the only foreign country on the globe that can present such an exhibit—where American shipping surpasses that of all other countries combined. In this respect Hawaii may be justly termed the child of America, and loyal to her mother country's flag.

The fleet of Hawaiian vessels afloat—including steam and sail—numbers 62, with a tonnage of 34,066, averaging about 550 tons to each vessel, nearly one-half of the fleet being steamers, employed mostly in the inter-island coasting or foreign trade.

The foreign passenger traffic has increased during the past year, owing to the frequent arrivals of large trans-Pacific steamers that connect Honolulu with Australia, New Zealand, China, Japan, Vancouver and the various American ports on the Pacific coast. This group is also becoming better known as a desirable health resort, unsurpassed by any locality in this ocean. The numerous large and very comfortable foreign steamers that now touch here every week afford accommodations for travelers not surpassed on any other routes. The passenger arrivals during the past year have been 11,379, and the departures 6,504, showing an excess of nearly 5,000 persons. With these frequent additions to our population during the past few years, it is believed that the present population of this group is not less than 120,000.

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## *NO BOSSISM ALLOWED IN THE NEBRASKA BEET SUGAR INDUSTRY.*

Some of our exchanges state that Mr. Oxnard, who controls one or two beet sugar factories in Nebraska, in which the New York Sugar Trust is said to be interested, inserted a clause in his contracts with the beet sugar growers of that State, that in the event of the annexation of Hawaii to the United States, they should be paid half a dollar less per ton for their beets, and in this way they were to be punished for the sins of the law makers in Washington. If the treaty was defeated, then they would receive the same pay that they received last year—four dollars per ton. His object, no doubt, was to create a prejudice among the farmers against Hawaii, with the view of thus defeating the treaty now before Congress, and if the treaty passed, punish the farmers to the tune of half a dollar on every ton of beets that they raised. No honest man would ever have stooped to such political trickery, in business matters, especially when the issue did not concern the beet farmers any more than wheat or corn farmers, all of whom believe in the old Saxon rule of "live and let live."

The sturdy farmers of Nebraska, who have seen as much of the world as Mr. Oxnard has, and have learned a deal more, —some of whom have been in Hawaii—met together in mass meeting, and resolved not to plant beets on any such iron-clad, political contracts as those proposed by him. They hold that Nebraska is a free state, where every man may act as his judgment dictates, and they will not be bound by any political boss, as he proposed doing. Not an acre of beets would they plant on such terms. It became simply a question whether his beet factory should remain closed or not. The result was that Mr. Oxnard backed down, was compelled to call in his form of contracts, and issue new ones, with the offensive clause eliminated. The farmers let him understand very clearly that Hawaiian annexation and Nebraska beet farming were two very different things, and that they were entitled to the same freedom of opinion on political matters as he was.

The intelligent farmers of Nebraska know well that Hawaiian sugar does not now come in conflict with their beet sugar industry any more than does Russian beet sugar, and cannot injure them during the next fifty years, if it ever does. The lesson, however, which they have taught the politicians will have a good result, and tend to curb any efforts that may in future be made to dictate a policy to beet farmers. Factory men have their own political opinions, and are entitled to hold them; but they have no right to bulldoze farmers, contrary to their better judgment. Had this proviso been accepted, by the farmers, it would have put into the pockets of the factory owners a profit of $30,000, more or less.

## *THE GUATEMALA COFFEE DISEASE.*

Frequent reference has been made in our exchanges to a new and very dangerous disease which has attacked the coffee plantations of Guatemala and other parts of Central America and the West Indies. In last year's volume of the Planters' Monthly (page 230, May, 1897), will be found a letter referring to this disease from Mr. W. J. Forsyth, who visited these islands some ten years ago, and wrote a full report for the government regarding coffee planting in Hawaii. His last year's letter did not furnish a full description of the Guatemala disease, but it contained the opinion of the government entomologist at Washington that it was what is called Stilbum Flavidum, a disease that is well known in Costa Rica, Jamaica and Venezuela, for which he could suggest no remedy. Owing to this disease, Mr. Forsyth was compelled to abandon his plantation in Guatemala, and went to Mexico, where no disease to the coffee has yet appeared. His letter referred to above should be read by those engaged in coffee culture.

In the Advertiser of a recent date, Mr. Marsden, Commissioner of Agriculture and Forestry, publishes a communication, in which a more detailed account of this dangerous disease is given, from information received from Washington. We insert the whole of his article, and would caution coffee planters to be on their guard and note its first appearance, should it by any means reach these islands. If introduced by the seeds, the seat of the disease will probably be found located in the roots, and every plant found diseased with it should be dug up by the roots and burned, root and branch, as the surest remedy, till something better is found.

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I would respectfully call the attention of coffee planters to a fungus disease that is seriously affecting the coffee plantations in Guatemala. The following account of this disease has been sent to this bureau from Washington:

"It is a vegetable fungus which is destroying the coffee culture of Guatemala, so that the whole industry in that country is to be given up, unless a remedy is found.

"So far no antidote has been found for this fungus, nor any means by which it can be kept in check. It not only attacks coffee trees, but other plants as well.

"It is first seen as a little brown spot, about the size of a pea, on the leaf. There may be a number of such spots on a single leaf. In the center of each spot is a little orange red growth, about the size of a dot, which under the microscope looks like a little ball on a stem.

"The action of this fungus on the coffee tree is to cause the leaves to shrivel up and fall off, so that the tree is entirely denuded of its foliage, the growing berries also dry up and fall off.

"This fungus clings to seed coffee and may be transported to other countries receiving such seed."

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It would be a wise plan for our coffee planters to refrain from importing seed coffee from any foreign country and any seed coffee for which orders have previously been sent, should be disinfected as soon as possible after being landed on the wharf. This can best be done by immersing the bags containing the coffee in strong lime water, made by putting a large bucket of unslacked lime into 50 gallons of water. After the lime is slacked it should be well stirred up, and the bags of coffee should be immersed in the mixture for at least ten minutes. This method will effectually destroy any fungus spores that may be adhering to the bags or seed.

There seems to have been a great and general desire on the part of the coffee planters to obtain coffee seed from Guatemala and other countries.

There is no doubt but that the trees grown from Guatemala seed have borne crops much earlier than trees grown from Hawaiian seed; but it is by no means certain that the superiority of the Guatemala trees is maintained as the trees become older. As a general rule, trees that bear at an early age, soon lose their vigor and are short lived. We would like to hear from Mr. J. M. Horner on this subject. He was perhaps the first planter to grow the Guatemala trees.

J. MARSDEN,
Commissioner of Agriculture and Forestry.

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## *"SPLENDID SILENCE AND SELF-RESTRAINT."*

Such were the words used by the United States Senator Lodge to designate the spirit in which the American people received the startling news of the destruction of the warship MAINE. Captain Sigsbee, by his bravery, coolness, and wisdom, struck the keynote in his advice to the people "to suspend judgment." This they have done, with a spirit of self-control that puts to shame the sensational journalists.

Captain Sigsbee, while wounded and face to face with a great calamity, and with awful experiences suddenly crowded into a few seconds of time, kept his nerve, and in a cool and collected manner gave his orders, and was the last man to leave the ship. His action is in line with the history and tradition of the American Navy. It reminds us of the spirit which controlled the immortal Washington in times of peril and trial such as few of the world's leaders ever encountered.

Yesterday the nation celebrated the anniversary of Washington's birth, and in doing so we all felt that the "spirit of '76," which dominated the Father of His Country and his associates, still dominates the American people.

Sad and terrible as the disaster in Havana harbor may be, it has its bright side, in that it demonstrates to the nation that it can maintain a "splendid silence and self-restraint" under the most trying circumstances; that it will maintain its dignity, assert its rights, stand for truth and equity, and fight for the Flag whenever it is assailed, remembering: "Thrice is he armed that hath his quarrel just."—Am. Grocer.

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## *LARGE TANKS FOR LOW GRADE SUGARS.*

EDITOR HAWAIIAN PLANTERS' MONTHLY:

The question of pumping massecuite, and of crystallizing low grade sugars in large tanks, has created so much discussion, both here and in Louisiana, that some notes on this subject may not be amiss.

During the early part of last August, a large tank divided into three compartments, was put in for the crystallization of No. 3 sugar. The tank is placed so that the massecuite will run direct to the centrifugals; but as it is too high to be filled by gravity, a cold water Blake pump is used for this purpose.

Prior to the discharge of the molasses, the pump and connection pipes are heated to about 200 deg. F. The strike is then pumped through about 50 feet of pipe to the tank, each compartment of which holds three strikes.

On one occasion a strike was pumped into the first compartment without heating the pump or connections. This massecuite worked slowly in the centrifugals (owing to fine grain), and could only be dried by taking very small charges.

In filling up the second and third compartments, both pump and connections were thoroughly heated before strikes were discharged. The massecuite in these compartments has crystallized splendidly, and is solid to the top. Samples of the massecuite and sugar gave the following analyses:

Massecuite.

| | |
|---|---|
| Total solids | 86.00 |
| Sucrose | 51.40 |
| Glucose | 12.25 |
| Purity coeff. | 59.75 |

Sugar.

| | |
|---|---|
| Moisture | 2.46 |
| Sucrose | 37.20 |
| Glucose | 3.45 |
| Ash | 2.6692 |

Large tanks are to be recommended, as they are cheaper than cars or coolers, and require less room for quantity of massecuite stored. The sugar is of more uniform quality, and crystallizes better than in coolers kept at mill temperature. The mechanical loss is less, and the expense of handling reduced.

The trouble experienced in other mills was caused by too rapid cooling of the molasses by coming in contact, in relatively small quantities, with the cool metal surfaces of the pump and pipes.

All difficulties in handling molasses by means of a pump can be obviated by thoroughly heating both pump and pipes, prior to the discharge of the strike. The molasses in passing through the pipe to the tank will be heated to a slightly higher temperature, and will not suffer from too sudden cooling in the tank. The pump should be of good size, say 4 inch suction and 3 inch discharge for 8x10 ft. compartment; if larger, use one of proportional size.

Some years ago the writer had occasion to use a tank 20x20x4 to 5 ft. without compartments. It was filled by means of a spout, this gave such good results that I have ever been an advocate of large tanks for low grade sugars.

EDWIN E. OLDING.

Union Mill, Kohala, Hawaii, March 17th, 1898.

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An orchard in Gloucester, Eng., of 200 acres, was a complete failure in fruit-bearing, until a Scotch bee keeper put in 50 hives of bees, when the orchard began to bear heavily.

## *DRAINING OF EVAPORATOR AND VACUUM PAN COILS BY THE MARSH PUMP.*

EDITOR HAWAIIAN PLANTERS' MONTHLY:

Mr. O'Dowda, in his letter which appeared in the February number of your journal, claimed to be pumping condensed water at 230 deg. Fah. from coils into the boilers. In fairness to your correspondent, I took this to be a printer's or other error; but as I do not find any correction of it in your March number, I feel compelled to return to the subject, without further wishing to prolong the discussion, and will therefore only point out that in order to heat water to a temperature of 230 deg. Fah., there must be a pressure of 6.3 pounds per square inch on it, so that all the heat used in the vacuum pans at Ewa is that due to the difference in temperature between 55 pounds and 6.3 pounds pressure, and no advantage whatever is taken of the latent heat, which is the governing principle in evaporation by steam. I might further call attention to the fact, that unless water be reduced to 212 deg. Fah., the temperature at which it began to absorb latent heat, a very great loss of heat will result, as it takes five times as much heat to convert water into steam, as it does to make it boil, which heat is given off again, in the converse process of converting steam into water.

Respectfully yours,

JAMES SCOTT,

Chief Engineer.

Makaweli Plantation, Kauai, 1st April, 1898.

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## *A STRONG FRIEND OF ANNEXATION.*

Henry A. Brown of Westport Point, Mass., has long been known as a strong opponent of the reciprocity treaty between the United States and Hawaii, and has written some very powerful articles against us. There is not in the United States a man who has studied the sugar question in all its phases more earnestly than he, and whose opinion is more reliable than his. Although he has opposed the reciprocity treaty and still opposes it, he has recently come out very strongly in favor of the annexation of Hawaii to the United States, much to the surprise of many who are familiar with his writings. In a recent article on Hawaii, dated March 21, and published in the Louisiana Planter, he says:

"While, in my opinion, the treaty should long since have been abrogated, or so modified as to prevent the importation of high grades of sugar, far superior in pure crystals to the yellow refined sugars that are sold to consumers, I also know that the importation of high grade sugars duty free, under specious pretences, has been detrimental to American producers of sugar without the least benefit to consumers. The loss of said duty is a burden on the people, for which they receive no adequate return under existing conditions. Our trade with the Sandwich or Hawaiian Islands is the outgrowth of the enterprise of Boston merchants, who first sent ships and merchandise to those islands. The trade with Hawaii naturally belongs to this country owing to the location of the islands, and the facilities for trading with the islands, owing to natural causes, practically bar other nations from monopolizing the trade. Hence, the admission of sugar from those islands duty free was a blunder from its inception, our claims under the treaty being practically the same as those of Great Britain and Germany, for which those nations give no adequate trade return, while we have been paying the islands millions of dollars per annum for privileges that other nations have for nothing. In fact, if there is any good reason why this country should annex the islands it lies in the fact stated herein. * * * Annexation would give this country ownership, and money expended by gift or for improvement in Hawaii would be expended on our own property, and not as now, be thrown away upon the islands practically for nothing.

"Sugar producers in this country strenuously oppose annexation on the ground that sugar being the principal product of Hawaii would come in duty free and would injure or destroy the present home industry. As well might our wheat growers object to the admission of a wheat growing State; but the strangeness of the objection is that under the existing treaty Hawaiian sugars are admitted free and annexation would not change the existing condition a particle. It is reported in the press that a prominent leader in home beet sugar production issued a notice to sugar beet growers that if annexation occurred his factories would not pay more than $3.50 per ton for beets; if annexation did not take place, $4 per ton would rule, subject in either case to sugar contents of the beets. Little wonder that farmers refused to sign contracts to raise beets under such dictation. It probably occurred to farmers that

Hawaiian sugars are admitted free of duty under the existing treaty and the evil could not be enhanced if the islands were annexed.

"The contention that Hawaiian sugars would hinder production in this country is contradicted by the fact that such has not been the case under the treaty and would not be with annexation more than now. Sugar can be produced in Hawaii of the grades now imported free for less than 2 cents per pound, but the market price of such sugars in New York and San Francisco is based on the market price of cane and beet sugars of similar grade imported from other countries plus duty. The profit goes to Hawaiian planters and their agents and to the sugar refining company and their allies, hence our beet sugars are not specially affected by Hawaiian sugars, but to get better profits the cost of producing beet sugar in this country must be reduced and will be. This desired profit does not depend on the product of Hawaii, but upon progress in sugar making. What nature and cheap labor has bestowed on Hawaii in this regard must be equalized by the persistent employment of brains, capital and skill, aided by improved methods, wherein we excel and on which we must depend.

"One most important point in this relation refers to the fears or pretended fears that the sugar product of Hawaii is likely to interfere with our progress if the islands are annexed. Setting aside the fact that under the existing treaty the condition as regards sugar is as bad as it can be, there are good reasons why the production of sugar in Hawaii has approximated the limit of her capacity of production in the line of sugar. Be that as it may, the demands of consumption in this country are at present far beyond our present capacity of production and increasing far more rapidly than our sugar production is at present increasing. Hawaiian sugars are and will continue to be but a drop in the bucket compared with the demands of consumption. With the most rapid progress possible and with reasonable tariff protection, producers of sugar may increase a hundred-fold and still are not likely to reach, much less outstrip, the demands of home consumption for very many years to come.

"The consumption of imported sugars free and dutiable entered for immediate consumption and withdrawn from warehouses for consumption in the year ended June 30, 1897, was 5,347,410,981 pounds, or 2,387,237 tons of 2240 pounds. Of this amount there was of Hawaiian sugars duty free 431,306,359 pounds, or 192,547 tons of 2240 pounds, from official reports. The production of cane and beet sugar in the United States in the year named was 740,007,400 pounds, or 330,356 tons of 2240 pounds, of which 289,009 tons were cane sugar and 41,347 tons of beet sugar, official report. Thus it appears that in the year named the total consumption of foreign and domestic sugar in this country was 6,087,418,381 pounds, or 2,717,593 tons of 2240 pounds; population the year named, 72,807,000 (official), making the consumption of sugar 83.75 pounds per capita in the year named.

"Of the vast amount of sugar now annually consumed in this country, the imports from Hawaii are too small for home producers to worry over, and the enormous quantity required for consumption affords opportunity for the production of beet and cane sugar in excess of our enormous consumption. If the existing treaty with Hawaii can only be killed by annexation, sugar producers may accept annexation with equanimity." HENRY A. BROWN.

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## *AGRICULTURE IN CUBA.*

(Journal of the Jamaica Agricultural Society.)

The following are extracts from a report by the British Consul regarding the trade and commerce of the Consular district of Havana:

The following remarks on the sugar industry have been mainly furnished to me by Mr. Skaite, of the University of Heidelberg, an expert on the subject now resident in Cuba, and may be found to be interesting at the present time when so much attention is being displayed in England to the sugar trade.

As was expected, the sugar crop for 1896 has been a very small one, even as compared with the output for the previous year. The total production of sugar in 1896 amounted to 225,221 tons, as against 1,004,264 tons in 1895, thus showing a deficit of 779,043 tons, or 77.574 per cent.

Cuba in normal times may be said to be one of the most favored countries of the world for the economical production of sugar. The present condition of affairs greatly burdens the sugar industry, owing to the necessity of protecting the estates, the loss of cane through incendiary fires, and the difficulty at all times of getting enough hauled to the works to use them to their full capacity.

Under normal conditions the contrast between the Cuban industry and that of the Western Indian Islands, or any American sugar-producing country, is remarkable. The total sugar crop of any other island is equal only to the output of three or four of the largest Cuban manufactories, and with the exception of Demerara all those countries show considerable inferiority to Cuba in methods of manufacture and in the class of machinery in use. The neglect of the other West Indian planters to advance with the times is the main cause of this lack of prosperity at the present moment. Of the other cane-sugar countries of the world Java is the only one which comes within 50 per cent. of the amount of sugar produced annually in Cuba in normal times, and Java and the Hawaiian Islands are the only ones which are generally advanced in the process of manufacture.

Until a very recent date the manufacture of sugar and the growing of the cane in Cuba were extremely profitable undertakings, and the reasons for their prosperity may be stated as:

1. The excellence of the climate and the fertility of the soil, which allow of large crops of good cane. The rainfall, about 50 inches, is so distributed that irrigation is not a necessity, though it would in many cases be advisable.

2. The great movement towards the centralization of the estates which took place in the early eighties; planters having understood the value of large sugar-houses, and overcome their difficulties in this way.

3. The proximity of the United States, affording as it does a cash market for the sugar.

It is a matter of surprise to many with experience in other sugar-producing countries that, even with the above advantages, the Cuban sugar crop should have reached the great amount of 1,000,000 tons, for while elsewhere the sugar industry is fostered by bounties, as in Europe and the United States, by special treaty with the country where the sugar is sold, as in the Hawaiian Islands, in Cuba the growth of production is hindered by direct taxation, and by enormous duties on the various necessities of manufacture. Besides this the want of ordinary roads and bridges is severely felt at times. Further, the freight charged on railroads and coasting steamers is excessively high.

The Cuban grinding season lasts from about December 31st, until the spring rains begin about May 15th. During this time very little rain falls, and the crop may be harvested without damaging the roots of cane—a very important consideration where land will continue to yield well for from 8 to 25 years without replanting. The crops vary from 40,000 to 120,000 arrobas per caballeria, or from 12 to 50 tons per acre, and the cane contains from 13 per cent. sugar in December up to 18 per cent. in March and April. The manufacturer's aim is, therefore, to begin as late as possible in order to profit by the refining of the cane. Very little manuring has been tried yet, and in a few places only is there any well-conducted cleaning of the fields in the dead season, or proper ploughing before planting. Old wooden ploughs prevail in many districts. No irrigation works of any account exist, and no trials of any scientific value have yet been made to determine the kind of cane best suited to the soil and climate. In fact, the natural agricultural advantages of the country have been relied on up to now, and have been found sufficient to ensure large profits. Most of the cane is transported to the sugar houses by narrow-gauge roads built for this purpose, and are often from 10 to 40 miles in extent and connecting with the main lines. Transport by means of flumes or canals is not known. The cost of producing sugar in Cuba may be said to be an unknown quantity in respect to the great bulk of the estates, owing to their lack of commercial organization, but it may be said that a great many can make sugar of 96 degrees for about 2 c. per lb. at the sugar-house, and that a few can do it for less. The great factors in the cost of production in any sugar-house are:

1. Cost and quality of cane, or value of sugar in the cane.
2. Daily capacity of sugar house.
3. Price of labor and method of manufacture.

The cane in Cuba is paid for in certain percentage on its weight of "first" sugar, or the cash value of this sugar at the time of delivery of the cane. This is a very equitable and scientific arrangement, and compares favorably with anything in vogue even in beet-sugar countries. The amount of sugar varies from 4 to 6 arrobas per 100 arrobas of cane, an arroba being equal to 25 lbs.

In respect to daily capacity, the Cuban sugar-houses are in advance of those in any other country. Very many can grind 1,000 tons of cane in 24 hours, and not a few can do more than this. There are a few places in France and Belgium, known as "Usines Centrales," where the juice is conveyed by a system of pipes from small juice stations to a central establishment, which equal or excel the Cuban houses in capacity, but elsewhere there are none so large.

The cost of labor in Cuba is not high. An ordinary laboring hand earns from 12 to 20 dollars per month, according to the season of the work, and is fed and lodged besides. They are lodged in "baracoons," or great sheds of the most primitive kind, in which hammocks are slung, and are fed twice a day on rice and beans, and beef usually, and eat their food sitting on the ground, or are furnished with rough benches or boards. The Spanish laborer expects little. Withal, he is a peaceful, temperate, and hard-working man as a rule. Chinese labor is used to a considerable degree, but it is not cheaper than black or white labor. The Chinamen are all old men, formerly coolies, and as there is not any fresh immigration at present, they are becoming scarcer. The cross between the Chinamen and the negroes is a good one usually, but they do not as a rule, live much past middle age.

The black laborer in Cuba is undoubtedly a stronger man physically than the white, and very much superior in this respect, and in most others to the Louisiana negro coming from a different part of Africa.

The methods of manufacturing in Cuban sugar-houses are good as regards the kind of machinery used. Immense sums have been spent in the last ten years in this direction. The mills, evaporators, vacuum pans, and centrifugals are usually first-class, but the general internal management of the sugar-houses leaves much to be desired except in a few instances. A good deal of sugar is lost by crude methods, and in very few places is there exercised that chemical control which has brought the best of sugar-houses to their present state of perfection.

Considerable advance will doubtless be made in time in the control of the sugar-house and the growing of the cane, and, with good administration, it is likely that Cuba will soon again become the largest cane-sugar-producing country in the world.

## TOBACCO INDUSTRY.

The prospective scarcity of tobacco in Cuba will probably cause the export of this article from Mexico and other tobacco-producing countries to increase, and though tobacco grown in these countries cannot in any way compete with that produced in the province of Vuelta Abajo and Habana, there is always a good market for tobacco of inferior quality, such as that known in Cuba as Vuelta Arriba, in Bremen, Hamburg, and Antwerp. There is now, therefore, an opportunity for countries where both soil and climate are favorable for the growth of the plant to induce planters who are familiar with the cultivation of tobacco to make trials on a moderate scale, and to ship their produce to the markets offering the best prospects for a profitable sale, and those as before mentioned, are Bremen, Hamburg, and Antwerp. Consignments of tobacco are handled with great care at these ports, and the consignees on receipt of the first trial shipment would then be able to point out to the planters any defects which may have appeared in the tobacco. In this manner many of the British colonies in the West Indies, where the climate is suitable for tobacco culture, could gradually succeed in producing tobacco of such quality as would meet with a ready sale in the above markets.

## CATTLE INDUSTRY.

The total number of cattle in Cuba (including pigs and sheep) was 3,708,187 in 1891. In the past two years, however, the number of cattle has greatly decreased, owing to the amount slaughtered daily for the supply of 200,000 troops, and to the herds which have been captured and driven into the mountains by the rebels for their own use.

In the city of Havana the price of meat has been steadily rising for the past six months, and this is also the case in the country towns. Hitherto the Spanish troops have been served with rations of fresh beef every day, and for this purpose draught oxen as well as slaughter cattle have been killed, and it is probable that before the end of 1897 the soldiers will have to fall back on tinned meats, which are easily procurable from the United States. After the rebellion of 1868-78, the duties on cattle entering Cuba were removed for three years, and a decree was also passed making it a penal offense to kill either cows or heifers.

It is supposed that when peace is restored here the Government will find it necessary to adopt the same plan, and the source of the future supplies will probably be Jamaica, the

Spanish Main, the districts of Orinoco, and Florida. These countries, by their proximity and similarity of climate to that of Cuba, would naturally appear to be the most probable sources of future supplies, as cattle coming from colder climates do not acclimatize easily, and are very subject to disease. The duty on entry as it now stands is very high, being, for geldings and mares, 85 dol; mules, 32 dol; oxen, 22 dol; cows, 10 dol; calves, heifers, and steers, 8 dol; and pigs, 7 dol; besides other additional charges on landing. In view therefore of the future demand it would be well for cattle-breeders in Jamaica and elsewhere to be prepared to negotiate with the Government of Cuba for the export of cattle, should the tax again be removed.

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## *SECRETARY WILSON'S VIEWS ABOUT FLORIDA.*

Secretary Wilson, who is the head of the Agricultural Bureau of the United States, has recently made a tour of observation through the State of Florida. He stated the result of his observations to the Associated Press as follows:

"Within the last few years," he said, "40,000 Cubans have come over from that island, many of whom had been life-long tobacco growers, curers and cigar makers. They understood the art from the planting of the seed to the marketing of the cigar. Florida lands may be generally divided into two classes: pine lands and hummock lands. Northern people will most readily understand what hummock land is by telling them that it is land upon which pine does not grow, but all other kind of woods indigenous to Florida do grow. It is a heavier, blacker soil than pine land. Cubans recognized it as being very similar to that of the best tobacco lands in Cuba. The American 'caught on' to the business very rapidly. He employed the Cuban and studied the art as he observed the processes through which tobacco growing, curing and cigar-making went. The statistics of the State show that Cubans sold last year 160,000,000 cigars, and that the sales of tobacco in all its forms brought Cubans $13,000,000. The United States still pays to Cuba, Sumatra, Mexico and other countries, $17,000,000 for tobacco in its various forms. These $17,000,000 the Floridian is reaching out for. It is a part of the $400,000,000 worth of soil productions brought into this country annually, and the Department of Agriculture is greatly interested in making a study of the methods by which Florida people are endeavoring to gather in that $17,000,000.

"The Cuban makes his cigar from plants, the seeds of which he imported from his native island. He will not touch the Sumatran, Mexican, or any other kind of tobacco, regarding the productions of the Cuban seed as ample to make the finest cigar. The American, however, is not content until he has exploited everything pertaining to tobacco and cigar-making, and so he imports the Sumatra seed and grows Sumatra tobacco, which has a very thin, fine, silky and delicate leaf, substantially without flavor as it comes from Sumatra and only used for wrapper. A cigar could not be made from Sumatra tobacco as it is imported. But the Floridians have a tradition that before the war, the Dutch from Amsterdam bought Florida tobacco leaf and took it to Sumatra, which they controlled, and there it lost its original strength and flavor, while it developed a still finer, silky wrapper leaf. They tell us that now, when the seed is brought back again from Sumatra and grown in Florida, it gradually acquires the same strength and flavor.

"Be this as it may, it is pretty well established that the people of the United States get 160,000,000 cigars annually from Florida. The figures of the internal revenue officials will prove that to any one at any time. Scarcely such a thing is to be found on the market, however, as a Florida cigar. They all come North under the Havana name. They are well aware that they are supplying a very large share of the demand for Havana cigars."

The Secretary says he found very much the same condition of affairs in the North regarding the Florida cigar as he found in London regarding American butter. The consumer in London is well satisfied that the American butter is the finest that ever went on his table, and so testifies over his name. The Northern epicure, after smoking his cigar, will testify very readily that nothing equals his fine Havana; he will give testimonials to that effect. Then if you have evidence to prove that it was grown, cured, and manufactured in Florida, you will have him, but not otherwise. We are just as much prejudiced in favor of the Havana cigar as the Londoner is in favor of the English or Danish butter.

The Secretary said that he made efforts to buy a box of Cuban cigars, grown, cured, and manufactured in Florida, but in only one instance was he able to do so.

The Secretary says that in connection with the tobacco industry, he was forcibly reminded of the work that has been done during the last few years by the Experiment Stations in mastering the principles that underlie the flavoring of butter and the ripening of cheese. After the tobacco has been grown, it is fairly well understood that fermentation along several lines produces the characteristic flavor of the product, and just as several cheeses are given their peculiar taste through bacterial action, so, unquestionably, tobaccos grown and manufactured in different sections of the country are flavored by different kinds of bacteria. This, however, has never been demonstrated by anybody.

After the Secretary had made himself somewhat familiar with the methods pursued in different localities by both Cubans and Americans, and learned that neither knew anything whatever about the several tobaccos, he naturally turned his steps toward Lake City, where the United States Experiment Station is located, to ascertain whether the people at that institution had a realizing sense of the requirements of the occasion; in other words, whether they had set themselves to work to discover the principles that underlie the several stages through which tobacco goes from the time it is cut in the field until it is a presentable cigar.

"Happily, the Lake City station has for its professor of agriculture at the present time an exceedingly well-educated, widely traveled and very energetic man, Dr. Stockbridge. He fully realizes the requirements of the situation. He has inaugurated a series of research regarding fertilizing and what goes on during the process of fermentation.

"The Florida soil, like the soil of all hot, rain countries, has the humus washed from the surface downward. It is a quick and responsive soil, however, but perpetual cropping, with two or three crops a year in many cases, tends to take the fertility out of the soil. Just what tobacco requires is not absolutely well known, because, like many other productions, the principles that govern it have not been demonstrated by scientific men. Nitrogen, potash, and phosphoric acid, of course, are required. Phosphoric acid is in Florida in abundance every-where. Nitrogen can be had through growing leguminous crops, cowpeas, velvet bean, etc. But the potash must come from the Stassfurt mine, in Germany."

The Secretary wonders whether any of our salt mine owners have turned their attention to the mining of potash. It is found at the Stassfurt mine, below the salt deposits. The query suggests itself. Is it not found in the United States below our salt deposits? If so, it will be a very profitable industry very soon. The tobacco raiser must have it. He can get it, of course, from wood ashes, but there is not enough wood ashes made in any State fully to supply the requirements of the tobacco plant.

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## *SUGAR BEETS IN THE WEST.*

George Austin, agricultural superintendent of Lehi, Utah, Beet Sugar Co., was recently in Eddy, N. Mexico. He was accompanied by J. H. Wolf, of Lincoln, Nebraska, who has acted as chemist at the Lehi factory the past year. It will be remembered that Mr. Austin, visited the valley in the spring of last year and gave the farmers practically their first lesson in the cultivation of their beet crops. He is a most competent man, well versed in the business in which he is engaged, and one whose opinions, being the result of much study and close observation, are of the highest worth and importance.

He has been making a tour of the different beet districts of the country, and made Eddy the last place before returning home.

The past season at Lehi was not the most prosperous, and the purpose of Mr. Austin's trip was evidently to see how the conditions are this year compared with those existing elsewhere.

When seen by an Argus representative, Mr. Austin had no aversion to giving his opinion of the campaign closed, or now drawing to a close in the different localities, and in response to the query as to the reason for the shortage of crop and the apparent unfavorable conditions which have encumbered the beet industry this year, replied most emphatically that it was an "off year."

"It was due almost wholly to climatic influences," he said. "Just as potatoes will in certain years prove a failure, though given the same care and attention accorded them in years of success; just as smut will in certain years attack the wheat; just as the apple and peach crop will, without apparent cause, fail to produce, so it has been this year with the beet crop, and the shortage has been confined to no particular section, it has been general.

"Lehi," he said, "had only about 60 per cent. of a crop. Last year the acreage there was 3380, and averaged about thirteen and a half tons to the acre. The factory was supplied with more beets than it could use. Accordingly, this year the acreage was decreased. Three thousand acres were contracted for. Of this 250 were lost, and with the unfavorable conditions—the lack of rain, the excessive winds, the bugs, etc.—the supply was insufficient, the average yield per acre being from seven to eight tons.

"It was not a matter of seed," said Mr. Austin, "nor a lack of proper condition. All the varieties of seed were equally disappointing in their results. It was an off year, and so I found it in California, from where I have just come. The crop at Chino was estimated to reach 120,000 tons. Only 90,000 were secured, the average yield being about seven tons."

In this connection it is not out of place to quote from a letter by Manager Cutler, of the Lehi company, regarding not only the condition of the beet crop for this season, but other crops as well, evidencing that the responsibility for curtailed results charged to an "off year," is well taken. Manager Cutler says:

"It is to be very much regretted that the beet crop of Utah and some parts of California has been a partial failure this season, though, in talking with beet growers generally in other lands, provisions have generally been made looking to a partial failure about once every seven years, which at present naturally affects beet crops. I find that even the same cause that affected the beets this year also affected the grape crop of California. The saccharine qualities contained therein have very naturally deteriorated, and the wines were never so low in price as now, the quality of the ordinary kind being poor. I talked with several grape growers during my recent visit and they told me that all that is offered for ordinary wine is about ten cents a gallon, and the industry is very unproductive at that."

Continuing, Mr. Austin said: "In this valley I find a short crop, and some disappointment is the result. Let me say to the people, and more particularly to the farmers of the Pecos Valley, that there is no occasion for discouragement. I have investigated the condition of the valley most thoroughly. Beets will grow here in great richness and give a bountiful crop. This year growers were pitted against a combination of circumstances against it was not in the power of man to cope. The results here for the two years of the factory's existence have been as good as the results of first years in other districts. The average yield per acre at Lehi for both the first and second years was only seven to eight tons. It required that length of time for the farmers to become acquainted with the crop. After that the tonnage rapidly increased. It is all in the cultivation, and the man who expects to produce a crop by sitting on the fence and watching it grow had better keep out of the beet business.

"Here you have the climate, abundant water, the soil is identical with that of our banner district, and with the careful and constant cultivation which the crop demands, the Pecos valley will be a most exceptional beet producing region. I was most surprised at the appearance of the country. When here before, crops were just starting to grow. Now they are to be seen in full maturity. Down the valley I saw fields of corn twelve and fourteen feet high; and, my friend, let me tell you that corn does not grow to that height on land that is not rich and possessed of great strength.

"There are numerous points which it will be necessary for the farmers to determine here—points almost wholly local, though I believe the system prevalent in Lehi adaptable here, and if I was going to put in beets in this valley would follow that system, for the conditions are almost identical.

"From what I have been able to learn while here, and from talking with farmers, I believe the best results are to be secured by late planting. It is my opinion that the beet rows should be closer together and a uniform distance apart—from 18 in. to 20 in. This allows cultivation of all the rows and on every side of the rows, and it takes cultivation to make a beet crop. This system also tends to permit the shading of the ground by the beet leaves, and in a country where the sunshine is as bright as it is here, this effect should be striven for. I believe also that the ridge system should be done away with, the beets being planted on a level, the irrigation furrows being made at the time of each irrigation. Planted on ridges, too much surface is exposed for the sun to get in its drying and baking powers. Care must be exercised in planting not to get the seed too deep. From 1 in. to 1½ in. is a great sufficiency, and 2 in. should be the maximum depth. Seed put in deeper than this, although it germinates and the beet pushes its way above ground, will never make a crop. It is not the nature of the plant, and you cannot force it to make an unnatural growth successfully.

"One of the secrets of beet cultivation is getting the land in condition just as soon as possible. The ground should be ploughed in the fall immediately the crop is removed. Go down deep, a little deeper each year. Let the ground be exposed during the winter, put it in good condition in the spring, plant properly, cultivate intelligently and unceasingly, and the beet crop will be in every way gratifying and remunerative."

Mr. Austin terminated the interview by saying that "as years of abundance always follow those of dearth, I have no doubt but that the campaign of '98 will find the Pecos Valley, as well as other sections, blessed with an abundant and rich crop, and that those who have not yet been rewarded in the manner anticipated or desired, will then understand that the preceding years were not the school of experience through which it was necessary that they should pass to gain a proper understanding of a crop of which previously they knew nothing, but which when understood is easily the superior of all others, and one which guarantees the farmer a home market and a certainty of income."—Pecos Valley Argus.

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## *WHAT IS SUPERPHOSPHATE OF LIME?*

Every planter has heard this name. Some know why it should be used. A small minority know how to use it. What is then superphosphate of lime, why is it used at all, and how should it be used?

A writer in a Colonial paper answers these questions very clearly. Superphosphate of lime is a soluble compound of phosphoric acid, lime and sulphuric acid. Phosphoric acid is one of the four important—because rarely found in sufficient abundance—elements of plant food. That phosphates play a most important part in plant economy is a commonplace now, but its discovery by Baron Liebig, the founder of agricultural chemistry, was romantic. He found that a certain very fertile wheat district in Sweden owed its remarkably good crops to the presence of a great quantity of decaying bones in the soil. For a great battle had been fought on the spot, and the fields were a huge graveyard. Analysing both the wheat and the bones, Liebig found a large proportion of phosphoric acid in each. The conclusion was inevitable, supported as it was by further tests and experiments, that phosphoric acid was much needed by wheat, and that bones could supply this want. But Liebig also found that raw bones could a very long time to give up all their phosphoric acid. He discovered a way to hasten the process. This was effected by adding sulphuric acid to the bones, which dissolved them into a soft mass called superphosphate of lime.

The outlines of the process are simple enough. You take, say, 620 lbs. of finely ground bones or other phosphates, add 240 lbs. of common sulphuric acid with a little water to replace the moisture driven off by the heat of the chemical action, and the result is 860 lbs. of superphosphate of lime.

In the insoluble raw phosphate, each part of the valuable phosphoric acid was tightly held by three parts of lime (hence called tri-calcic phosphate). The sulphuric acid has altered this little arrangement. This acid has a great attraction for lime, and promptly attacked and possessed two of the three parts of lime that kept the phosphoric acid imprisoned and useless. These two parts of acid and one of lime are now sulphate of lime, of which 3 lbs. are found in every 10 lbs. of the mixture called superphosphate. The phosphoric acid has now only one part of lime (hence called monocalcic) to look after it. In this form it can easily do its natural duty of being eaten by plants.

This duty is a most important one, for no plants can thrive without a sufficiency of phosphoric acid. And the acid must be in such a state as to be easily taken up.

Herein, in its very virtue, lies its danger. The acid, to be taken up by plants, must be soluble in water. Thus superphosphate is perfectly soluble, *i. e.*, melts, like sugar for instance, in water. Consequently any great fall of rain can easily carry it away. Worse than this danger even, is the abnormal fondness lime has for it. So if lime is present in the soil, two parts of lime will at once seize on the phosphate with its solitary lime companion, and convert it into the old useless, insoluble three-part lime phosphate (tricalcic). The two extra parts cannot seize on the phosphate at the same time; the first one does its work very quickly, the other takes a little more time, but effects its purpose of aiding in the imprisonment none the less surely.

Now this little episode in the lives of phosphate and lime explains a great deal. We remember a case where a planter experimented in a large way, and most unsuccessfully, with superphosphates. The fertilizer had not the slightest effect on the plants. He wrote home to the manufacturers abusing them roundly for the worthlessness of their wares. They asseverated that the superphosphates were of the best, and enquired the exact methods of application. Then it all came out. To dry the soft pulpy mass before use, the indignant planter had mixed a large quantity of lime with the superphosphate. Overjoyed at this chance, the merry molecules of lime had promptly imprisoned the phosphoric acid and rendered it useless for the time being.

So that when lime is used at all, it should precede the application of superphosphate by six months at least, to give it time to be changed into carbonate by exposure to the air, soil and rain.

This then is clear. That a wish alone to dabble in chemical fertilizers is not enough, if we desire to obtain the fullest results. We must either ourselves know all about their intricate little ways and methods of behavior or——, we must pay some one to tell us!—Exchange.

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## *DROUGHT IN AUSTRALIA.*

(From U. S. Consular Report for 1897.)

Droughts in Australia are not uncommon. In the most valuable and productive districts, they occur too frequently for the happiness of the inhabitants of this, in many ways, favored land; but the drought from which the country is now suffering is the most severe, prolonged, disastrous, and far-reaching of any visitation of the kind experienced for half a century. Save along the coast and a few favored spots not far inside of the "coast range," the present drought spreads well-nigh over the continental colonies.

As published in a former report, the colony of New South Wales alone lost 9,000,000 sheep during the year 1895, the number being reduced from 56,000,000 to 47,000,000 through the severity of the prolonged drought, while most of the other colonies suffered enormously from the same cause.

The baleful results of the recent drought are intensified by the fact that this may almost be said to be but a continuation of the drought of 1895, as for fully two and a half years there has not been sufficient rainfall in the interior to be considered as a break in the almost changeless dry spell.

In the chief wool-growing colony (New South Wales), not only was there a failure to recover the losses of 1895, but many well-informed persons claim that there had been a further decline during the year 1896.

From the extensive pastoral districts of the interior come reports of the most appaling conditions. During the hot summer months in Australia—December, January, and February—the pastures are dry and the grass dead; but in autumn there are usually rains which cause a fine growth of herbage for the winter months. At this time of year, the feed should be fresh, green, and abundant throughout the whole interior, while, as a fact, throughout the main sheep districts there has been very little rain for many months; in some localities, for almost a year.

From the very nature of its superficial configuration, continental Australia has but a scant rainfall and, owing to the same natural causes, it is very unequally distributed. If the total annual rainfall of the whole Australian continent were equally distributed over the entire area, it is doubtful if it would aggregate as much as 6 inches. The reasons are obvious. Owing to the rotary motion of the globe, the rain clouds, or vapor-laden atmosphere, come chiefly from the eastern seas or basins of evaporation. In every quarter of the globe, the distribution of the rainfall depends upon local influences, chiefly upon mountain chains or land elevations. Some 50 or 100 miles from the coast, and almost parallel therewith, a chain of mountains, or high table-lands, runs along the whole east side of the continent, from about 12° to 38° south latitude, having a total length of nearly 1,500 miles.

While these ranges are low (they average 4,000 or 5,000 feet) as compared with the great mountain chains of other countries, they are sufficiently high to empty the westerly moving rain clouds of most of their rather meager supply of moisture.

In a comparatively small area, east of some of the higher portions of this range, there is quite a heavy rainfall. There is also a district in tropical Australia, west of the Gulf of Carpentaria and north of the Raper River, embracing some 30,000 square miles, having an annual rainfall of from 40 to 50 inches.

A semicircular belt of country, some 400 miles wide and over 2,000 miles long, lying west of the above-mentioned coast range and south of the north shore line, has an average annual precipitation of from 10 to 30 inches, the amount gradually decreasing to 5 inches and less toward the interior. Fully one-half of the vast interior of the continent of Australia, a country with a superficial area of nearly 1,500,000 square miles, may be said to be almost rainless.

The enormous pastoral industry and the princely sheep runs —called in Australia speech "stations"—are inside the mountain and reach out to the dry and withered plains in the semicircular belt with the scant rainfall before described. As it will be observed that the highest average rainfall in any of these interior regions is but a few inches, the loss and distress in a country usually stocked up to the possibilities of the most favorable seasons, caused by the failure of the meager supply of rain, may be easily imagined. Inside of this coast range, in the continental interior and bordering on the dry and rainless plains, are pastured the 100,000,000 sheep and most of the 10,000,000 cattle of Australia.

New South Wales is the wool-growing country of Australia, as over one-half of the flocks of the Australian continent are in this colony. In 1891, there were 62,000,000 sheep in New South Wales alone. But prices began to decline and seasons began to fail, so that at the beginning of the wool season of 1895-96 the number had decreased to 56,000,000. In 1895, came a severe drought, and, as before said, New South Wales in that season lost 9,000,000 sheep, leaving her but 47,000,000.

Now, while 1896 was a better year than 1895, it is doubtful if the numbers more than held their own; it is even doubtful if there were more than 45,000,000 sheep in New South Wales at the beginning of the 1896-97 season. But never, it is said, has the outlook for the sheep raisers been more gloomy than now.

Owing to the enormous development of the artesian-well system, the extensive colony of Queensland has suffered proportionately much less than the other continental colonies. From all parts of South and Western Australia, from Victoria and New South Wales, the reports are disheartening. The feed has been dry and dead so long, and the water has become so nearly exhausted and so poor, that stock is dying by the hundreds of thousands, or even by the millions. Thousands of men are being employed in the various districts cutting the boughs of the apple, the oak, and other trees for food for the starving sheep, and in skinning the animals that perish in the mud at the failing water holes. Autumn and the lambing season has come, and since there is no fresh, wholesome food to nourish the breeding ewes, they are too weak to furnish milk, and the lambs are either killed by the owners to save the mothers' lives or allowed to die with them.

That I might see for myself, I took a hasty run 400 miles southwest into the famous Riverina district, whence comes the fine wools bought by American manufacturers. For miles and miles not a blade of grass, not a green weed or sprig of vegetation could be seen. Sheep, cattle, birds, and rabbits were succumbing to the awful ravages of the drought. Some well-informed people have declared through the public press that New South Wales would lose one-half of her sheep and one-fourth of her cattle during the season, even if relief came soon. Others, less pessimistic, though no better informed, estimate the loss at one-fourth. I asked the New South Wales stock inspector his opinion regarding the probable loss; he said the situation was "too deplorable to speculate upon," and he would only make estimates when sufficient facts were presented to justify them.

The wool year in Australia ends June 30. From the Secretary of the Wool Sellers' Association, I learn that for year ended June 30, 1895, there were shipped from the ports of Sydney and Newcastle, N. S. W., 755,769 bales; for the year ended June 30, 1896, 683,001 bales; and for the year ended June, 1897 (estimated), 687,000 bales, the average weight of bales being 350 pounds.

Owing to "tricks in the trade," these figures do not fully reveal the facts we would expect to find when the number of sheep sheared during each of these years is considered.

As before mentioned, there was a loss in the wool year of 1894-95 of 9,000,000 head of sheep in New South Wales, while the next year's fleece, from the reduced number, fell short of the former year but 72,768 bales. This was owing to the better season during 1895-96 and the consequent greatly increased weight of fleece. Well-informed wool dealers estimate a decline in the coming year's clip of at least 200,000 bales.

Recently, on one station in the interior, 45,000 well-bred sheep were killed that the pelts might be saved, and the following clipping from the Daily Telegraph of June 7 is but a sample of the reports from most of the centers of the continent:

"Upwards of 50 per cent. of the cattle and sheep in the Nhill district have died within the last few weeks through starvation, entailed by the prolonged drought. Chaff at Nhill is £6 12s. ($31.63) per ton. Generally, stock of all kinds in the district are in a deplorable condition. The water supply at Inglewood gave out last evening, and the town is now faced with a water famine. At Benalla, Charlton, and Pyramid Hill enormous mortality has occurred among the herds in consequence of the drought."

While it seems almost impracticable to feed flocks of sheep ranging from 50,000 to 300,000 head, many are striving to save their stock by feeding hay and chaff, lucerne (alfalfa) being purchased at £6 6s. (say $30) per ton.

I made a hasty tour of inspection some two weeks ago, covering some 1,500 miles of country. I have seen many well-informed squatters and I conclude, while the total losses will be enormous, and in certain districts equal to the highest estimates yet published, the evils are somewhat exaggerated. However, wool buyers need not be surprised to learn that fully one-fifth of the finest wool sheep on the globe have perished from this widespread and long-protracted drought, and that the fleece of the new clip will be very light, through a marked absence of yolk.

Even in Queensland, notwithstanding her enormous efforts and splendid success in artesian boring, the flocks have declined. While in Brisbane (600 miles north of Sydney), I learned from the Agricultural Department that, in 1894, Queensland had 19,587,691 sheep; in 1895, 19,856,959; in 1896, 19,350,000; and this year there would be a decrease of nearly 1,000,000 head. In 1894, Queensland had 7,012,997 cattle; in 1895, 6,828,000; and in 1896, 6,520,000, while this year the number will decrease at least 300,000 head. Queensland is twelve times as large as the State of Iowa, with one-fifth of Iowa's population.

The meat export of Australia will probably be reduced one third, while the grain imports are like to be nearly as large as in 1895-96. The general trade must suffer depression until the country has time to recuperate. Owing to her wonderful resources and the energy of her people, recuperation will be very rapid when the long dry spell is once broken.

From the awful destruction of the recent drought, there may arise a real good, as the question of conserving the waters that rush down the Darling and its tributaries is being earnestly urged by many influential people, and the "artesian bore" promises to become a great factor in the productive energy of the continent.

It is not so much more rain or even more water that is needed in the eastern colonies of Australia, but a more scientific method of conserving and utilizing the waters available in nearly every portion of the leading pastoral districts.

While this report has been waiting the steamer, there have been heavy rains along the coast (7 inches in a single day at Sydney) and large districts in the interior have been favored with refreshing showers. However, there is but little evidence of a general break in the drought

GEORGE W. BELL, Consul.

Sydney, June 1, 1897.

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## *AMERICAN FINANCES.*

The credit of the United States, as reflected in the price of Government bonds, never before stood so high. The country's possession of gold, in and out of the Treasury, was never greater. The addition to the supply from mines within our borders is expected, by experts, to be larger in 1898 than in any previous year. Moreover, the opening of the Alaska mining districts will certainly bring several millions of gold into this country within the next ten months. The United States Treasury has, at times in the past, held more gold than it does to-day. The amount of Treasury free gold, however, is much larger than in any year since 1890. It has been steadily increasing of late, until a prospect is now presented of the Government having to use the coin in its ordinary payments.

The amount of specie held by the associated banks of New York is also unusually large, and exceeds by more than twenty millions the amount of legal tenders held. The monetary position of the country is remarkably easy. The banks in the West are unusually strong in reserves, and some of the prominent institutions in Chicago have actually been able to place loans, estimated at well into the millions, in Berlin. These transactions are unprecedented. New York, for the first time in its history, loaned money last year in London, which has always been the financial center and clearing-house of the world. This state of affairs was brought about partly by the absorption by American capitalists of various United States securities, valued in the hundreds of millions, which foreign holders have almost steadily been selling since the Baring Bros.' failure in 1890. It is also largely due to the extraordinary favorable international trade balance, created by our economy in the use of foreign goods through the depression following the panic of 1893, and to the higher price of our food products which we have been able to command within the last two years.

Cotton was formerly the great debt-payer of the United States; that it is to say, the exports of this commodity were so large as to cancel an immense amount of the obligations we incurred in purchasing European manufactured goods. Wheat is fast elbowing cotton out of its former place. The international cereal situation has been remarkably to the advantage of this country. One of its most happy features has been the absence of any attempt of Chicago speculators to corner the wheat market. The holdings of actual wheat by the capitalists, headed by young Mr. Leiter, have not been taken off the market, but have been steadily supplied to exporters. Legitimate trade conditions have warranted improving prices, but the export movement has not been obstructed by reckless manipulation or preposterously high estimates of the market value on the part of American holders. The result has been that the Western agricultural and general business communities have reached a state of prosperity unknown in years, while the entire country has been strenghtened by the addition to the international merchandise credit on our side of the account.

There are other foundations for confidence. Not the least of these is the thorough liquidation which has taken place in the business and railroad world. By the reorganizations of the last few years, the railroads have brought their fixed obligations within amounts safely covered by the earnings of years of very ordinary traffic. This, coupled with the introduction of permanent economies in operation, enables the transportation lines to flourish on a low estimate of rates. The position of investors in railway securities—whether they are men of large wealth, or the numerous small holders scattered through the country, in small towns and even hamlets and villages—is more secure than at almost any previous time since the railroad industry came into existence. Railroad obligations have been scaled down to meet the exigencies of hard times, and therefore further business will be of decided advantage to the holders of stocks. There have also been drastic reorganizations of several industrial organizations. The panic of 1893 was followed by a thorough weeding out of weak banks and individuals engaged in business. As a consequence of this conservative line of action the liabilities in business failure in the last few months have been materially below the figures of several preceding years.

The financial interests of the country repose entire confidence in the determination of the Administration to protect the integrity of the currency. This has not led to a relaxation of the efforts to place our money system upon an impregnable basis. It is an encouraging sign that Congress is showing, for the first time in some years, a sincere disposition to economize in public expenditures. Improvement in the national revenue has fairly begun, and continued expansion in the industries will accelerate this tendency.—Com. New York.

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## *WHAT IS FERMENTATION?*

The following article from the India Tea Planters' Gazette will be read with interest by all planters, though the inference that the fermentation of tea is real fermentation, is by no means justified. The initial changes are far more likely to be due to oxidization, as demonstrated by Bamber, than to real fermentation:

1. What is real fermentation ?
2. Is it either possible or probable that real fermentation can take place in the manufacture of tea?

The researches of Pasteur led to the following conclusions regarding fermentation:

Fermentation is produced by the action of living germs or cells on the substance to be fermented. These cells or germs may be of three kinds:

1st. The living cells which exist inside fruits.

2nd. The germs or seeds of plants.

3rd. The germs of animalcula.

In the first instance what takes place is this: The cells take oxygen from the saccharine juices of the fruit, throwing off carbonic acid and producing alcohol. If these cells are broken or injured by the gushing or other means, they are powerless to effect this: everybody knows the unpleasant hot flavor of a pine-apple that has been kept too long. It has lost its sweetness and has acquired instead a peculiar burning taste. What has taken place is neither more nor less than fermentation. The living cells which exist in the pulp of the fruit have absorbed oxygen from the sweet saccharine juices, and have by doing so, produced alcohol, which is the cause of the burning taste.

The second instance arises from a very different cause. We now have the germs or seeds (as they really are) of a plant acting exactly in the manner we have described, in a foreign substance. This is the sort of fermentation that comes into play in the manufacture of beer and wine. The brewer first steeps his barley for a certain time in water, then drains and subjects it to a gentle temperature sufficient to cause it to germinate; he then dries it on a kiln, and calls it malt; he now grinds and mashes it up with warm water, boils it with hops until all the soluble parts have been extracted, and obtains an infusion which is called wort. He has now got to ferment this, and for the purpose uses the seed of a minute plant called Torula cerensiœ. Yeast is a fluid containing these seeds in suspension, and the admixture of the yeast with the wort is simply the sowing of the seeds of the Torula in a congenial soil. These seeds sprout and grow, but in order to do so they require oxygen. They accordingly take it from the sugar contained in the wort, turning it (the sugar) at the same time into alcohol, and acting just in the same way as the life-cells did in the case of the pine-apple. In the manufacture of wine, yeast is not required, simply because the seeds of the Torula are found on the outer surface of the ripe grape ready to hand.

Break the skin, and the seed is sown, and forty-eight hours afterwards we find it sprouting into growth with all the usual phenomena of real fermentation. The result of fermenting wort with Torula is the beverage called beer. The result of fermenting the must of the grape with the seed of the same plant is wine. Were germs of other ferments sown in the wort or must, fermentation would ensue, but the results would not be palatable. The maladies of beer are owing to its being contaminated by germs floating in the air which are not those of the Torula. The plants which spring from these objectionable seeds are not nourished in the same way as the Torula, and consequently the result is not beer.

The third instance is that in which the germs or eggs of animalcula are sown; in short, when animal and not vegetable life is the fermenting power. When milk turns sour or putrefies, the cause is to be sought in the presence in it of curious eel-shaped organisms; the sourness being due to an animalcula called Vibiro, and the putridity to a different one called Bacterium. These animalcula float in the air, and are the direct cause of milk going bad. Keep your milk in air free from them and it will never go sour or putrefy. Take an ordinary tin of soup, open it and leave it exposed to the air in a room; it will putrefy in a certain period, which will be longer or shorter according to the temperature of the atmosphere. Open a similar tin in air which has been freed from such germs, and it will remain perfectly pure. The bacterial eggs which float in the air of a room fall into and are hatched in the soup. They then breed and multiply at a marvellous rate, totally altering the composition of the soup; and the result is putrefaction, as it is commonly called, which is really due to fermentation.

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## *JAMES TAYLOR ABOUT HAWAIIAN SUGAR.*

James Taylor, of Pecos, N. M., a member of the American Society of Civil Engineers, chief engineer of one of the largest irrigation companies in the United States and proprietor of one of the largest beet sugar factories, takes issue with Mr. Oxnard of Grand Island, Nebraska, concerning the effect of Hawaiian annexation upon this industry. He speaks from personal observation and experience in the manufacture of beetroot sugar for several years in California and New Mexico, when he testifies that annexation will have no injurious effect.

"I know from personal knowledge," he says, "the climatic condition of the Hawaiian Islands and the general nature of their soil and products. There is approximately only 80,000 acres of cane land under cultivation, which under the most favorable circumstances produce, say, an average of a little over 200,000 tons of sugar annually. The present is practically the limit of area naturally available for the successful growth of sugar cane. The entire annual crop of sugar exported from the islands is only approximately 10 per cent. of the annual amount of sugar consumed in the United States, which amount is mainly imported from foreign countries, and has for the last few years averaged more than 2,000,000 tons of sugar per annum; consequently the price of Hawaiian sugar cannot effect the price of beet sugar of the United States, as the market price of such staples is fixed at the great commercial centers of the world—namely London and New York.

"The consumption of sugar in the United States is rapidly increasing with the settlement and development of our country, so that in the near future the Hawaiian sugar crop will be a still smaller percentage of the annual output of the world.

"Of the total amount of sugar consumed annually in the United States only approximately 16 per cent. was produced on American soil for the year 1897, making 84 per cent. the approximate amount of importations, coming principally from Europe and the East, West and British Indies. To produce the amount of sugar now imported from foreign countries (other than Hawaiian) would require at least 500 beet sugar factories having an average daily capacity of 500 tons of beets, each factory utilizing the product of 3,300 acres of sugar beets. The 500 factories would utilize the product of 1,650,000 acres of beets, based on an average of ten tons of sugar beets per acre, or 16,500,000 acres of beets, valued at $85,000,000, as the average price paid to the farmer for beets is $4 per ton. The production and handling of this quantity of beets would directly and indirectly give employment to more than 1,000,000 of people."—Grand Isle (Neb.) Independent.

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A young business man, bright, capable and ambitious, is not a bad channel through which to invest capital, and a partnership of money and brains is usually of mutual advantage.

## *GENERAL BEN BUTLER'S ADVICE TO YOUNG MEN.*

Nothing is so safe an investment as improved real estate. Nothing is likely to grow in value faster. In the last fifty years ninety per cent. of all the merchants and traders in Boston have failed. In the last fifty years ninety per cent. of all the business corporations have failed or gone out of business, so that their stock has been wiped out. In the last fifty years all the improved real estate on the average has paid its interest and taxes, and quadrupled in value. If a young man's father can give him anything to start him in the world, he had better invest it in that way, and let it accumulate and earn his living, and he will be richer than if he had gone into business. Jay Gould is said to have started from a mouse-trap seller to become a millionaire. Assuming that to be true he is only one in 60,000,000 of people; and if any young man thinks he is going to imitate Jay Gould, there is 60,000,000 chances to one that he won't succeed.

The rule I would lay down for a young man is, never to do a mean thing for money. Be prudent and saving of your money. Be careful to have no interest account against you, unless you have an equal or greater interest account running in your favor. Work diligently and you are sure of a competency in your old age, and as early as possible, if you can, find a saving and prudent girl, who has been brought up by a mother who knows how to take care of a house, and make a wife of her. She will aid and not hinder you.

I claim no originality in this advice, and will relate you an incident in my own experience to illustrate it: In my earliest practice in my profession I was quite successful in earning money, and I had a small balance in the Lowell bank, at the head of which was Mr. James G. Carney. The bank was directly across the hall from my office. I stepped into the bank to deposit a little money on one occasion, and Mr. Carney said to me: "Why don't you invest your money?" "Invest," said I; "I have nothing to invest." "Oh, yes," he says; "you have quite a little sum of money, and I see your young friends come with your checks occasionally, evidently borrowing it. Now you have better invest it." "How can I invest it?" "Invest it in real estate." "I know nothing about real estate."

"Go to the first auction and buy the property. You cannot be much cheated in that, because you will have to give very little more than somebody else will have to pay to get it. Give your notes for it, save your money, collect your fees, pay your notes as they become due. See that the property is improved properly, so that the rent will keep down your interest account, and when you get any other money invest it in the same way, and if your notes press upon you a little faster than you can pay them, why we will, when we find that is what you are doing with your money, discount your note and give you a little more time, so that you can pay it up. This will necessitate the prompt collection of your bills, for I know that you would rather work and earn a hundred dollars than dun a man for it. You have not even asked for a little bill that we owe you in the bank, which shows me that you do not promptly collect your dues."

I followed the advice and bought a number of pieces of property in that manner, and I never did exactly know how they were paid for, but they were, and in a few years I owned some twenty different pieces of property in Lowell that came to me in that way. I can only say that I wish I had been wise enough to have continued this course through life.

I do not think that I need to extend these suggestions any further, because a young man won't mind these, he won't any others, and I cannot suggest any better ones.

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## *CONCERNING TREATY RIGHTS.*

Recent precedents appear to show that treaty rights with a country that is acquired by another nation do not survive the new relationship. France has lately acquired both Tunis and Madagascar—the former by cession, the latter by conquest. With both of these countries England had valuable treaty rights. At first the British Foreign Office appeared to be disposed to maintain that the rights of British citizens in these countries were not affected by the change in sovereignty. But now that claim has been abandoned, and both these countries are practically closed to British trade, and a British citizen has only the rights in them that he would have in France, modified by local regulations. Our State Department also appears to have acquiesced in the decision that our treaty rights in Madagascar were abrogated when the island was conquered and made a French colony. The Japanese Government, under this precedent, made a good point when it claimed that the rights of the Japanese in Hawaii now secured by treaty would be abrogated if the islands were annexed to the United States. The same precedent would doubtless control in China if the Empire should be divided up among the European nations, whether by cession or conquest. The first treaty between the United States and China, made in 1844, provided that Americans trading in China "shall in no case be subject to other or higher duties than are or shall be required of the people of any other nation whatever, * * * and if additional advantages and privileges of whatever description be conceded hereafter by China to any other nation, the United States and the citizens thereof shall be entitled thereupon to a complete, equal and impartial participation in the same." The next treaty, in 1858, provided that should China at any time grant to any nation or its subjects or citizens "any right, privilege or favor which is not conferred by this treaty, such right, privilege and favor shall at once freely inure to the benefit of the United States, its officers, merchants, and citizens." These provisions are still in full force. They have been renewed in all our subsequent agreements with China. It is evident at a glance that these "most favored nation" clauses are the guarantee of our commercial relations with China, but it is equally evident that, under recent precedents, Chinese markets will be closed to the United States, in whatever Chinese territory France, Germany or Russia acquire. If they open such markets to us it will be because they have suddenly abandoned their present commercial policy. Of course the rights of our missionaries would share the same fate as the rights of our merchants.

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## *BELGIUM—A LAND OF INTENSIVE AGRICULTURE.*

A compact little country is Belgium, its greatest length 172 miles, width 99 miles, while its population shows a remarkable density of 550 per square mile; area 11,373 square miles, total population 6,262,000. It is about as large as Maryland, and one twenty-fourth the area of Texas, where there was a population in 1890 of little more than eight per square mile. Agriculture is very progressive and the various departments of farming are carried on in the most intensive manner, so that Belgium is perhaps the best cultivated country in the world. Live stock raising is more important in Belgium than in any other country of Europe; more heavy draft horses are raised here than are produced in the whole of France.

With its dense population, Belgium is naturally a large buyer of foreign countries of cereals and flour. In a recent year these amounted to $53,000,000. Next in importance are raw textile fibers, 34; imports of live stock, seven; animal fats, six millions. Belgian exports are largely manufactured goods and raw sugar. Considerable quantities of grain entering Belgian ports are subsequently reshipped to European countries. Large quantities of beef and hog products are exported from the United States to Belgium. Of bacon alone, we have shipped them over 20,000,000 pounds in a year, hams 11,000,000 pounds and lard 30,000,000 pounds, a part of all this hog product being subsequently re-exported to other European countries. Belgium is also an important buyer of oleo oil. Some prejudice exists against American meats and meat products. The Belgians are ready to use American flour if it is good, and the price advantageous. Up to a short time ago the use of Indian corn as an article for the table was entirely unknown. This suggests the possibilities of introducing corn and corn meal to the attention of densely populated Belgium. One year with another, we export fair quantities of rye to Belgium, yet her purchases of this are largely in eastern Europe. —American Agriculturist.

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## *SEEDLING CANE.*

The sustained humidity has made a revelation in cane fields, of the great fertility of the Bourbon cane. Seedlings, if our facts justify the inference, must be growing in tens of thousands on all the larger sugar estates of the colony. Taking only very small areas, that is relatively few rods, a couple of sharp-sighted lads, knowing what they are looking for, will pick up, already rooted in the moist soil, a few hundred, or even thousands of the tiny plantlets with their primal leaves barely a quarter of an inch long, in two or three hours' search. They brought in one day recently three hundred. So abundant are they that hand sowing of the Bourbon variety has been abandoned, as many times more than can be accommodated when grown on can be picked up in the field, all perfectly true to lineage, as there is no admixture of other kinds in the field.—Demerara Argosy.