THE HAWAIIAN

PLANTERS' MONTHLY

PUBLISHED FOR THE

HAWAIIAN SUGAR PLANTERS' ASSOCIATION.

VOL. XVII.] HONOLULU, SEPT. 15, 1898. [NO. 9

A change in the price of sugar in New York—4⅜ cents.

Sugar planters and agents will be interested in the communication of Prof. Shorey on the fermentation of sugars in this number. Coffee growers and others engaged in raising fruits of all kinds, should not fail to read the article on the manner in which bees carry on their work of fertilizing the flowers of fruit trees, showing how indispensable they are to successful horticulture.

Admiral Dewey, in commending the brave conduct of Chinese servants and other Chinese, on his ships in the battle of Manila, suggests that they be rewarded by being made citizens of the United States. Certainly we could not do less for them. Admiral Dewey makes his appeal irresistible when he adds that men who have battled for our country should not be excluded from it.

Massachusetts has passed the Torrens Land Transfer Act, to go into effect in October. It is to be presumed that it is a much fuller, safer and more complete law than that adopted by Illinois four or five years ago, which did not work well. The Massachusetts law will amount to a system of State insurance of land titles. Under the law the title must be proved to the satisfaction of a duly constituted court, and it will then be registered, and there will thereafter be no occasion for proving it. The decision of the court is final, except in cases of alleged fraud in procuring the registration itself.

The U. S. government war loan was subscribed six times over. For the issue of $200,000,000 more than 300,000 subscriptions were received for an amount exceeding $1,325,000,000. Europe now knows as never before, the tremendous financial resources of the United States. All this money seeking investment at a very low rate of interest proves that under settled conditions, there is capital and to spare for its development of all legitimate business enterprises. Capital ought not to be too timid—it ought to do its best to make business better.

We are entering upon a new era. The flag will not be lowered from Hawaii, and the fate of the Philippines is linked with the destiny of the republic. This nation in the near future is to become the leading factor in international politics. We cannot retreat to our former policy of isolation. In the domain of the Pacific, ours is henceforth the paramount power, and we cannot escape the responsibility. The future of an unborn empire of the West, the farthest West, that borders on the East again, lies in our hands. I believe we shall be equal to this responsibility.—Cushman K. Davis.

The Directors of the Pullman Palace Car Company, at their late regular meeting, declared the usual cash quarterly dividend of $2 per share, and also a special dividend of $20 a share. Hereafter, the regular dividend will be at the rate of 6% per annum. The Directors recommend that the surplus assets of the company, amounting to $18,000,000, should be distributed to the stockholders, and that for such purpose the capital stock should be increased to the sum of $54,000,000. The present capitalization is $36,000,000. The stock of the company sold before the above announcement at $211 a share, a rise during the week past of 18¼ points.

Most of our readers will be aware that we are almost within measurable distance of what once considered as the wild dream of Imperial penny postage. It has been decided that letter postage of one penny per half ounce shall be established between the United Kingdom, Canada, Newfoundland, Cape Colony, Natal and such of the Crown Colonies as may be willing to adopt it. Australia and India are at present undecided, but it is really now only a question of time. However apparently small, this is really a matter of immense consequence for the closer union between this kingdom and her wonderful system of colonies.—London Sugar Cane.

A very dangerous pest has attacked the banana plant in Australia, and a shipment of eleven thousand bunches is reported to have been condemned on arrival at Sydney, and were ordered to be destroyed. The insect is stated to be a fly that attacks the fruit, and destroys its value as food. A report states that this pest has appeared also in Fiji. If so, it is likely to be imported in any of this fruit brought from that group by the colonial line of steamers which touch here, and which are usually supplied with bananas grown south of the equator. While there may be no immediate danger of this pest being introduced in this way, it is well to be on our guard against it.

A United States commercial agent writes that the Russian Minister of War has ordered aluminum horseshoes for the cavalry. The first trial is now being made by the Finland dragoons, and the horses are shod as follows: A shoe of the new aluminum model is placed on one foot, the three remaining shoes being of the kind now in use. The trial, which has already lasted six weeks, seems to be satisfactory, as the aluminum wears out less rapidly and is less affected by mud and moisture than the ordinary shoe. The difference in weight is about 2½ ounces on each shoe. The cost is not greater at present, and will be less as soon as the system of manufacturing the new shoes shall have been perfected.

THE RAREST STAMP IN THE WORLD.—Stamp-collectors have paid high prices of late years for many rare issues, but the highest known, namely £1,000, has just been paid by Mr. W. H. Peckitt, the well-known stamp expert of the Strand, for a penny Post-office Mauritius, believed to be the rarest stamp in the world. This stamp was issued in 1847. Its extreme rarity is due to the fact that the number printed was exceedingly small, and the whole issue was used up in sending invitations to an official ball held in the island. The only other copy known —on the original envelope—is in the British Museum; and the only other stamp that has ever approached it in value is the famous yellow Brattleboro, which fetched £700.—London Papers.

It may not be generally known that age adds to the value of coffee. Coffee that has been kept in a dry and airy place for three, four or five years will fetch a much higher price than fresh gathered coffee. One of the most prominent dealers in New York makes a practice of storing his best grades for two years before roasting. It is well known that age improves the raw bean up to a period of five years. It tends to give the bean a mellow flavor, highly appreciated by lovers of the beverages, to store and carry Java or fine Maracaibo coffee five years adds ten cents per pound to its value. It is for this reason that some firms are retailing their finest coffee at several cents above the usual price. Whenever a customer finds a certain store always supplies coffee that tickles the palate, he cannot be won away by the attraction of a lower price and a poorer article.

This is what Henry Clews says in his New York weekly letter, and he but voices the feeling in business circles: "Ultimately the war will prove a powerful stimulus to the whole country. It has buried old political issues which were paralyzing trade and industry, and developed in our people a spirit of confidence and aggressiveness which will inevitably be reflected in the business affairs of the nation. The political situation is more satisfactory than for many years past. New questions are before us, the solution of which will broaden and strengthen the whole country from the Atlantic to the Pacific. In the financial situation there is also reason for confidence. Money is plentiful and promises to continue so. Gold must come from Europe in settlement of the extraordinary trade balance, and our supplies are likely to be materially increased by shipments from the Klondike.

The orange trade in Southern California is reported not to have been so profitable this season as in former years. Over six thousand car loads were despatched from various sections of the state to eastern markets. Some arrived in first-class condition and brought fair prices. It is stated that a large part of the crop has not realized good prices, so that the average has been a loss to the owners. The Rural Californian says that between the two extremes of $27 per ton received by the growers and $140 per ton paid by the consumers, lies the gulf in which so many hopes of the growers of citrus fruits have been wrecked, and through which they, with all their shrewdness, are unable to work without submitting to the tolls and exactions of those who occupy the middle ground, and hold the position in spite of the united efforts of the growers. The journal quoted from suggests that orange growers devote their energies to raising potatoes for the home market.

Frequent reference is made in our exchanges to the "Florida Velvet Bean" as a fertilizing crop, or as food for animals. Analysis shows that it contains 54 per cent. of nitrogen and 20 per cent. of crude protein. When planted in drill rows four feet apart, it will produce a solid mass of vine and foliage three feet deep. It commences to fruit at the hill in clusters like the raisin grape, thence along the entire length of the vines at intervals of 10in. to 20in. pods in clusters of from two to twenty appear. Therefore the fruitage must be immense. For twenty years this bean has had a home in Florida, and has been known among the people as "the climber." In good rich soil it will climb 50ft. to 60ft., blooming and fruiting all the way up,—a most beautiful and lovely sight to look upon. To plant an acre takes sixteen quarts of seed; to plant an acre in rows 4ft. apart each way about twelve quarts. In good soil this acre will produce four to five tons of green forage, and fifteen to seventeen hundred pounds of beans. As a fertilizer, it is one of the best known.

AUTOMATIC CENTRIFUGAL.—In France, an automatic centrifugal is attracting the attention. If it can accomplish only part of what is claimed it will certainly be a great labor-saving device. Under ordinary methods of working, it is customary to measure or weigh the diluted masse cuite, then to empty it into the centrifugal drum, followed by the starting of the apparatus, the washing with steam with the view of obtaining white sugars, the subsequent separation of the light from the dark washouts and the stopping and emptying of the centrifugal. This is all accomplished automatically in an apparatus three feet in diameter. The properly-prepared masse cuite is allowed to enter the measurer and follows without any assistance, all the various operations just enumerated. The white sugar, after leaving the drum, falls on an endless screw and is carried to the packing or storeroom. The appliance in question is to be built on a much larger scale and will have, consequently, a greater efficiency with no increase of cost for labor.—Exc.

Arbuckle's Small Sugar Packages.—Messrs. Arbuckle Brothers control a patented machine which packs sugar in small paper bags. They have had this machine in use at their coffee factory for some years packing granulated sugar in two pound bags. When their new sugar refinery begins working they expect to pack granulated in two pound and five pound paper bags, put up as follows: Two pound packages, packed 48 in a case, 250 cases to a carload—say 24,000 pounds net. Five pound packages, packed 24 in a case, 200 cases to a carload—say 24,000 pounds net. When a mixed carload of cases and barrels, and 200 or 100 pound bags is required, it will be made up at a minimum of 25,000 pounds net. It remains to be seen whether there will be any considerable demand for the small paper packages. Possibly at the start, a good business may be done in them because of their novelty to the trade generally.—Willett & Gray.

Sugar Output.—The American Sugar Refining Company at present controls 30 per cent. of the country's output. The present opposition includes the McGahan refinery at Philadelphia, with a capacity of 2000 barrels daily; the Mollenhauer with 3000, the National with 2000, and the Nash-Spaulding of Boston with 1500; but these three work in harmony with the sugar company; Henderson of New Orleans with 1200, Cunningham of Texas with 806, and 300-barrel refinery at New Orleans. In addition to this outside capacity, Arbuckle and Doescher will be ready some time this year, each with a capacity of 9000 barrels, and the plant at Crockett, Cal., with 2000 barrels, is about ready. If the three refineries which work in harmony with the American company are included in the opposition, at some time this year there will be sugar refining capacity of 19,000 barrels a day outside of the trust with its capacity of 40,000 barrels a day. Nothing like a combination of these outside refineries is expected, but there is a chance for an agreement on territory and sales.—Am. Grocer.

The Algeroba trees, which are so numerous on these islands, are now shedding their annual crop of seeds, which serve as rich and fattening food for horses, cattle and swine. In fact there is no better feed obtainable, though it lasts only for a few months, from July to December of each year. There are two kinds of these trees—the thorny and the thornless, the latter being not quite so robust, its limbs being more liable to be broken off by strong winds. With a little care in selecting the seeds, a grove of the latter may readily be secured. Had the first seeds of this tree, brought here in 1840, been of the thornless kind, our groves would now consist mostly of these, and be more attractive as pleasure resorts than they now are. The two varieties look very much alike, but an expert can readily distinguish them at a distance. Any persons wishing to plant the thornless variety will be supplied gratuitously with a few seeds, on application to the editor, either through the post-office or personally, as we have a quantity on hand for distribution. It may not be generally known that the flowers of this tree furnish food for bees, and when in bloom, myriads of bees of all kinds may be seen gathering honey all the day, and this is what has given such an impetus to the honey business on this island in which quite a number of foreigners are engaged.

One of the most important duties of those in charge of our school system is to instill into the daily life of the children under their charge habits of observation. How much is lost in life by a failure to appreciate natural beauty; a failure to get that keen enjoyment that comes from seeing clearly and truly the things that an artist would like to paint. The ability to see in this way is not wholly born with one. The blindness, if so it may be called, is due as much to lack of suitable training and proper surroundings as heredity. This is shown by the fact that many learn after reaching maturity to see new beauties in things with which they have been surrounded all their lives, but had never truly seen. If people could see and appreciate the beautiful things about them the world would grow better looking because they would seek to have these things about their homes, where they could watch their development from day to day. Let our children form a closer acquaintance with the flowers and shrubs, with the trees and birds, so that they can realize and enjoy the beauty around them. They will be happier and better, it will lead to keener observation in other lines, and the interest thus aroused will be a more powerful incentive to study than could be formed in any other way. An inexpensive microscope will disclose in the most ordinary and common things about us beauties hitherto unseen. Children are communicative, at least among themselves, and the class will profit by the discoveries of each individual. The healthy rivalry will lend zest to the search for new items of interest, and study will become a pleasure instead of the "horrid grind" that so many have found it in their younger days.—Rural Californian.

Male Coffee Trees.—It is a common idea amongst planters that in every nursery one is sure to find a certain proportion of so-called male trees. These are distinguished by their long and narrow leaves. It is held that such plants never bear, and should consequently be destroyed in the nursery. Botanists who have heard of this idea are very curious to obtain blossoms from this tree for examination. But somehow or other, fairly common as this "male coffee" is said to be, specimens have never been obtainable. We should be much obliged if one of our readers would kindly forward us a flowering branch, as we wish to submit it to a botanical expert for examination and report. We are assured by a planter that, though the name may be botanically inaccurate, there is certainly a very distinct species of coffee. The non-bearing idea is, of course, absurd, but the crop is irregular at best. There are two other points of special interest about it. One is that an extraordinarily large proportion of the crop from such trees is pea-berry. The other is its almost complete immunity from leaf-disease. The growth of the primaries is upward, approaching that of the "chick," while the leaves are long, narrow, very thick, and of an unusually dark glossy color.—Madras Planting Opinion.

The cordial support given to President McKinley since his advent to office is of the most gratifying character. The confidence of the country is his, irrespective of party feeling, and to a remarkable degree. We fail to recall an administration that has been so free from criticism as that of President McKinley's. The leaders of the opposing political party have been unusually generous in their support, while from the rank and file of both parties there is nothing heard but praise and commendation for his untiring devotion to the exacting duties of his great office; for his kindly yet firm spirit in the prosecution of the war; his earnest desire for a speedy peace; his quick decision in matters affecting the operations of the Army and Navy; constant efforts to mitigate the horrors of war; politic course with factional leaders; unflinching devotion to the flag. The physical strain that the President has undergone for a number of years has been of the most severe and sustained character; but thanks to his temperate and pure life, and kindly disposition, he has thus far stood the phenomenal tax on his strength without losing a day from his office. May peace bring to him the opportunity for a long vacation, to be thrice enjoyable by reason of his having with him the love, respect and confidence of all the American people and the hearty admiration of our friends across the ocean!—Am. Grocer.

:o:

NEXT ANNUAL MEETING.

Sugar planters and others interested in agricultural pursuits will bear in mind that the annual meeting of the Hawaiian Agricultural Association will be held in this city in November next. Besides the reports of the regular standing committees, communications on any branch of agriculture, machinery and other local industries suited for Hawaii, or relating to lands, forestry, etc., will always be welcome, whether prepared by members or others interested in Hawaiian progress. The transactions of this society are now eagerly looked for by sugar planters in every part of the world, and it is acknowledged that this industry in Hawaii is forging ahead, and taking rank among the most successful sugar countries, and keeping fully abreast of the beet industry of Europe, in the quantity and quality of sugar produced per acre. No date has yet been announced for the annual meeting, but it will probably be held during the latter part of November.

The following are the Committees of the HAWAIIAN SUGAR PLANTERS' ASSOCIATION, who are expected to report at the annual meeting, to be held in November next:

CULTIVATION.—Geo. Ross, Geo. F. Renton, Geo. R. Ewart, W. J. Lowrie.

FERTILIZERS.—J. A. Scott, C. M. Walton, Anton Cropp, Prof. Maxwell.

MANUFACTURE.—H. Morrison, H. P. Baldwin, C. C. Kennedy, H. Deacon.

MACHINERY.—A. Moore, J. Watt, Geo. C. Hewitt, D. Center.

DISEASES OF CANE.—Prof. Maxwell, Prof. Koebele, J. Marsden, C. Wolters, John Hind.

EXPERIMENT STATION.—Prof. Maxwell, C. B. Wells, F. M. Swanzy, H. P. Baldwin.

FORESTRY.—W. M. Giffard, J. M. Horner, J. Marsden, Prof. Maxwell.

LABOR.—W. W. Goodale, Jno. F. Hackfeld, F. A. Schaefer,

———:o:———

HAWAII AS AN AMERICAN TERRITORY.

The American Commissioners, appointed by President McKinley to visit Hawaii and assist in framing an organic law for the government of this territory, arrived here August 17 on the mail steamer Mariposa. On the following day they met with the two Hawaiian Commissioners, also appointed by the President, and organized as a joint commission with the following five members: Representative Hitt, who was chosen chairman, and Senators Morgan and Cullom, representing the American government, and President Dole and Justice Frear, representing Hawaii. These gentlemen are well known, both in America and here, and a selection of five more competent men for the service could not have been made, so far as qualification for this service is concerned. Each member is deeply interested in the work, and anxious to see the union of Hawaii with America based on a fundamental law that will prove advantageous to both parties, and cause as little friction as possible, where problems are presented to be solved, which must necessarily be experimental.

Hawaii is not to be compared with Alaska, Arizona or New Mexico, at the time that these foreign territories were annexed to the Union. She has maintained a self-sustaining, independent government for the past fifty years, recognized as such by all the leading powers; and were it not for the jealousy, greed and rivalry of more powerful nations, as exhibited in these days of territorial land-grabbing, in every quarter of the globe, she might have continued to exist as such for fifty years to come. Her government seeks to encourage every branch of industry, so far as lies in her power—to maintain impartial courts of justice, and free public schools, such as exist in very few countries. And these and other branches of public service are based on the best and latest systems established abroad. The existence of these institutions affords the best evidence of a well-organized and successful government, and they emphasize the claim of Hawaii that its leading features should not be materially changed, where they conform to the principles of republican government.

The question of voting will come up for discussion. It is perfectly clear that every male now residing in Hawaii and of legal age should not be allowed to vote. The population is made up of many nationalities, and to grant to all the privilege without restriction, simply because they reside here to-day, will not be approved. Under the peculiar circumstances in which Hawaii is placed, there will have to be a line drawn. To grant the privilege to illiterates or transient residents is destructive of the first principles of republican government. Some qualification, applicable to the peculiar situation in Hawaii, would seem to be a necessary safeguard of life and property.

———:o:———

AUSTRALIAN CONFEDERATION.

Our southern neighbors of Australia have not succeeded so well in their project of confederation, as many had hoped; and they must concede that Hawaii has distanced them in the race seeking strength by union with neighboring states. Although three of the provinces voted in favor of it, the defeat came from a source least expected, and New South Wales failed to endorse it, though she was the prime mover and leader in the project. There can be no doubt that a majority of the influential people of that country favor federation, and that it will eventually be adopted by all the provinces, including Queensland, which had all along been the most stubborn opponent of federation, fearing perhaps that it would be a death-blow to her rising cane-sugar interest. However, the project will not be endorsed before the new century dawns, and as the people are rapidly becoming better educated in the advantages of union, it will not be many years before Australia will be like Canada, a confederate dependency of Great Britain, enjoying all the benefits of a republic, with the protection of the British Government. Such a colonial empire—all but in name, will add a strength to the British Crown in the Pacific which does not now possess, however, loyal it may be. It may take five or six years to accomplish this, but that is not long. It took little Rhode Island six years to make up her mind to join the great American Republic, but once in, she wondered why she remained out so long.

A colonial writer, quoted in an exchange, has the following sensible remarks on this federation project, and his views are quite just: "What is federation, but the application of the law of brotherhood to politics? We are men and women in these colonies, of one race and blood and speech and type of civilization. We are held together by what may be called household bonds. We inherit a common history. We possess a single continent. A great and beneficent feature is possible for us; we may make a magnificent contribution to the common life of the race. But we are divided, and our divisions make us helpless. They imperil our future. They give all the forces that make for strife, for envy, and for mischief, an evil opportunity. The colonies are moving on diverging lines; the intervals betwixt them widen; the forces that make for division multiply; the jealousies which part them grow fiercer. Federation makes not only for brotherhood, but for that peace which is the happy consequence of brotherhood; federation will certainly ennoble the ideals of the national life. It will give a larger career to our politicians, a wider curve to our public interest. And all these are forces which make for righteousness, and will check that tendency to a narrow and jealous provincialism which threatens to dwarf the public life of Australia. It would be a supreme disaster to humanity if Great Britain underwent some sudden and fatal loss of strength. Now, these colonies are living members of the great political system we call the British Empire. Our weakness makes that empire weaker, and weaker for all the causes the Empire serves. Any increase of strength in us makes stronger all the wholesome forces which the Empire contributes to the life of the race. Federation will enormously add to the strength of these colonies, and so give the Empire of which they are provinces not merely new dignity and added resources, but a new energy for playing that providential part in the great drama of the world's history to which it is called."

TO INTENDING IMMIGRANTS TO HAWAII.

Commission of Public Lands,
Honolulu, H. I., Aug. 26, 1898.

The natural interest taken in Hawaiian matters by the people of the Great Republic, and the tendency which exists with many to look for great and golden opportunities in the distance, is apt to tempt to these Islands a considerable number of people who are ill informed, or not at all informed, of true conditions here, and many of whom must be disappointed.

It is with the desire to clearly set forth the conditions, at least as far as regards the public lands of the Islands, that I make these statements, in the hope that they may come to the attention of some of these intending to try their fortunes in Hawaii.

First, it should be noted that Hawaii is not a "new" country with great unbroken areas of public lands awaiting the settler. For half a century a definite system of land division and ownership has existed, and for that long period transactions in public and private lands have steadily taken place as in all civilized countries. The policy of selling lands outright for cash at low figures, and of making long leases of large tracts, was steadily carried out from the early "fifties" until the date of the Land Act of 1895, and the result is easily inferred. A large portion of what might be called the "cream" of the Government lands had at the latter date passed into the hands of private owners, and long leases have been made covering the most valuable Government and Crown lands, many of which leases are still in force. It was to conserve and devote to the use of "bona fide" settlers the remaining public land, that the Land Act of 1895 was passed, which Act, eminently suited to the conditions of the case, is in force at this date.

To carry out the purpose of this Act, public lands have as fast as practicable been divided and opened up. As there has been for the past two years a keen demand for such lands, both on the part of old residents of the country and of new comers, it has followed that all tracts have been taken up as soon as opened, and at the present date there is practically no land ready for the occupation of any considerable number of new comers. The survey work which over rough mountain lands and through dense tropical jungle, is at all times a laborious and slow process, was interrupted at the end of 1897 by the exhaustion of appropriations for that purpose, and has only been recently resumed upon the passage of new appropriations. It is inevitable that some time must elapse before necessary surveys can be completed. The new lands are off the lines of travel; much difficulty is encountered in projecting roads to reach them and the task all around is a difficult one which one unfamiliar with the country cannot easily estimate.

The lands laid out and disposed of since the date of the 1895 Land Act have been those portions most favorably situated, and those remaining are of course still further removed from centers of population and lines of travel. To settle upon and to improve such lands is no "soft snap."

To residents of the Islands it is well known, but for the information of others it is necessary to state that as far as cane lands and sugar cultivation is concerned, there is practically no opening except for large capitalists, and for few, if any, of those.

The field is occupied by those who for forty years have been developing this industry, extending and consolidating their interests.

The low lying flat land of the country with abundant water supply, a considerable part of the whole, is wholly occupied by rice or taro planters, who have engaged in those planting occupations for many years.

There remains still a considerable area disposed of, as surveys are completed, and as old leases expire, principally of lands suited to coffee cultivation and small farming.

With reference to lands suited to coffee cultivation it may be said, that the same are in general forest and bush lands, requiring much labor and expense in clearing. Being in general, away from present main lines of travel, they are at a disadvantage as regards roads, and it is inevitable that for some time, trails more or less rough, must take the place of wagon roads. For the development of a coffee plantation, even of moderate size, capital is needed. Good intentions and industry alone will not suffice.

As far as I am able to learn the expense of purchasing, clearing, planting and caring for a coffee plantation during the five years necessary to produce paying crops is not less than from $150 to $200 per acre, and with this must go all the careful management without which expenditure is of little avail.

Drawbacks of various kinds are common to all agricultural enterprises, and fluctuation in prices prevails, in the coffee market as well as in others.

As to small farming it may be said, that while an admirable climate and fertile soil would probably ensue to an industrious person all that would be needed for his own sustenance, the question of additional profit is a difficult one to answer. The local market is easily supplied and is in fact reasonably well supplied at the present time. What future demands will be, or what new crops may be profitably grown, it would be dangerous to predict.

Experience, economy, and hard work will have much the same value that attaches to those qualities elsewhere. In other words, this is no agricultural "Klondike" where nuggets lie about loose. The condition here is much the same at the present time as in other prosperous civilized countries.

With every desire to encourage and assist any one seeking to find or better his fortune in Hawaii, I would still say:

Don't come as a sort of forlorn hope, without experience, without money, trusting to good luck. Good luck is as shy here as across the water.

Don't come to plant coffee without necessary capital.

Don't expect to find a country where hard work, care and economy are not necessary.

Don't come without getting all reliable information that you can in advance.

Don't come within the next six months, for surveys must be made of lands to be opened.

Don't come to speculate in lands, for the present Land Act was intended to prevent that, and accomplishes its purpose fairly well.

But if you wish to come after fully considering the matter, and can bring experience and energy, with enough capital to insure you against any danger of want, and enable you to study the situation on the ground, before making a final decision, it is safe to say that you will be welcome, and what has been a kindly country to others, may prove so to you.

J. F. Brown,
Agent of Public Lands.

Honolulu, Aug. 26th, 1898.

THE DETERIORATION OF RAW CANE SUGAR IN TRANSIT OR STORAGE.

(From the Journal of the Society of Chemical Industry.)

BY EDMUND C. SHOREY, D.S.C.

Raw cane sugar is generally sold at a price based on its polariscope test, or, as it is more generally stated, on its polarization . The polarization represents, approximately, the amount of sucrose, or pure cane sugar in the raw sugar.

These raw sugars frequently in the course of transit, or when stored for some time, give a lower polariscope test than when they were made, which of course means that there has been a loss of sucrose. This deterioration of raw cane sugar is known wherever such sugar is made, and often results in large loss to the planter who sells, as well as the refiner who buys.

In the case of Hawaiian sugars the loss by deterioration has been brought more prominently to the notice of the planters by the shipment for the past two years of a portion of this sugar to New York via the Horn, which is a three months' voyage, instead of to San Francisco, which is a voyage of about three weeks. Some lots of sugar shipped from Honolulu to New York are stated to have lost as much as 8 per cent., and to have been in such a condition when taken from the ship's hold, that they "fell all to pieces" unless worked up immediately, entailing considerable loss to the refiners. Quite naturally the reason for this deterioration has been the cause of much thought and speculation on the part of those interested.

It has been stated, and has been generally accepted, that the primary cause is some form of fermentation, by which the sugar is inverted or destroyed. The reasons put forward why this fermentation should take place in some sugars and not in others, have been numeroas; and have embraced the whole matter of cane-growing and sugar-making from the condition of the soil to the drying of the sugar in centrifugals.

The reason most prominently put forward has been that sugars which have deteriorated have done so either because they were not well dried, or not sufficiently alkaline, and coupled with this the statement that the deterioration has been brought about by bacteria; prominent among which are those producing lactic and butyric acid. The inference of course is that these bacteria would not produce fermentation in an alkaline medium, or in one with little moisture.

In discussing this matter in the local sugar journal (Planters' Monthly) I have pointed out that the bacteria of the lactic and butyric ferments are found in all raw sugars, and that if the deterioration is caused by these bacteria, it may be accepted as an axiom that if one sugar deteriorates and another does not, it is because one presents the proper conditions for growth of these bacteria, and the other does not. I have also pointed out that if the butyric ferment is active in this deterioration the fact that the common butyric ferment is anaerobic must be borne in mind in attempting to solve this problem.

Within the past year I have had the opportunity of studying some lots of sugar which had deteriorated in storage, and as the result of this study I have solved the problem so far as the particular sugars are concerned. How far the explanation will apply to all raw cane sugars is a question which the future only can answer.

The history of the sugars in question—three lots—is briefly as follows:

Lot No. 1.

Hawaiian sugar made July 6th, 1897, polarization 98.1°, contained CaO 0.032 per cent., reducing sugar 0.21 per cent. alkalinity equivalent to 0.022 per cent. CaO.

This sugar was shipped to San Francisco July 12th, and arrived there August 11th, 1897, polarising 97.7°. A portion of this lot—five tons—was not shipped, but kept in the mill where it was made, stored in bags of 125 lbs. each. A sample was taken from this sugar in storage September 4th, which polarised 96.5°, a decline of 1.6°, and a sample taken December 28th polarised 94.0°, a decline of 4.1°.

This sugar at this time was still alkaline, possessing an alkalinity equivalent to 0.0168 per cent. CaO, and contained 4.1 per cent., reducing sugar.

At this time, this sugar, especially in the portion next the bag, was quite moist, but the gain in weight from moisture was not enough to show on the ordinary sugar house scales; less than half a pound per bag. This sugar was originally much drier than the average raw sugar, being dried twice the usual time in centrifugals running 1,500 revolutions per minute, and contained only 0.30 per cent moisture.

Lot No. 2.

Hawaiian sugar made in July, 1897, polarised 98.5°, made from neutral juice, sugar neutral. This sugar was shipped to San Francisco soon after it was made, and polarised there 98.5°. A portion was stored in the mill, and a sample taken January 26th, 1898, was slightly acid, and polarised 96.5°, a decline of 2.0°.

Lot No. 3.

Washed sugar, made from No. 1 Hawaiian polarising 98.8° by washing in the centrifugals with water, and drying in the sun, made for local consumption. This sugar was made in July, 1897, polarised 99.5°, and was slightly alkaline. A portion of this lot was stored in the mill in kegs holding 100 lbs. each. In January, 1898, one keg was opened, the portion next the keg, especially at the bottom, was found to be quite damp, and a sample from this portion was acid in reaction, polarised 85.5°, and contained 7.3 per cent. reducing sugar. The sugar in the centre of the keg was apparently unchanged, polarising 99.5°, and containing 0.14 per cent. moisture.

In each of these cases the sugars were stored in rooms which were neither very dry nor very damp. There was in no case any damage from accidental access of water; the floors were quite dry and the moisture taken up by the sugar must have been obtained from the moisture in the air.

It will be noted that the history of lot No. 1 is fuller than that of the others, and it is with this sugar that I wish especially to deal in this paper.

It will be noticed in the first place that the loss was due almost wholly to inversion: the sugar after having lost 4.0° was still alkaline, and the acid produced was only sufficient to reduce the alkalinity from 0.022 per cent. to 0.0168 per cent. In correlation to this stands the fact, that the refiners in San Francisco and New York, when complaining of deterioration, have always spoken of inversion. It is plain, then, that, whatever the cause of deterioration, and whatever the final products, inversion of the cane sugar is the first step.

The alkalinity of the sugar when made was quite high, as was also that of the juice from which it was made, in fact, much higher than is usual in Hawaiian sugar houses. I obtained for comparison two samples of No. 1 sugar from Ewa

Plantation, which sugar has the reputation of being less apt to deteriorate than any Hawaiian sugar. These two samples showed an alkalinity respectively of 0.0136 per cent. and 0.014 per cent. CaO, much lower than that of sugar lot No. 1, in fact, lower than this sugar was when it has lost 4.0°.

In view of the well-known fact that the lactic and butyric ferments require slight alkalinity for vigorous growth, it seems rather astonishing that anyone should put forward the theory, that lack of alkalinity, or lack of lime, is the cause of deterioration; coupled with the statement that the lactic and butyric ferments produce deterioration.

Inasmuch as highly alkaline cane juice gives a sugar objectionably high in ash, and also results in difficult working of low grades, and an increased loss in manufacture, it is easily seen that this is an important question. If making an alkaline sugar does not insure against deterioration, the practice is not to be recommended.

Many of the mistakes which have been made in treating this subject have arisen from taking the results of experiments with ferments in sugar solutions, and applying them to sugar in the dry state. Keeping this well in mind. I made a preliminary examination of sugar lot No. 1 in the following manner:—

A solution was made containing 10 grams of the fermented sugar in 100 c.c. solution. Portions of 100 c.c. were treated as follows: The series being duplicated, and the flasks in every case protected from access of dust from the air—

(1) 100 c.c. solution at ordinary temperature 75° F. for 24 hrs. had become neutral, and contained invert sugar 5.2 per cent., a gain of 1.1 per cent.

(2) 100 c.c. boiled one minute, plugged with cotton wool, at end of 24 hours was still alkaline, and contained invert sugar 4 per cent.

(3) 100 c.c. boiled five minutes as above with same result.

(4) 100 c.c. kept for 24 hours at 103° F. was then acid, and contained invert sugar 7.1 per cent., a gain of 3.0 per cent. The acidity was such that 100 c.c. required 2 c.c. tenth normal alkali to bring about neutrality.

(5) 100 c.c. solution, to which had been added 0.5 grm. CaO, kept at the temperature of laboratory 24 hours contained; then invert sugar 4.5 per cent., a gain of 0.5 per cent.

(6) 100 c.c. solution, to which had been added 0.1 grm. CaO,

kept at 75° F. for 24 hours contained; then invert sugar 4.7 per cent., and became acid in four days.

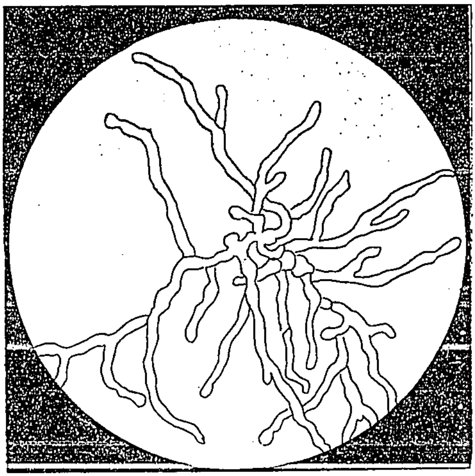
From this series it may be inferred, I think, that there was present in the sugar in question some ferment, which in solution at the ordinary temperature produced some acid and inverted some of the sugar; that a temperature of 103° F. this action was more rapid; that boiling for one minute rendered this ferment inactive, and that in quite strongly alkaline solution, the invertive action still went on.

It is generally accepted that the butyric ferments are without the power of inverting cane sugar, while the lactic ferments sometimes seem to have this power. It seemed to me, however, very unlikely that the inversion could be brought about by bacteria. The sugar was quite dry, the crystal separate and distinct, and in appearance was like so much air-dried sand. Even in December, when the deterioration had reached 4.0°, although the sugar was moist, each crystal was still separate and distinct, being simply coated with a thin syrupy film. Bacteria can only reach development in a liquid or semi-liquid continuous medium, and sugar, so long as it continued so dry that the crystals remained distinct and separated by air spaces, would necessarily prove a medium ill-adapted for the growth of such bacteria as produce lactic or butyric acid. Moreover, all the sugars examined showed as the result of deterioration a very small amount of acid, and a comparatively large amount of invert sugar. Now, if lactic acid ferments were the invertive agents, the processes of inversion and production of acid would, undoubtedly, go on together, or so closely that they would seem simultaneous. I was led to conclude, then, that the inversion was not produced by lactic or butyric ferments, but by some other agent.

The same of lot No. 1, taken in September, polarising 96.5°, was placed in a tightly stoppered bottle, and when the final examination of the sugar was made in December, was opened and found to be unchanged.

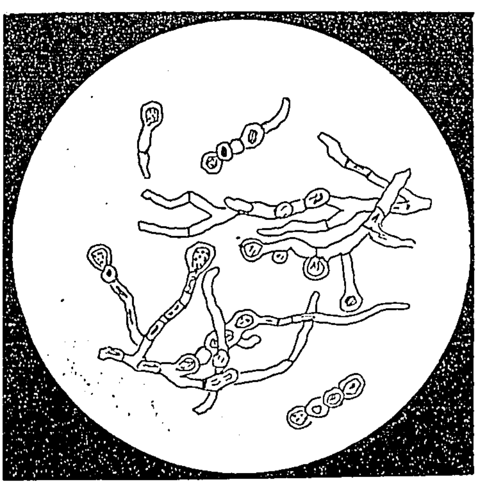
A 10 per cent. solution of this sample was made, and examined under the microscope, when a pronounced development of a fungus growth was at once discovered, each growth presenting an appearance of which Fig. I. is a sample. As much of the solution as could be placed under a cover glass 18 mm. diam. contained three or four such growths. Several of these were separated and transferred to sterilized bread, and after two or three days the growth was recognized as the common mould penicillium glaucum. In Fig I. is shown the mycelium, being formed by the growth from the germs (conidia which

FIG. I.



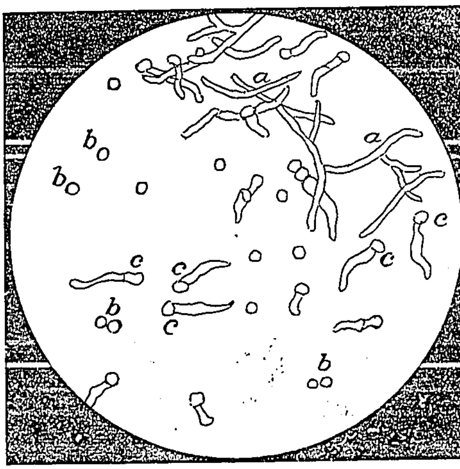
form the several centres of growth. An examination of a bag of this sugar, which up to this time had not been opened, showed that the growth of mould was all through the sugar; that near the bag where the sugar had taken up most moisture from the air, the growth was in an advanced stage, conidiphores being formed, and where the sugar was moist enough

FIG. II.



to form a semi-liquid mass, the mycelium was beginning to assume irregularly swelled shapes as in Fig. II., or to break up as in *a*, Fig III. As the centre of the bag was approached, the development became less and less advanced, but the centres of development were just as numerous. As these centres of growth, in addition to being numerous, were separate and

FIG. III.



distinct, it was proved that the growth of mould throughout the bag proceeded from germs which had been introduced into and disseminated through the sugar before it was placed in bags.

A portion of the semi-liquid portion taken from next the bag was placed under a bell jar, when in a day or so the mould developed vigorously on the surface, and a portion examined under the microscope presented the appearance shown in Fig. III. *a* is the old mycelium breaking up owing to submission in the semi-liquid mass; *b* are conidia, and *c* are conidia beginning a new growth on the surface of the medium. This portion soon became quite liquid and strongly acid.

It is well known that penicillium glaucum has the power of inverting cane sugar, and the rationale of deterioration of raw cane sugar from the growth of this mould seems to be: first, the growth of the mould on the crystals of comparatively dry sugar, such growth being in proportion to the access of moist air; second, this growth of mould inverts some cane sugar, and as inversion proceeds moisture is taken up from the air; and when the moisture taken up is enough to produce a mass like massecuite, the mycelium begins to break up and dissolve, growth taking place only on the surface of the mass; third, at this stage the sugar is in proper condition, both chemically and mechanically, for the growth of acid-producing bacteria, and if the other conditions of growth are right, the subsequent breaking up of the sugar will be very rapid.

In the case of all samples separate crystals were examined by spreading on a cover-glass, inverting over a hollow slide; when under the microscope, growths similar to that shown in Fig. I. were found growing on the crystals, the branches of the mycelium enveloping them much as an octopus might embrace its prey.

A microscope examination of sugar lots 2 and 3 showed similar growths of the same mould, and they were found even in the dry portion of the washed sugar polarising 99.5°, not in a vigorous condition it is true, but sufficiently to be identified.

The case in hand, then, was as follows: A lot of dry raw sugar was found to be undergoing inversion, due no doubt to the growth of the mould penicillium glaucum, which was found growing in such a way throughout the bags that the germs must have become mixed with the sugar before it was placed in the bags. The important questions to be answered were: How did the germs get in the sugar? How can their presence be prevented?

It is well known that the germs (conidia) of penicillium glaucum are universally present in the air. I have proved this to be the case here by experiments, the details, of which I will not go into now.

Taking for granted that the germs of this mould are destroyed at the temperature of boiling water, there is only one place in the process of sugar-making as carried on here, where these germs could gain access to the sugar so as to be mixed through it, and that is in the centrifugals. It is the practice here to dry the massecuite hot as soon as it is dropped from the vacuum pan, and the sugar is dropped from the centrifugals directly into the bags. In the process of drying sugar in centrifugals, there is produced by the rapid rotation of the machine a downward current of air along the central spindle, into the basket, and outward to or through the sugar. This can be proved by arranging a beam of light, which will show the dust particles in the air in such a way as to shine on the spindle of a running centrifugal, when the rapid current of dust particles downward and outward can easily be seen. The sugar, then, in the rapidly running centrifugal really serves as a strainer or filter for a considerable portion of air, and any germs carried in the air are of course deposited on the inner surface of the dried sugar, and when this is dug out they become mixed through the whole mass. A repeated examination of sugar, dried in a dusty atmosphere, has confirmed this.

It has already been stated that the germs of penicillium glaucum are probably always present in the air, and there is no doubt that windy and dusty weather they are present in very great abundance. It is worthy of note in this connection that, as far as as my knowledge goes, all sugars which have deteriorated have been made when there was a large amount of dust in the air, that is in dry windy weather; and it is also to be noted that the plantations which have become noted for producing sugar, which deteriorates in transit or storage, are situated in districts subject to dry weather and high winds. In districts where there is little dust or little wind, so far as I know, the sugar made does not deteriorate.

Since the germs of the invertive mould gain access to the sugar in the centrifugals, the prevention is a comparatively easy matter. Either closed centrifugals must be used; or something must be done to sterilize the sugar before it is dropped into the bags. Steam affords the readiest means of bringing about the latter; and at present I am using it in the following manner. Beside each centrifugal there is placed a 1-inch steam pipe supplying steam at 80 lbs. pressure; this pipe is fitted with a valve and a short piece of hose. After the brake has been put on the centrifugal, and just as it begins to run slowly, steam is turned on, and the end of the hose directed by hand against the surface of the dried sugar for about ten seconds. This use of steam dissolves very little sugar, aids in the drying, and prevents, I am sure, any great number of mould germs going uninjured into the sugar bags.

I have isolated the invertive ferment present in pencillium glaucum in an impure form in the following manner, operating both on the fermented sugar and on the mould itself grown on the surface of molasses. The sugar or mould was macerated with about four times its weight of glycerine filtered, and the filtrate mixed with four times its volume of 95 per cent. alcohol. The dirty white precipitate thrown down was removed by filtration, well washed with alcohol, and dissolved in water. This water solution inverted cane sugar at the ordinary temperature, but the action was much more rapid at 100° to 103° F.

Penicillium glaucum thrives best at a temperature of about 68° F., and some of the phenomena, connected with the fermentation and subsequently rapid breaking up of raw sugar, may have been due to the rapid development of this mould at the low temperature of a ship's hold, and subsequently rapid inversion by the invertive ferment secreted by the mould, when the sugar was transferred to the higher temperature of the refinery or store room.

That alkalinity of sugar is no preventive of deterioration from the growth of penicillium glaucum has been shown from the history of the sugars already given, and is still more conclusively proved by the following experiment. A 10 per cent. solution of raw sugar was sterilized by boiling for several hours; after cooling, caustic lime was added to different portions in the following proportion:—

(1) 0.1 grm. CaO per 10 grms. of sugar.
(2) 0.05 grm. CaO per 10 grms. of sugar.
(3) 0.01 grm. CaO per 10 grms. of sugar.
(4) No CaO

To each of these was then added a few crystals of the fermented sugar, precautions being taken in adding the sugar as well as the lime to prevent contamination from the air. In each of these solutions a growth of penicillium glaucum soon appeared, and the growth in No. 1 containing lime to the extent of 1 per cent. of the sugar was quite as vigorous as in the others.

In presenting this explanation of the depreciation of these lots of raw sugar, I do not say that it applies to all sugars which have deteriorated in transit or storage, but it certainly is one that could be applied to all such sugars without doing violence to any known facts or accepted theories; and it proves that the assertion that all sugars which deteriorate do so because too moist or not alkaline enough is unwarranted.

A STUDY OF COFFEE.

Advance sheets from the Department of State contain a very interesting study of coffee by Frank D. Hill, United States Consul at Santos, Brazil, from which we take the following:

VARIETIES OF COFFEE AND COFFEE TREES.

"Of the twenty-two varieties of coffee plants (a rubiaceous plant whose original habitat was Abyssinia), four belong to Asia, eleven to the west coast of Africa, two in Central and East Africa, and two in Mauritius. Among the different varieties, the following may be enumerated: Arabian, Mocha, Myrtle, Aden and Bastard, Moorish; Marrou, of Reunion; Monrovian, coffee of Gaboon; Saurine, yellow coffee (cafe amarello), red coffee (cafe vermelho), and the common coffee of Mexico and Central and South America. All these varieties are variously subdivided, taking name from the districts where they are produced or from ports whence they are shipped. For example, Brazil coffees are Rio, Santos, Bahia, Ceara, etc.

"The ordinary coffee shrub is an evergreen plant that grows to a height of about twenty feet, with oblong, ovate leaves. The fruit is a fleshy berry, having the appearance and size of a small cherry. Each fruit contains two seeds, embedded in a yellowish pulp, the seeds being inclosed in a thin membranous endocarp.

REGIONS SUITABLE TO COFFEE CULTURE.

"The regions best adapted to the cultivation of coffee in Brazil are well-watered mountain slopes, at an elevation of from 1,000 to 4,000 feet above sea level, in latitudes lying between 15 degrees north and 15 degrees south, although it is cultivated with success from 25 degrees north to 30 degrees south of the Equator, where the temperature does not fall below 55 degrees Farenheit. Frost is a deadly enemy of the plant, and excessive heat hinders its normal growth. The low, hot lands of Mexico, the Caribbean Sea region—which produces the best cocoa in the world—and the South Atlantic are not adapted to its culture, the coffee lands in all these regions being found on the highlands that rise from the sea. On the American continent, coffee is produced all the way from Paraguay to Mexico; the Argentine Republic, Chile, the United

States and Canada being either too far north or south for its growth.

"The shape, size, and color of the seeds are the points that determine the commercial value of coffee. The shape depends upon the particular part of the plant which the seed grows, the size upon the nature of the locality of the growth, and the color on the degree of maturity of the fruit at the period of gathering the crop.

"Brazil is the great coffee country of the world, being credited with 66 per cent. of the total product. Nearly all the twenty States that form this vast mesopotamia extending from the Amazon to the River Plate produce coffee; but the true coffee zone is confined to the States of Rio de Janeiro, Sao Paulo, Espirito Santo, and Minas Giraes—Sao Paulo being the banner coffee State. This coffee finds its outlet at the ports of Santos, Rio de Janeiro, and Victoria.

COFFEE IN SAO PAULO.

"A few words as to the cultivation, harvesting, preparation, grading, marketing, and exporting of coffee from the State of Sao Paulo.

"Plantations.—Plantations are usually made on hillsides—the plant growing even in crevices of rocks—plants being placed at intervals of ten or fifteen feet. Hillsides are preferred because less subject than low lands to frost. At the age of four years, the tree begins to bear; it reaches its best at ten years, but continues to bear up to twenty and even thirty and forty years. The life of a plantation properly cared for is, however, about thirty years. Frosts and droughts damage crops here: insects very little.

"Harvesting the crop.—The first flowering appears in September, and the berry ripens in April or May, when the gathering of the crop begins. The berries are stripped by hand. The berry contains two grains, with the flattened sides toward each other, each covered with an inner membrane called "pergaminho," and a thicker outer coat called "casquimho," and the outside tough rind or shell, casco. To remove these coverings, the berry is passed through the despolpadar, after having been washed in shallow cisterns. It is then dried—either spread out on a cement-covered pavement, called "terreiro," in the sun, which is the old way, requiring about two months, or by the modern method of steam, which is used on the large fazendas, or plantations. After drying, the coffee, still inclosed in the inner and outer skins, is passed through machinery to prepare it for marketing. This machinery consists of the ventilador or windmill, brunidar or descascador, and polisher or sheller.

"Marketing the Crop.—The crop begins to reach Santos about May, the largest receipts being credited to the latter part of the second semester of the year. Formerly, the planter sent his product to Santos in bags of any size, and the commissario (his agent, a very important man in coffee business) placed it in the standard coffee sack of sixty kilograms (132,276 pounds) for export. In Rio de Janeiro there is still a class of middlemen called "ensaccadores," who buy from the commissario and sell to the exporter, reaping a profit on the resacking. In this State, on the contrary, the planter sacks his own coffee in the regulation sack. The commissario, who is accustomed to advance large sums of money on growing crops, receives, besides interest on these loans, a profit of 3 per cent. for his intervention in receiving the coffee and selling it to the exporters. This sale is made by a coffee broker, who receives 75 reis (1.05 cents) per bag from both buyer and seller. It will be perceived that the commissions of some of the leading brokers on large sales made daily afford a very comfortable income. The last man to be considered here is the exporter or his agent. He is, of course, the natural business enemy of the others, as he represents foreign interests who are desirous of buying as cheaply as possible, and he wishes to obtain a margin. Some of the large export houses, as Naumana, Gepp & Co., Zenner, Bulow & Co., and Goetz, Hayn & Co., buy direct to some extent from the planters, thus cutting off all middlemen.

"Business Methods.—A publication of the National Association of Manufacturers has the following on the methods of doing business at Rio de Janeiro and Santos:

Rio de Janeiro and Santos are the principal ports from which coffee is shipped. The manner in which the coffee business is conducted in Rio is somewhat different from the method followed in Santos, and a few remarks on the subject may be of interest. In Rio the commissarios, or planters' agents, sell to the ensaccadores, or intermediates, who classify and sack the coffee. Each coffee-exporting firm employs its own brokers to buy from the intermediaries. The broker's interest, therefore, is to act solely on behalf of the exporter, and, as he is well posted on the stock and requirements of the market, and as the intermediaries have the coffee ready for sale, duly classified, he can generally procure the exact number of bags of any type he may be instructed to purchase.

It is not so in Santos. There the planters' agents sell direct to the exporting houses, employing their own brokers. The latter's interest is, therefore, with the growers. The coffee is not classified as in Rio, but is simply sold in lots. An exporter who has to execute an order for a certain type of coffee, may have to buy in excess of his needs, in order to be able to separate and obtain the quality and quantity required. The remainder, should it not be of a standard suitable for shipment, must be disposed of in the market. In either case, the exporter naturally regulates his invoices so as to cover any loss the transaction may entail. It will be seen that with greater capital and the employment of thorough experts to buy the coffee, the Santos market offers every inducement to exporting houses. They would not only save profits, by saving the intermediaries' commission, but often, by careful selection and judgment in shipping, surpass their expectations.

"Coffee Grading.—Coffees are graded in this market as follows:

"Fine.—Consisting of clean coffee of regular bean.

"Superior.—Beans regular in size, but may contain a few husks or black beans, called "quakers"—sticks, stones, and dirt not allowed.

"Good.—Evenness of bean not absolutely insisted upon; may be black beans or husks, and even a few broken beans. Sticks, stones, and dirt excluded.

"Regular.—In this grade defects appear, large quantities of black beans, hulls, stones, sticks, or dirt.

"Ordinary.—Contains foregoing defects and some broken beans.

"Triage.—The last or lowest of grades is made up of broken beans, and has all the other defects enumerated.

"In the vernacular (Portuguese) these six grades are fino, superior, bom, regular, ordinario, and escolha. The berry is sometimes colored before shipment and sometimes milled. The export firm of Rose & Knowles is successful, and another mill is being built, whose owner proposes to mill 500,000 bags (66,000,000 pounds) a year. Coffee, for the Cape of Good Hope, for example, is artificially colored black to meet the taste of that market. There are two classes of beans—flat and round—and this determines the classification of the berry. The former is the Java, the latter the Mocha type. The round pea-berry, or Mocha type, represents 3 to 6 per cent. of the production. It is graded to-day 2 milreis above the "base" or standard price. The same tree produces both varieties.—Am. Grocer.

———:o:———

INFLUENCE OF BEES ON CROPS.

(Albert Gale in N. S. W. Ag. Gazette.)

That pollen is the vital agent in the production of all fruit crops, and also the life-cell in the reproduction and perpetuation of all phanerogamic plants, *i.e.*, plants having conspicuous flowers, has already been shown. In this division of the vegetable kingdom it has been pointed out that reproduction is the result of a union between ovules and pollen grains, the former being the cells of matter, and the latter the life-cells. The methods or agents employed by nature to bring about this union are various. In nearly all of them, excepting that of the union that is produced by insects, it is extremely haphazard. Indeed, the union that is brought about by insects is almost as fluctuating as that of other agencies, if we except the bee family, and this family must be gradually narrowed down to the hive-bee as the one par excellence in the art of fertilization. In the majority of entomophilous plants it is almost impossible for fructification to take place but by contact with an outside agent, and the only agents designed by nature by their construction, instinct, and domestic requirements are members of the bee family. In all parts of the world there are many thousands of species and varieties of insects. Yet out of this vast army of unique and, in some instances, grotesque forms, having peculiarities adaptable for the life they have to lead, and for obscuring themselves from enemies by resembling the plants, etc., upon which they live, the only ones that collect and store pollen are bees. When other insects carry pollen it is entirely accidental. Bees cannot live without it. It is their bread of life. Their young cannot be nursed to perform the active duties they have to follow without it. In the insect world there are artisans in paper making, in spinning, in weaving, in basket-making; in house-building, in masonry, in sawing, in carpentry, in upholstering, etc., each one of them having tools or instruments specially suited for carrying out the work nature has intended them to perform; but the only ones having instruments and appliances for gathering, carrying, and storing pollen are bees. Pollen is removed from the anthers and conveyed to the receptive organs of flowers by every variety of insects that alights on them during the time the pollen is distributive. By reason of the viscid nature of the pollen grains of most entomophilous flowers it adheres to the body or legs of any insect that may chance walk over it, and is conveyed by them elsewhere. If it were brought in contact with the pistil of a flower of its own variety, the act of fertilization would be as efficacious as if it were carried by bees; but these cases are purely accidental, and the successes are only "few and far between." Not so with the bee. Every movement of a bee in the direction of fertilization is a studied one designed purely by Nature to accomplish the perpetuation of the plant it is at work upon. The anthers of some flowers are so situated as to discharge the pollen only on some very particular spot of the external anatomy of the bee—her head, upper surface of the thorax, chest, tongue-sheath, etc., and the stigma is so placed in the flower that only that portion of the bee that has received the pollen would be capable to effect the purpose.

I have used the term bees (Apidæ) frequently to indicate any member of that extensive family, but all or every variety of bee although both, honey and pollen gatherers, are not capable of general fertilization. It is only the most highly developed bees (humble bees and honey bees) that are furnished with apparatus suitable for collecting and carrying pollen from flowers of all forms or designs. Mason bees and leaf cutters (Osmia and Megachile) have the ventral surface of the abdomen furnished with long stiff retroverted hairs. These hairs by pointing the "wrong" way brush the pollen from the anthers as the insects pass in and out of the bloom. Grains of pollen become entangled among them, and by this means they are transported elsewhere; the hairs on the abdomen of such insects are beautifully adapted for the fertilization of flowers having a broad and flat corolla, and the reproductive organs being protuberant or conspicuous. If the female organ be hidden lower down in the narrow tube that some blossoms possess, such as clover, etc., they are utterly incapable of performing the uniting ceremony required to produce a fertile seed. An examination of the hinder leg of one of the hairy bees will show white specks indicating the pollen collected in the hairs afterwards to be transferred to the pollen baskets. In the hinder leg of one of the humble bees (Bombus terrestris), the arrangement of the pollen-gathering hairs are carried out with greater perfection, but the hairs are distributed in the same irregular manner as in the hairy bee. In that of the ordinary honey bee (Apis mellifica), the pollen-collecting hairs are much better adapted to their designed use than is the case with the two former. The hairs on that section (tarsus) of the leg are arranged, not in the irregular way as is the case in that of the humble bee, but in eight or nine regular rows. This regularity of the arrangement of the hairs of the pollen-brush enables our domesticated bee to brush the grains of pollen from the anthers far more effectively than is the case with any other member of the species. Whilst she is at work on the flowers she is constantly transferring these grains to the pollen baskets, but all are not stored therein; some escape, and it is these escapees that do the work of fertilization.

I think I have pointed out clearly that there is no insect so highly developed for carrying the imperatively essential pollen from flower to flower as the hive-bees. Their intelligence, their energy, their social habits, and the ease with which they are kept under control stamp them at once as no mean ally to the tiller of the soil. The practical beekeeper in any district is a confederate that should be welcome to all. The indiscriminate destruction of native honey-producing flora should be carefully avoided, because most of the plants that I have referred to in these articles are exotics, and these, as a rule, bloom in the early spring and summer for the raising of young brood. The stores gathered from indigenous summer and autumn flowers are to carry them over the severity of winter. If there be not sufficient storage when the cold and wet season sets in to carry them through till springtime it will cause an insufficiency of bees to do the work nature has assigned for them, and the result will be a lesser ingathering of the fruits of the tillers' labor. Landowners and others cannot have the remotest idea of the mischief they are doing to the vegetable kingdom, and therefore to mankind, by the wholesale destruction of our native flora. If these are wholly, or nearly wholly, cleared from the land to the extent of giving insufficient winter storage for our bees so as to decimate them to the extent of their numerical inability to carry on the necessary work of fertilization the result will be more disastrous than droughts or floods, because our fruit trees, etc., would cease to yield their crops.

The sons of our agriculturists and others engaged on the land are instructed in pruning, grafting, budding, and other concomitant adjuncts for procuring a living from the soil, but none of these are more necessary than an acquaintance of bee-management—the practical part of it at least. Apart from the profits from the sale of the honey obtained from the bees, or that used in the home (there is no food more healthy and invigorating), the presence of bees on a homestead are as necessary as the implements of husbandry, nay indeed more so.

:o:

A COMPLETE FOOD SHOW.

Few perfect food shows have been seen in this country, because such displays conducted by grocers' organizations, manufacturers' associations, or by private interests, have not been comprehensive habits, but mostly displays of proprietary goods.

This week, on Monday, the second annual food show of Siegel-Cooper Company was opened at the "Big Store," on the fourth floor, where it occupies nearly 100,000 square feet. It is an inspiring, animated scene. Two bands—the Hungarian and the Vienna—discourse music in a vast room radiant with emblems of patriotism, and beautiful with its setting of palms, ferns, and other plants. The greatest interest centers about the exhibits of food, which we believe to be the most extensive ever seen in one place at one time in the United States.

Throwing aside sentiment, locking up prejudice, let us view this great display as an exhibition designed to demonstrate to millions the evolution that has been going on in the food supply, and how chemistry, the factory, and machinery have combined and contributed to raise the quality of food and prepare it in such a manner as will save the housekeeper the greatest expenditure of time, trouble and money. Such a comprehensive exhibit as this, in which is displayed every article of food and drink to be found in first-class groceries, markets, delicatessen stores, or liquor shops, is an object-lesson the people can never forget. It is a practical demonstration of how science, skill and invention work together to produce food at the lowest possible cost and in the most perfect manner.

At this grand exhibit visitors are shown how the cream and the milk are separted, and the cream churned by electrical machinery; they may look into 250 feet of old-storage room, and find perishable fruits, vegetables, meats, and fish perfectly preserved until ready for delivery to the buyer; they can walk around a large oblong space enclosed in marble-top counters, and inspect the most extensive display of delicatessen to be found in Greater New York. Let us pause right here, and study this section where cooked food is sold.

In the center of the oblong enclosed are two display counters with marble top, supporting, by means of nickel-plated pillars, a convex roof of red, white and blue crumpled bunting, and illuminated from the inside by electric lamps. This roof rests upon a transparent glass freize, upon which appears the names of articles sold, such as relishes, olives, sausages. Along the outer counters are nineteen tall, round glass jars, with cover, in which are lambs' tongues, pigs' feet, chowchow, pickles, white onions, olives, and other similar relishes. Large rounds of roast beef are separated from rolls of cooked hams by dishes of potato salad, or by great dishes of baked beans, chicken patties, pork and mutton pies, smoked sturgeon, frankfurters, cervelat sausage, lachs shimken, boiled tongue, pickled tripe, and scores of other articles—all ready for use. And how cheap! For one pound of baked beans we must pay 5 cents; for a chicken pie, 9 cents; pork and mutton pie, 5 cents; roast beef, 30 cents per pound, or the same price for boiled ham; 5 cents for pickled tripe; 25 cents for smoked sturgeon; 12 cents for frankfurter. What a boon to the people of this great city, crowded into stifling tenements, or living in flats resembling huge coffins, with a window at either end, to be able to buy food for immediate consumption, and at a price lower than the cost if they were to prepare the same things at home.

In addition to the usual display, there are now forty-five booths, pavilions, pagodas, castles, octagon temples, hexagon stands—some with peaked, others with pyramidal, convex, or variegated roofs. These are brilliant in colors.

In the southwest corner there is a large oblong pavilion, covered with diagonal folds of red, white and blue bunting. From this 3,000 articles are given away free to the first 3,000 visitors; the first 500 receive a Rogers' 1847 silver-plated spoon, the remaining 2,500 some well-known article of food or household goods. In the center of the west front is a double booth in white and gold connected with a large horseshoe of electric lights. Here and at a magnificent pavilion opposite "Hazel" brand goods are displayed. This is the special brand of the Siegel-Cooper Company, and covers only goods of the very highest grade. It is quality that is relied upon to win popular favor, and not, as so many suppose, cut prices. Possibly it is true that a miscellaneous order for general groceries can be bought as cheap or cheaper in strict groceries than at Siegel-Cooper Company's, in which case it must be something else than price that draws patronage to the department store. We believe it is service of the highest order, and that any grocer who renders equally as meritorious service need not fear the competition of the big stores.

The center aisle is a great sight, lined throughout its whole length with ornamental structures in pale blue and white; lilac and white; pure white; pale green and scarlet; red, white, and blue; red and white. Prominent among these is the display of the Anderson Preserving Company, Camden, N. J., another illustrative exhibit showing how carefully the factory puts up a great variety of food for quick use, such as concentrated soups, jams, jellies, compressed mincemeat, and catsups.

A Dutch cottage, with roof in empire green, salmon pink and cream white sides, with gold stripes, is occupied by Van Houten's Cocoa. Among other exhibitors and demonstrators are Armour & Co.; Armour Packing Company; N. K. Fairbank & Co.; Swift & Co.; Thomas J. Lipton Company; Potter & Wrightington; Joseph Tetley; Anker's Bouillon Capsules; Suchard's Cocoa; Huckin's Soups; Price's Baking Powder; Ceylon Spice Company; East Indies Tea Company; Wisconsin Condensed Milk Company; George Mason & Co.; Fels-Naphtha Soap; Mullen, Blackledge & Co.; Battle Creek Sanitarium.

Every day there is a lecture and demonstration in cookery by Mrs Janet McKenzie Hill, editor of the Boston Cooking School, or by a chef from one of the many famous hotels of Manhattan.

Great crowds surge through the various sections, intent on becoming acquainted with the articles which contribute to good living, and in acquiring information as to the best methods of preparing food. This food show is a great educational institution, in charge of expert teachers. The magnificent display of food products affords room for days of profitable study, and is highly suggestive. We trust that every grocer—wholesale and retail—within reach of New York will visit this exposition, for we feel certain that no man of receptive faculty can do so without profit. To those grocers whose antagonism to department stores blinds their judgment, we suggest a visit, for some of the scales of prejudice will be rubbed from their eyes, and they will go back to their single shops with a good many ideas that will, if carried out, make their stores more attractive, besides reducing unfair competition. Mr. Butler, the manager of the grocery section, has wrought a great work, and we are glad to credit his push, skill, sagacity, and enterprise.—Am. Grocer, July.

:o:

AGRICULTURAL CHEMISTRY—A QUARTER OF A CENTURY'S PROGRESS.

The last twenty-five years of agricultural research have witnessed momentous changes, and none more complete perhaps than the now general recognition of chemistry alone being unable to grapple with the practical side of agriculture. In an important address delivered towards the close of last year by the celebrated Professor Maercker, of Halle, to the German Chemical Society, a lucid review is given of the progress of Agricultural Chemistry. Analytical Chemistry, pure and simple, no longer holds the commanding position it did. On the contrary, the Agricultural Chemist is now often more concerned with the biological sciences than with the chemistry. The three most important divisions of latter-day agricultural research are Plant Food, Soils and Manures, and lastly, Artificial Selection.

Plant Food.—Until the quite recent introduction of water and sand cultures, very little was known of the forms and quantities of the nourishment required by plants. By means of these cultures, from which all extraneous influences are rigidly excluded, we can trace the action of many substances in the plant itself. Thus we know that nitrogenous substances in the plants cannot be formed without the aid of phosphoric acid, for the albumens, which are of such transcedental importance in the transformation of substances in plants, result from an intermediate phosphoric acid compound. Again, iron is an essential constituent of chlorophyll, as sulphur is of albumen. The true action of calcium was long doubted. It is now known to be of a medicinal character, serving to neutralize the poisonous oxalic acid, which is always an intermediate product of the carbo-hydrates. Potash again has the closest of relationship with the formation of sugar in beets. Magnesium appears to be of importance in the formation of nitrogenous compounds in seeds, while nitrogen is of course indispensable, being an essential constituent of albumen.

Wolff has conducted some curious experiments, proving what he calls the "mineral hunger" of the plant. In other words, though a certain minimum amount of minerals may suffice to induce a healthy growth, all plants grown under normal conditions contain a great excess of this minimum. Oat-plants for instance require for their healthy growth the following minimum amounts of important minerals:

Phosphoric acid	.50	parts.
Potash	.80	"
Lime	.25	"
Magnesia	.20	"
Sulphuric acid	.20	"
	1.95	"

But no oat-plant in nature contains under 3 per cent. of minerals. The difference, 1.05 represents the mineral hunger of the plant, such excess of mineral not performing any special function. As it might well be applied in the form of an indifferent substance like silica, it shows that it is not economical to manure crops with pure substances.

Soils and Manures.—Knowing what the plant requires as food, the problem to be now solved is how to apply it in the soil itself. Unless accompanied by a "mechanical analysis," meaning chiefly a determination of the amount of finely divided constituents in the soil, it has been found the chemical analysis of a soil is of little use as a guide. It is only the finely divided earth which presents a sufficiently large surface for the exercise of the solvent action of water and its dissolved carbonic acid. Where only traces of an important plant-food are found, there is of course no question as to the advisability of supplying that constituent.

On the other hand nitrogen for instance may be revealed in great quantities by analysis, yet plants growing on such soil may require liberal doses of that element to enable them to thrive. For in the form of humus or mould, a very large proportion of the nitrogen is quite unavailable as plant-food.

Phosphoric acid affords another illustration. When applied in a soluble form it is of course available to the plant, but in time may change into insoluble tricalcium phosphate, or even to iron or aluminum phosphates, which are still less soluble.

Calcium or lime, however, may be easily determined by analysis, since it is chiefly valuable in the soil as carbonate or humate, and these are easily estimated in the soil.

Direct analysis being then a failure, attention has been turned, and with great success, to the indirect or cultivation method, in other words, letting the plants themselves determine the quality of the soil. Most of our readers are probably well-acquainted with this method, commonly known as Ville's test-plots. A sufficiency of each and every constituent of plant-food is given, save one. The plants are then analysed and compared with plants grown on soil containing the complete plant-food, and one important result of this method has shown that different plants take up very different quantities of the same mineral substances. The system of rotation of crops is based on this fact.

By means of the cultivation method a very useful table has been drawn up showing the relative value of the different nitrogen compounds as plant food:

Nitrogen in saltpetre (nitrate of potash)....	100
Nitrogen in ammonia....................	85 to 90
Nitrogen in albumen....................	60

These test plots may also be used for testing the value of manures of all kinds, as in the case of "Thomas" slag, which is now used to an enormous extent as a phosphatic manure. Similar experiments with regard to potassic manures have given a great impetus to the potash industry. The "cultivation method" of analysis has given us almost control of the fertility of a soil, as far as this depends on manuring. It has taught us amongst other things that sandy soil, so long considered almost barren, can be made extremely fertile by the scientific addition of manures.

A last point, and one to be well borne in mind by the unscientific rule-of-thumb planter, is that the supply of excessive nourishment is a disadvantage and only tends to produce sick plants.

ARTIFICIAL SELECTION.—This branch of agricultural research is one of enormous importance, though still in its nearest infancy. By its aid the fertility of plants may be increased far beyond the limit which Nature appears to have fixed. German agriculture would long since have broken down under the stress of foreign competition had it not been for the perfect technology of its agriculturists. The very success achieved spurs them on to greater efforts. We planters, who, as a class, are so woefully behind the times, have never tried to perfect our technology in a scientific way. And it seems as if the day of our first united efforts were still far distant.

To return to artificial selection. The case of the fight of the sugar-beet against cane sugar affords a splendid instance of the triumph of scientific agriculture over rule-of-thumb methods, though aided by cheap tropical labor. Originally the sugar-beet contained only a small proportion of sugar, and could only be used for sugar manufacture when the price of cane sugar was very high. We will quote here the words of the Imperial Institute Journal: "With the fall in price came the urgent need for increasing the percentage of sugar in the beet-root. This was effected by utilizing the fact that sugar richness is hereditary, so that by selecting artificially the roots richest in sugar, getting seed from these, planting the seed, again selecting the richest roots and so on, a race of plants is at length obtained in which a high percentage of sugar is normal." The beet industry now support great laboratories for carefully determining the percentage of sugar. By these and other efforts sugar is cheaper now in Germany than flour, costing less than a penny a pound.

What is this but the methods we have so persistently advocated in improving our coffee-strains? Yet, because planters as a class are so utterly unfamiliar with the methods of scientific agriculture, they look upon such questions as impracticable. They are impatient of delay, results that cannot be obtained in a year or two, are not, so they opine, worth obtaining at all.

Success similar to that obtained in the sugar-beet has also been attained in the different crops of grains, malt-barley being a special case in point.

Highly-cultivated and artificially selected plants easily lose their acquired characters when exposed to unfavorable conditions. This has led to a series of exact investigations, the most interesting being the tracing of the history of nitrogen as it passes from the atmosphere to the soil, then into the substance of plants, and finally into the atmosphere.

As a rule plants can only assimilate nitrogen in the form of compounds. But the supply of these compounds in the atmosphere is comparatively small. There must be some other source of supply. This is the order of leguminosæ or nitrogen-collectors, and so enrich a soil in which they have been grown, with nitrogen compounds. This power of collecting free nitrogen has been always associated with the presence of micro-organisms in the roots.

The Imperial Institute Journal, on which we dwell at length, says: "Leguminous plants, whether first used for fodder for animals or simply left to decay in the soil, have their albumen changed in the first instance to amides, which under the influence of ammonia ferments are decomposed with formation of ammonium carbonate. The saltpetre bacillus then converts the ammonium carbonate (and probably also amides) into saltpetre, *i.e.*, into the best form of nitrogen plant-food."

Unfortunately, the whole of the nitrates thus produced cannot be taken up by plants on account of the destructive action of the nitrate-destroying bacilli (full mention of which has already been made in this Journal which decompose the nitrates and set free the nitrogen, which passes again into the air.

These nitrate-destroyers are usually present in stable manure and cause a loss of many millions of pounds annually to German agriculture. Efforts, which is believed will result in early success, are now being made to avoid this loss.

* * * * * *

With even this brief review before him of the progress of agricultural science during the past quarter of a century, can the reader seriously affirm that scientific agriculture is useless, that it is not worth spending a few rupees on? We in South India have only two staples. Both are fighting their way exposed to the fierce competition from other countries. If we lag behindhand in the struggle, if we disdain to use the weapons lying at our command, we may be sure that our rivals will not be so apathetic. It is worse than useless to make light of the gravity of the struggle Individuals, by the application of that foresight so deplorably lacking in the community at large, may weather the storm successfully. But individuals cannot hope to save an industry by their private efforts. It behooves us all to stand shoulder to shoulder, to join our resources and fight our way as a whole. We can easily help ourselves. If we fail to do so, the fault is ours and ours alone. Patent systems of curing leaf-disease and other ills our plants are heir to will not save us. In scientific agriculture and in that alone lies our salvation.—Planting Opinion.

:o:

THE KENTUCKY PURE FOOD LAW.

The Legislature of Kentucky at its last session passed "An Act Regulating the Manufacture and Sale of Food," which went into effect June 13, 1898. Under this law, any person manufacturing, or selling, or exposing for sale any article of food or any article which goes into the composition of food, as pure or unadulterated which is adulterated or misbranded, is subject to a fine not to exceed $500, or not more than one year imprisonment.

The terms "adulterated" and "misbranded" are clearly defined in the law. So many inquiries, however, have been made in regard to labelling different articles of food so as to comply with the law that it has been thought best to present herewith a few provisional definitions of terms for the purpose of illustration.

Antiseptics.—Salicylic acid, benzoic acid, boracic acid, or any of their compounds, or any other antiseptic or objectionable preservative must not be used in catsup, mincemeat, canned meat or fish, canned vegetables, or any other article of food, unless the presence of such antiseptic is plainly indicated on the label.

Baking Powder.—Baking powders are known as cream of tartar, phosphate, alum-phosphate, alum baking powders, etc., depending upon the acid substance used to liberate the carbonic acid in soda carbonate contained in every baking powder. As some of these acid materials are considered more or less injurious to health, and as some are much cheaper than others, it is necessary, in order to comply with the law, to designate the kind of baking powder on the label, as cream of tartar baking powder, phosphate baking powder, phosphate-alum baking powder, or alum baking powder.

Butter.—Butter should contain at least 80 per cent. of pure milk fats. Butter made by the use of "black pepsin" or other substance, in order to incorporate large quantities of water and casein, is adulterated.

Where other fats or soils are substituted, in part or whole, for milk fats in butter, such article cannot be sold as "butter," or "creamery," or "dairy butter," or any combination of words embracing the word "butter," but must be classed as "oleomargarine" or "butterine," and so plainly labelled.

Butterine or oleomargarine, or kindred compounds, can only be manufactured and sold in this State when put up in "such package and manner as will advise the customer of its real character, free from coloration or ingredient that causes it to look like butter."

Cheese.—Cheese not made wholly from milk or cream, salt, and harmless coloring matter, is considered adulterated, and must be sold as "filled cheese," or the name and amount of the adulterant must be made part of the label. Cheese made from milk from which part of the cream or fat has been taken must be so labelled, as to indicate the amount of cream or fat taken from the milk of which it was made. Cheese containing less than 10 per cent. of fat must be labelled "Skim milk cheese."

Coffee.—Any article offered as coffee which contains any substitute for the coffee bean in any proportion is considered adulterated, and cannot be offered for sale unless the quantity and kind of such substitute is given as part of the label.

Candy.—The use of harmful coloring matters or other ingredients, and the admixture of terra alba, kaolin, or other mineral substances to give weight and volume to the mass, are adulterations. Where glucose is substituted in part or whole for cane sugar, its presence must be indicated on the label.

Cider.—Cider is the unfermented juice of the apple. Any substitute for apple juice, or any antiseptic added constitutes an adulteration, and such adulterated cider cannot be offered for sale unless the name of the adulterant is made a part of the label.

Flour.—Flour is commercially known as the fine and bolted meal of the wheat grain, and for the purpose of this law is so defined. When mixed with the product of any grain, except wheat, it is adulterated, and cannot be offered for sale unless the kind and amount of the admixture is made part of the label.

Fruit jellies, fruit butters, preserves, canned fruits, fruit conserves, confections, fruit juices and syrups, etc., must consist of the fruit specified in the label, preserved only with cane sugar (sucrose), and must not contain artificial flavors, coloring matters, or antiseptics. If such articles contain any substitute for the fruit, or any inferior material to make up bulk or weight, any glucose or other substitute for sugar, any artificial flavor or color, any starch or animal gelatine, any salicylic acid or other antiseptic, or any substance not naturally occurring in such fruits, except spices or other wholesome, natural flavoring materials, they are adulterated, and cannot be offered for sale unless the presence of all such substances is clearly indicated by the label.

Honey.—Honey is the nectar of flowers and other saccharine exudations of plants gathered by bees. Honey made by feeding bees glucose, sugar, invert sugar, or other saccharine substance, is not pure honey. Adding sugar, invert sugar, or glucose to honey constitutes an adulteration, and such adulterated honey cannot be sold unless the quantity and name of the adulterant is made part of the label.

Lard.—Lard is the fat of swine, the fat being melted and separated from the flesh. Adding beef fat or stearine, cottonseed oil, or other substitute for swine fat, constitutes an adulteration, and such adulterated lard cannot be sold unless the quantity and name of the adulterant is made part of the label.

Milk.—Milk should contain at least 12 per cent. of total solids and 3 per cent. of fat. Milk containing less than these proportions will be considered adulterated unless labelled or offered as "skim milk," or milk below standard. The addition of antiseptics or preservatives is an adulteration.

Molasses and Syrups.—All molasses and syrups are assumed to be made from the juice of cane, or other sugar-producing plant, or the sap of the maple tree, and any syrup or molasses containing starch-sugar, glucose, or corn syrup is considered adulterated unless the label indicates the presence of the same.

Olive oil is the expressed oil of the olive. The substitution of other oils or fats for olive oil, either in part or whole, constitutes an adulteration, and such adulterated oil cannot be offered for sale unless amount and kind of the adulterant is shown clearly on the label.

Spices, mustard, pepper, etc., must not contain any foreign substances or coloring matter introduced to dilute or cheapen the article, and any such admixture constitutes an adulteration, and cannot be sold unless its kind and amount are indicated on the label.

Tea.—Tea consists of the dried leaves of the true tea-plant, without addition of artificial coloring matter, or filler, or extraction of any essential properties, and any article offered as tea which does not conform to this definition is considered adulterated and cannot be offered for sale, unless its true composition is given as part of the label.

Vinegar.—Standard vinegar is a vinegar made from the juice of the apple, containing not less than 1½ per cent. of apple solids and 4 per cent. acetic acid. All vinegars labelled "apple," "cider," or "orchard" vinegars are assumed under the law to be standard vinegars. Vinegars not made of the juice of the apple must be labelled truly of what they are made, as "malt vinegar," "distilled vinegar," or "wine vinegar." Otherwise, they are to be considered adulterated. If artificial coloring matter is used, this must be stated on each and every label. Vinegars to which other acids than acetic acid have been added are adulterated.

Vinegars containing less than 4 per cent. absolute acetic acid may be sold, provided the percentage of acetic acid is made part of the label..

M. A. Scovell,
Director Kentucky Agricultural
Experimental Station, Lexington, Ky.

—Am. Grocer.

SUMMARY OF WAR TAXES.

*Beer, ale and other fermented liquor, per barrel	$ 2 00
Tobacco—Manufactured, per pound	12
Cigars, cigarettes, over 3 lbs. per 1000	3 60
Cigars, under 3 lbs. per 1000	1 00
Cigarettes, under 3 lbs. per 1000	1 50
Tea, imports, per pound	12
Bank capital, including surplus over $25,000	50 00
For each $1000 over $25,000	2 00
Brokers in negotiable securities	50 00
Pawnbrokers	20 00
Commercial brokers	20 00
Custom house brokers	10 00
Theatres, museums, concert halls, in cities over 25,000 inhabitants	100 00
Circuses	100 00
Other shows and exhibitions	10 00
Bowling alleys, billiard rooms, per alley or table	5 00
Tobacco—Dealers—Leaf tobacco, sales between 50,000 and 100,000 lbs.	12 00
Sales over 100,000	24 00
Manufacturers—Sales under 50,000	6 00
Sales between 50,000 and 100,000	12 00
Sales over 100,000	24 00
Manufacturers of cigars—Sales under 100,000	6 00
Sales between 100,000 and 200,000	12 00
Sales over 200,000	24 00
Stocks bonds debentures, certificates of indebtedness issued after July 1, 1898, per $100 face value	05
Transfers of Stocks, per $100 face value	02
Sales of merchandise for present or future delivery on exchanges, per $100	01
Bank check or sight draft	02
Bills of exchange (inland) time draft and promissory note, money orders, for each $100	02
Bills of exchange (foreign), letter of credit, drawn singly, per $100	04
In sets of two or more for each bill	02
Bill of lading, or receipt for any goods to be exported	10
Bill of lading to be issued by express and transportation companies, per package	01
Telephone messages, charged at 15 cents or over	01
Surety bonds	50
Certificates of profit, memo. showing interest in corporation, or transfers of same, per $100 face value	02
Certificate of demange, and certificates of port wardens or marine surveyors	25
Other certificates not specified	10

*7½ per cent. discount allowed.

Charter party, per vessel of 300 tons	3 00
Between 300 and 600	5 00
Exceeding 600	10 00
Contract, broker's notes of sale or exchange of goods, stocks, bonds, notes, real estate, etc	10
Conveyances, value between $100 and $500	50
Telegraph messages	01
Custom house entry, not over $100	25
Between $100 and $500	50
Over $500	1 00
Custom house entry for withdrawal	50
Insurance (life), for each $100 of policy	08
Industrial weekly payment plan, 40 per cent. of first weekly payment.	
Leases—for one year	25
Between one and three years	50
Over three years	1 00
Manifest for custom house entry or clearance for foreign port, per ship of 300 tons	1 00
Between 300 and 600 tons	3 00
Exceeding 600 tons	5 00
Mortgage, between $1000 and $1500	25
For each $500 additional	25
Passage ticket to foreign port, costing not over $30	1 00
Between $30 and $60	3 00
Over $60	5 00
***Power of attorney to vote	10
****To sell, rent or collect	25
Protests of notes, etc	25
Warehouse receipts	25
Medicinal proprietary articles and perfumery, cosmetics, etc., per package of five cents, retail price	.00125
Between 15 and 25 cents	.00625
Chewing gum, per package of $1, retail value	04
Sparkling or other wines, per pint bottle	01
Petroleum and sugar refining or transporting oil or other products by pipe line, excise tax on gross receipts exceeding $250,000	0025 per cent.
Palace or parlor car seats or berths, per seat or berth	04
**Legacies between $10,000 and $25,000 to lineal descendant, or brother or sister of testator, per $100 clear value	75
To descendants of brother or sister of testator	1 50
To brother or sister or father or mother of testator, or their descendants	3 00
To brother or sister of grandparents of testator, or their descendants	4 00
To other beneficiaries	5 00

**Wives and husbands exempt.

***Religious, literary, charitable societies and public cemeteries exempt.

****Claims against United States exempt.

Tax on legacies between $25,000 and $100,000, multiplied by one and one-half.

Between $100,000 and $500,000, multiplied by two.

Between $500,000 and $1,000,000, multiplied by two and one-half.

Over $1,000,000, multiplied by three.

Mixed flour, dealers, per annum	12 00
Per package, imports included, between 98 and 196 lbs	04

:o:

THE PINEAPPLE IN FLORIDA.

Orlando, Fla., July 2, 1898.

Cor. American Grocer:

I want to tell your readers something about the pineapple industry in Florida—how they are propagated, grown, cultivated, and marketed, and who buys them. Persons outside the State have but little conception of the wonderful growth and magnitude of the industry, especially for the past year or so. A few of the pioneers in the business have made a fortune out of it in the sale of fruit and scions, and their success has given the industry a most wonderful impetus. Pineries have therefore multiplied a hundred fold.

It is a well-known fact that the best pineapples grown in the world are produced right here at Orlando. Soil and climatic conditions seem to be just right, hence the phenomenal size and fine quality of fruit grown. The five leading varieties are the Smooth Cayenne, Abbakka, Golden Queen, Enville City, and Prince Albert, the first named being the favorite, as the leaves are devoid of prickers, hence better to handle. In quality there is but little difference in the varieties named, the first having little less of the tart flavor than the other four, but all are most delicious, the usual woody fiber and core being found almost entirely absent; so that lovers of this fruit often eat it with a spoon, without preparation for table, the same as you would a cantaloupe. This fruit grows with us to a most astonishing size, weighing from six to twelve pounds each. The sorts I have mentioned are good keepers and would easily stand a shipment of two or three weeks. They are packed in cases holding sixteen to twenty-four apples, excelsior being used to prevent abrasion.

The fruit in this section is all grown under cover, in pineries; the sides are boarded up tight, the cover put on with 1x3-inch slats, every other space being left open to admit rain and modified sunlight, and to keep out cold. Pineries are built six feet in clear, to enable one to walk upright inside to care for plants.

I have faith to believe the pineapple will prove a most splendid success in all of Florida and the whole Gulf region of the South to the westward. Enriched soil, warmth, and plenty of moisture and fertilizer will do the work. The experiment is certainly worth of a painstaking trial, as the profits are large, with no danger of overproduction, and the labor dignified and pleasant; and to insure success you have only to guard against danger from cold, and this we all have to do.

The pineapple is propagated from slips, suckers, and crowns —that is to say, shoots from the parent stalk, called suckers, are put close to the ground, and also from base of apple, called slips, as well as from top of apple, called crowns. Another way of propagating is from stools. A stool is a matured pineapple stalk, the roots, leaves, and top cut off—apparently a dry stump—resembling a cabbage stump, only larger. To propagate from them, you bury the stool obliquely in the ground, top protruding. From these stools from ten to twenty offshoots usually appear. To start a pinery, you set out suckers or slips in rows, both ways 18x24 inches, leaving every eighth row vacant for walk and affording room to work them with the scuffle-hoe, pick your fruit, etc. Eight to ten thousand plants are grown on an acre. Several ladies here are quite large owners and managers of pinery interests, one of whom last season cleared $2,000 from a little over half an acre of ground.

Blood and bone, cotton seed meal, mulch, stable litter, cow penning, and many other things are used as food to plants. I am using with splendid results Florida velvet beans ground up, hulls and all mixed with an equal amount of tobacco dust, using the velvet bean hulls for a mulch.

Pines, as a rule, ripen in June and July, but this depends on time of setting out plants, as they ripen in all months of the year. The price of fruit here ranges, as to season, from 40 cents to $1, depending on size and quality. Large fruit dealers, hotels, restaurants, caterers, and private families are our best patrons.

A good revenue is also derived from the sale of suckers and slips, as their increase from the plants are enormous, and are often more profitable than the fruit.

A pineapple possesses rare medicinal properties, and is a sure cure for malaria, diphtheria, dyspepsia, and is a valuable antiseptic.

An ordinary Spanish pineapple will weigh one and half pounds, can and all, while one of ours will fill five or six such cans, and the quality of fruit is not comparable at all. —E. A. W.