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NEW YORK SUGAR MARKET.—The statistical position shows stocks in the United States and Cuba together of 190,956 tons, and 351,228 tons last year—a decrease of 160,272 tons under last year.

Stocks in Europe, 1,169,000 tons, against 1,180,000 tons the previous week, and 1,319,101 tons last year. Total stocks of Europe and America last week, 1,359,956 tons, against 1,670,337 tons last year at the same uneven dates.

The market has ruled firm for raw on the basis last quoted, viz., 4 13-16 for 96 test centrifugal. Refined have again advanced, and are now at the highest price for a long time. Granulated is 6c. Refining is now unusually profitable, with dividend earning power great.

Only once in two and one-half years have the monthly meltings been heavier. Prices have steadily advanced since the settlement of the sugar war, with a greater rise in refined than raw. At present quotations there is a difference of 1.04 cents per 100 pounds between the cost of 96 test centrifugal and the net price of granulated. This means a net profit of \$1.95 per barrel of refined, and is recouping the losses incurred during the fight very rapidly, and insuring good dividends to stockholders in all refineries.

The latest estimate of the sugar crops of the world (1899-1900), as made by Willett & Gray, makes the total production 8,345,944 tons—an increase over 1898-99 of 353,882 tons. The cane sugar production is placed at 2,738,000 tons, the European beet sugar production (Licht) at 5,535,000 tons, and the United States beet sugar production at 72,944 tons.

The sugar planters of Hawaii, through their agents, have renewed the contracts for shipping sugar to the mainland, on the same basis as formerly. Under this arrangement one-third of the crop will be sent to San Francisco, and the remaining two-thirds will go to Eastern ports—New York or Philadelphia. This distribution has worked satisfactorily to all parties concerned. Hawaiian sugars rank among the finest that reach the American refineries, equaled only by the best Javas.

A DISTINGUISHED SCIENTIST FROM LOUISIANA.

The visit here of Prof. W. C. Stubbs of Audubon Park, New Orleans, La., who is connected with the U. S. Department of Agriculture, is an event of special note to sugar planters and others interested in the agricultural prosperity of Hawaii. It is now the purpose of the central government at Washington to take up the work which was begun here by the Sugar Planters' Association, and make it more prominent than it has been, similar to what is being done by the British Government in its West Indian colonies. There is room for expansion throughout our group, but just what form it will take will depend largely on the investigations made by Prof. Stubbs. As he will probably visit every district and plantation in the group, we commend him to planters and others interested in agricultural operations, which are doubtless capable of being largely improved, to include, besides cane and sugar, other staple products, to which little attention has hitherto been paid. In another part of this issue of the Monthly we insert Dr. Stubbs' report of ten years' experimental work in Louisiana. From an interview with the Doctor in New Orleans, published in the *Picayune*, we take the following paragraphs, which show that a number of his old friends and former pupils are now residing here:

"I will say, incidentally, that I shall use the opportunity to study the sugar industry of the islands, which today is possibly leading the world in its acre yields. It will be a most favorable occasion for me to look into the agriculture of the sugar cane and the chemistry and manufacture of sugar. I will not be a stranger in the islands. Besides an acquaintance with many of the planters who have honored me here with visits, I have several former associates of this station and many old pupils of the Audubon Sugar School at work in the station there, or on the various estates, Dr. Maxwell, Prof. Crawley and Mr. Clarke, who were formerly connected with this station, are with the sugar planters' station at Honolulu. Of my old students there, I recall, Shorey, Olding, McQuaide, Pulman, Rodriguez, Collins and Robertson, who are managers and chemists on the different islands. I shall be glad to meet them again, and anticipate much assistance from them in gathering data for my report. * * * Mr. Blouin, who has been with me since his graduation at the Louisiana State University, at Baton Rouge, in 1891, and who is now my assistant at this station, will take Dr. Maxwell's present position in October. Of course, I regret deeply the loss of his valuable services to this station and to Louisiana, but I am glad to know that he is so highly appreciated as to be selected without his knowledge or seeking to such a responsible and lucrative position, for which there were naturally so many aspirants."

ONE OF THE NEW PLANTATIONS.

A recent ride through the Oloa and Puna districts of Hawaii shows rapid changes, which a few years ago would have been deemed impossible. The clearing off of stones, shrubbery and forest trees, which formerly gave the impression that the land was a swampy jungle of little value for farming or cane growing, is a task that cannot be accomplished in a day. Sugar cane will grow in almost any part of Oloa, without irrigation, and apparently with less labor expended on it during growth than in most other districts of Hawaii. The company has already cleared off a large area, some of which has been planted with cane, so that at this date perhaps 2,500 acres are growing, not in one tract, but in irregular fields. Some of this will be used for seed and for replanting, where fields require it. Cane grows here very rapidly and rank—both good qualities in a new plantation, where rapid progress meets many drawbacks. The company has a heavy task before it in putting the land in good shape and condition including roads, which are too often hard to keep in good repair. Still, with a powerful mill, abundance of labor, and the best varieties of cane adapted to the various elevations, which can only be learned by trial, Oloa will eventually prove a bonanza to those interested in it.

AMERICAN ENTERPRISE IN HAWAII.

The Hawaiian Commercial and Sugar Company, formerly known as the Spreckels Plantation, has recently constructed a ditch for conveying water for cane irrigation twenty-five miles along the slopes of Mount Haleakala on East Maui, across numerous ravines and ridges. It is probably the largest engineering work ever done on these islands. The story is best told by one of the party engaged in it, as published in the Pacific Commercial Advertiser of this city.

At the time that the control of the Hawaiian Commercial and Sugar Co. changed hands, an order had been placed with the firm of Fraser & Chalmers to furnish the plantation with four large pumps, each having a capacity of 10,000,000 gallons in twenty-four hours. The idea being to open up some 6,000 acres of fine new cane land lying between the level of the old ditch (180 feet) and upper boundary of the estate, about 475 feet above sea level, to force the water by means of pumps to the higher elevations and allow the old ditch to irrigate the lower lands.

The new management deemed it the wisest plan to reverse the proposition and pump the water on the lower land and dig a new ditch which would bring the water out on the 460 foot level. The reason for this change was that by so doing many

thousands of dollars would be saved to the plantation by reducing the cost of pumping. For five or six months of the year there will be ample water to fill both ditches, in which case the pumps can be shut down entirely, and again whenever there is an extra heavy rainfall in the mountains both ditches will be filled and the water carried to reservoirs, in which event the pumps can be closed down for a time.

The contract for constructing the ditch was let to Carl Jensen, who is well and favorably known in his line of business, having at that time just completed an extensive contract on the Oahu Railroad. Associated with him was H. A. Jaeger, who had just completed a contract for making a section of the Pali road. Work was commenced at once and a force of between four and five hundred laborers were employed.

The ditch is over twenty-four miles in length, starting at Kailua, a point well up in the woods on the rainy side of the Island, and slowly winding its way down, now through thickets of guava or lauhala trees, then along the side of a deep gulch till suddenly it seems to disappear altogether in the side of the hill, only to break out again on the opposite side of the hill. And thus through tunnel, flumes and wrought iron pipe siphons it finds its way to the cane fields below.

One has but to go over the line to realize what an undertaking it is. There are in all some seventy-four tunnels, varying in length from 50 feet to 2,000 feet, and amounting to a total of 30,707 feet, or nearly four miles. The work in some of these tunnels was extremely dangerous on account of the falling slabs of clay and decayed rock from the top of the tunnel, and for that reason it was found necessary to timber. Most of the long tunnels develop water and some are so moist that one gets soaked in passing through.

There are several deep gulches across the line of the ditch, most notable of which are the Halehaku and Maliko gulches. The water is carried over these by means of a wrought iron pipe forty-three inches in diameter which lays almost perpendicular up and down the sides of the gulch. The pipe is in reality a siphon, the opposite end being lower than where the water enters.

The smaller gulches are spanned by means of an immense flume six feet wide by four feet deep. This ditch will cost the plantation in the neighborhood of \$250,000, and will include besides 106,138 feet of ditch proper, 20,707 feet of tunnels, 5,000 feet of 44-inch wrought iron pipe and 2,000 feet of flumes. It will, at its normal capacity, carry to the canefields 60,000,000 gallons of water every twenty-four hours and at an expense which, outside of the interest on the original investment, will be extremely light.

Jensen and Jaeger have both had their hands full owing to the large number of sections of ditch which were being worked

at the same time, and they deserve much credit for the rapid, thorough and workmanlike manner in which they completed the ditch. It is understood that while giving satisfaction, they have been able also to do very well for themselves on the contract.

STREET PAVING.

The necessity of providing some reliable pavement for the central or business streets of Honolulu, becomes more apparent every year. For ordinary roads our volcanic rock, broken up and made compact by the steam crusher, and dressed with fine broken stone or black sand as a top dressing—wears as well as any similar material in cities abroad. But for the central, busy streets, where the heavy traffic of drays, passing to and from the wharves, tears up most roads in a very short time, something firmer is needed.

Prof. Koebele, while in Australia, was surprised in seeing the fine smooth streets that are kept in admirable condition in Sydney and Melbourne. On inquiry he found that they were paved with wood, the eucalyptus having been found by far the best adapted for this purpose, when properly prepared and laid in the manner that experience has proved to be the best. It withstands the heaviest of traffic, and ten years' experience has proved it superior to any material heretofore used for this purpose. It can be obtained in Sydney or Melbourne by the shipload, and is being used there in preference to any other. There are various kinds of hard-wood trees growing in Australia, but experience has shown that some of the eucalyptus varieties are the best for this purpose, lasting for nine or ten years, and showing the annual wear of only 1-16th of an inch of the surface during that time.

We call the attention of the government to the success obtained in Sydney and Melbourne from the use of hardwood pavement, and suggest that inquiries be made regarding the cost of the material referred to, and any further details that may be called for. As the wood requires to be well seasoned, this can be done there, where proper facilities are provided, much better than here.

SUGAR CONSUMPTION.

In a recent article on the consumption of sugar, which appeared in a leading commercial paper, the following statement appears:

“Judging from the occasional appearance in the sugar trade organs of articles eulogistic of sugars as a food staple, there is a strong desire among sugar producers to see the consumption of the article increased in all civilized countries, but except

as a cattle food, sugar would not seem to be amenable to such devices in America or Great Britain, where the aforesaid articles are frequently published. * * * When the continental nations of Europe can allow the home consumer to get his sugar on as favorable terms as the citizen of the United States gets his, there will no longer be any necessity for the formation of syndicates to restrict production, or for the publication of newspaper and magazine articles to stimulate the consumption in new channels."

The demand for sugar is very great and its consumption is steadily increasing; for the past year or two, more rapidly than before. As the condition of the laboring classes of Europe and other countries improves, the use of sugar there, both in food and drinks, will steadily increase. A considerable part of the beets crushed by the factories of Europe is grown by the poorer classes, who cultivate their small patches on rented land, and find this one of the easiest ways to meet their rents and other expenses. The taste for sugar is soon acquired by the small growers, and though the amount consumed may at first be trifling, it increases with time, and the rising generation of all classes will find ways and means to provide it first as a luxury, then as a necessity.

The increase in the European beet sugar crop for 1899 was reported to be 472,000 tons over that of the previous year; Yet the price of sugar in the world's markets has advanced, and is likely to continue advancing, for no other reason than that the consumption is greater than before.

There is no staple product cultivated that is more educating and elevating to those engaged in it than that of sugar beets. The farmers very soon learn that success calls for intensive culture, and that the returns are in proportion to the labor and care bestowed on the beets. Whatever may have been the previous condition of the European beet grower, he in turn develops into a more thrifty and intelligent man. Is it any wonder, then, that he and his family soon acquire a taste for this health-giving food of which formerly they were strangers? Nor is it at all surprising that there should be an increased demand for sweets among other classes, which formerly were not accustomed to it as an article of food.

This demand for sugar and sweets of every kind will increase from year to year—perhaps not faster than the combined production of cane and beets for 1899; still there is room for its expansion in America, which now consumes two millions of pounds annually, drawing more than half of that supply from European and Asiatic sources. The increase in the world's sugar crop for the current year may equal or even exceed what it was last year (470,000 tons) if it keeps up with the increasing demand. The world's sugar crop for 1899 was 8,431,000 tons. If a similar increase is shown for the current

year, the total will not be far from 9,000,000 tons—and all will be needed for increasing consumption of food and drinks. If so, then the average price at present ruling will be maintained. But sugar is easily cultivated, and whether grown by contract or not, finds a ready sale when the fields are located near the factory. In no other way can farmers obtain so good wages with less labor.

LOUISIANA SUGAR CANE IN HAWAII.

Editor Louisiana Planter:—I have just completed the first experiments with the Louisiana canes, the seed of which you sent me from your station, and will give you the results for your information, and for the general interest of the Louisiana planters.

I will first explain that the seed, as received from you, was planted, each piece producing three or four sticks. These sticks were cut at the age of seven months and replanted, again growing until they were seven months old, when seed enough was furnished for my experiments with some to spare. So that the seed sent by you was grown twice before planting for the crop. I consider this advisable practice in introducing any new varieties for testing purposes.

All the varieties—Louisiana, “Tibboo Una,” Louisiana “striped,” and Louisiana “purple”—germinated and were above ground in six days, after which they went right on in splendid shape. The “purple,” however, never showed the same boisterous vigor as the other two varieties.

Coming to the flowering (tasseling) season, at the age of seventeen months the “Tibboo Una” and the “striped” came out in flower ten days ahead of our native or other varieties, and tasseled more abundantly than any others. In fact, these two varieties were the only ones out of thirteen varieties grown side by side that tasseled to any extent. Your varieties grew and matured as though they were actually delighted at having a chance to show what they could do.

The examinations were completed last week with such results as I now give you. Before giving the figures I warn you that certain gentlemen in other countries, when speaking of Hawaiian crops, have said “there is something wrong with the acres on Hawaii,” and I thus wish to explain that in giving these results of yield, I mean so many English pounds per English acre, which statements, I know you will accept:

		Juices Per Cent.	
	Brix	Sucrose in Juice	Purity*
Louisiana striped	18.54	15.95	85.82
Louisiana Tibboo Una	18.21	15.36	84.30
Louisiana purple	17.76	14.90	83.98

YIELD OF CANE AND SUGAR PER ACRE.

	Pounds of Cane Per Acre.	Per Cent. Sucrose in Cane.	Pounds of Sugar Per Acre.
Louisiana striped	239,520	14.35	34,340
Louisiana Tibboo Mird.	241,360	13.82	33,280
Louisiana purple	153,360	13.41	20,540

It is thus shown that the "striped" gave 17.17 short tons of sugar per acre; the "Tibboo Una" 16.64 tons, and the "purple" 10.27 tons per acre. The "striped" and the "Tibboo Una" have beaten all other varieties that were in the competition, the next best being "Demerara, No. 95," after which other local varieties came in.

All the varieties, understand, were grown under strictly identical conditions of soil, cultivation, and fertilization, and the water applied was actually measured throughout the whole course of the experiments. The average length of some selected "striped" canes was 16½ feet of clean cane, with an average of 60½ joints to the cane. You sent me three pounds of each variety and each three pounds has grown into a production of more than 25,000 pounds in this short time.

The more I experience in others and more true cane sugar countries, the more I am in admiration of what Louisiana is doing with such odds of nature against her. But Louisiana has some other special advantages.

Does it not appear to us, though, what is possible in cane sugar growing in tropical countries. When cane sugar gets down to the scientific methods of beet sugar, the beets will be driven out of competition. Hence the future for the cane.

WALTER MAXWELL.

Addendum—I can certify that one small field on one of our best plantations gave 14.84 short tons of marketable sugar per acre. This is as good as my best results; but it was done on vastly better soil.

W. M.

Honolulu, H. I., June 8, 1900.

INCIDENTS AT THE NOMINATING CONVENTION.

[The following report, though a little late, will be read with interest by every American.]

Philadelphia was in gala attire, particularly on Market street, and on Broad street from the City Hall to the Hotel Walton. At night the latter section presented a brilliant sight. The immense City Hall, from the top of the Penn statue to the cornice, was outlined by ropes of electric light, while over each of the four entrances were mammoth coats-of-arms in colored electric lights. The Union League Club was radiant in electric

emblems in colors. The leading newspapers pre-empted the buildings on both sides of the street, had them gorgeously decorated with electric lights, kept open house, and made their enterprise conspicuous by their displays and exhibits. A tally-ho and four was kept going by the New York Journal, which enterprising paper also had a very attractive display of the original drawings of many of Davenport's famous cartoons.

Flags were everywhere. Portraits of McKinley were in public places and the windows of private residences, and the irrepressible badge peddlers everywhere in evidence. Before the nomination of Roosevelt was made they were selling handsome photograph badges of McKinley and Roosevelt on the one badge.

It is an inspiring sight to go into a great building of well-ordered construction and appropriate design and look at 17,000 well-dressed, orderly people, (including those from Hawaii), all the time brimful of expectation and looking for a chance to applaud. Banners, flags, and portraits covered the walls and the galleries and made an inspiring setting for the 930 delegates who cast their votes for William McKinley as nominee for President, and 929 of the 930 who voted for Governor Roosevelt as the nominee for Vice-President.

When the nominations were announced the occupants of 15,300 chairs and the 930 delegates arose, shouted and sang, waved red, white and blue plumes, marched with the signs that designated the State delegations, and competed with the band as it played "There'll be a Hot Time in the Old Town Tonight!" And there sat "Teddy" through it all quiet and self-contained, while the New York delegation, headed by Senator Depew, "whooped it up," and Marcus Hanna, from the center of the platform, swung flags and stimulated the demonstration.

It is amazing how public sentiment will center on one individual and see in him all the qualifications that the people want to find in a popular hero. The convention was heart and soul for "Teddy." The only spontaneous outbursts of applause that had a sound of coming from the heart arose when "Teddy" was brought to attention, except when Senator Depew arose to second his nomination. The greeting of McKinley's nomination seemed perfunctory and lasted about five minutes. It lacked spirit, probably because the convention was simply a registering machine which, in precise and formal manner registered the will of the party leaders. There was none of that Blaine furore which, at the convention which nominated him, broke forth like a flood and then subsided, only to break out over and over again until it wore itself out.

"He is the most popular man today in this country." "Yes, he is all wool and a yard wide." "He is a man of lovely character." "He ought to have been nominated for first place." Such were the remarks that fell upon the ear as we mingled

with the crowd or rode in the street cars. If one heard it once he heard it a thousand times—"Roosevelt ought to be at the head of the ticket."

We do not share in that sentiment, believing that the wider experience, the longer and more satisfying record, the unflinching tact, harmonious relations with members of both houses of Congress, studious care to act in accordance with public desire, undoubted loyalty, patriotism, and devotion to duty of the President make him a safer leader at this time than the younger, more aggressive, enthusiastic Governor who is his associate on the ticket.

As Senator Foraker well said: "No man in all the Nation is so well qualified for this trust as the great leader under whom the work has been so far conducted. He has the head, he has the heart, he has the special knowledge and the special experience that qualify him beyond all others. And, Mr. Chairman, he has also the stainless reputation and character, and has led the blameless life that endears him to his countrymen and gives to him the confidence, the respect, the admiration, the love, and affection of the whole American people. He is an ideal man, representing the highest type of American citizenship, an ideal candidate, and an ideal President. With our banner in his hands it will be carried to triumphant victory in November next."

Governor Roosevelt, in seconding McKinley's nomination, made a notable speech, whether viewed from a Republican or Democratic standpoint. He was right in the statement that "McKinley was the President under whose Administration this country has attained a higher pitch of prosperity at home and honor abroad than ever before in its history, * * * because it has been given to him to personify the cause of honor abroad and prosperity at home; of wise legislation and straightforward administration.

"We all know the old adage about swapping horses while crossing a stream, and the still older adage about letting well enough alone. To change from President McKinley now would not be merely to swap horses; it would be to jump off the horse that had carried us across and wade back into the torrent. And to put him for four years more into the White House means not merely to let well enough alone, but to insist that when we are thriving as never before we shall not be plunged back into the abyss of shame and panic and disaster.

"President McKinley was triumphantly elected on certain distinct pledges, and those pledges have been made more than good. We were then in a condition of industrial paralysis. The capitalist was plunged in ruin and disaster; the wage-worker was on the verge of want; the success of our opponents would have meant not only immense aggravation of the actual physical distress, but also a stain on the Nation's honor

so deep that more than one generation would have to pass before it would be effectually wiped out. We promised that if President McKinley were elected not only should the National honor be kept unstained at home and abroad, but that the mill and the workshop should open, the farmer have a market for his goods, the merchant for his wares, and that the wage-worker should prosper as never before.

"Well, we kept our word. The opportunity has been given, and it has been seized by American energy, thrift, and business enterprise. As a result, we have prospered as never before, and we are now prospering to a degree that would have seemed incredible four years ago, when the cloud of menace to our industrial well-being hung black above the land.

"The war in the Philippines still goes on because the allies in this country of the bloody insurrectionary obligarchy have taught their foolish dupes abroad to believe that if the rebellion is kept alive until next November, Democratic success at the polls here will be followed by the abandonment of the islands—that means the abandonment to savages who would scramble for what we desert, until some powerful civilized nation stepped in to do what we would have shown ourselves unfit to perform. Our success in November means peace in the islands. The success of our political opponents means an indefinite prolongation of misery and bloodshed.

"We stand on the threshold of a new century, a century big with the fate of the great nations of the earth. It rests with us now to decide whether, in the opening years of that century, we shall march forward to fresh triumphs, or whether, at the outset, we shall deliberately cripple ourselves.

"Our Nation, glorious in youth and strength, looks into the future with fearless and eager eyes, and rejoices as a strong man to run a race. We do not stand in craven mood, asking to be spared the task, cringing as we gaze on the contest. No, we challenge the proud privilege of doing the work that Providence allots us, and we face the coming years high of heart and resolute of faith that to our people is given the right to win such honor and renown as has never yet been granted to the peoples of mankind."—American Grocer.

WOOD PAVEMENT FOR HONOLULU STREETS.

Our public roads throughout the group have been gradually improved from year to year and where the traffic over them has not been too heavy, they are kept in fair condition without much outlay. The lava stone, so abundant here, makes a solid and lasting foundation, when properly laid and well packed, while the black volcanic sand, as it is called, serves admirably for a top dressing. For light traffic this makes an excellent road, although liable to washouts, as any road is. Most of the

roads in and around Honolulu are made of this material, although coral or lime rock is used to some extent. Heavy traffic, however, such as much of the draying in and around Honolulu consists of, calls for something more durable.

In some of the large cities on the mainland wooden pavements are now used, some of which do good service, while others are very poor, and last only three or four years. The durability of these pavements depends on the kind of wood used, and the manner in which the blocks are prepared. If the wood is not suited for this service, no skill in laying the blocks can make them last long for road wear.

When Prof. Koebele was in Australia, he was much impressed with the fine, smooth roads in the down-town or business sections of both Sydney and Melbourne, where heavy draying is carried on, particularly along the city front. These streets are paved with eucalyptus blocks, and some of them have stood the heavy traffic over them for eight, nine and ten years, requiring only slight occasional repairs. With this fine timber to serve as the foundation, when properly prepared and looked after, they make the best if not the cheapest road for the city traffic that can be found, considering length of service.

Our object now is simply to call the attention of the Government to these facts, in order to make inquiries regarding the cost of preparing the material so as to deliver it "ready made" so to speak, for use on arrival here. With the large traffic now carried on between Australia and Honolulu, freight of this kind ought to be brought here at a reasonable cost, the material being the best of its class in the world. Experience has shown that the Australian hardwoods are the most durable, and consequently the cheapest in the long run. Give the eucalyptus a fair trial for street pavement.

GERMANY'S SUGAR OUTLOOK.

The upward tendency of Germany's sugar markets and prices still continues, and the districts that have held industry meetings of late, have all noted these facts with consummated satisfaction. One unexpected factor has aided this result. Cuba, which early in the year was computed to produce 440,000 tons, and which was recently reputed to be able to export 345,000 tons of sugar, now reports but 335,000 tons available, with a probability of even smaller figures. There is no longer a shadow of doubt that Cuba's sugar production will not equal that of last year, and Porto Rico reports equally unfavorable conditions for the sugar product of that island.

These things all contribute to the happy expectations of the beet sugar growers and manufacturers of the Fatherland, and the reports of increased acreage, due entirely to these recent

developments, but go to show that Germany will make the most of her sugar raising capabilities this year. The usual early sales of the German beet product are not as numerous as heretofore, in fact, efforts are making themselves felt all over the beet growing districts to do away with the practice entirely. America's low prices offered for export sugar have not shaken the confidence of the sugar holders, who are calmly awaiting the time when the present stock available in America will be exhausted, and the Yankee buyers must go to European markets for new goods. This demand from American sources they compute will be felt at present advanced prices, and every stock transaction bespeaks the confidence all feel in the future. Germany's information regarding the condition of the sugar crop in Cuba is borne out by Gen. Emilio Nunez, Civil Governor of Havana.—Berlin Corr.

DEEP WELLS—TWO RECORD BREAKERS.

J. J. Diehl, of Shell Beach, eight miles west of town, has two record beating deep wells. The News had already given some information about the wonderful twins. Having had occasion to interview Mr. Diehl lately, we are now enabled to give more details: They are 8-inch wells, one 142 feet deep and the other only 137, 20 feet apart, and both tap the same flowing stream below, for they each overflow 3 feet. Without pumping they would probably water 40 acres, and by pumping will, no doubt, furnish enough water for 250 acres. A centrifugal pump is being attached. Messrs. Barber & Hanson, of Jennings, sank the wells. The total cost did not exceed \$1,200—pumping outfit complete, including a 15 h. p. traction engine to be used also for threshing will foot up about \$1,500.

TRUCK GARDENING PAYS.—A colored man residing at Crystal Springs, Miss., sold \$225 worth of tomatoes from one acre of rented land, and after the tomatoes were gathered, took \$25 worth of corn off the same acre of land. This was done last year and is reliable information. It only goes to show the profits of truck gardening.—Ex.

THE UPSIDE-DOWN HOUSE AT THE PARIS FAIR.

“The strangest thing in the Paris Exposition Midway is the ‘upside-down house,’ ” said a guest at one of the hotels, who has just returned after a visit to the other side of the pond. “Nobody but a Frenchman would ever have thought of such a thing. It is a big, old-fashioned three-story manor house, apparently resting on its gables, with the foundation eighty feet in the air. One goes in through a dormer window in the attic, and finds everything upside down. Underfoot are what

appear to be the ceilings, spouting chandeliers like giant toadstools, and overhead are chairs and tables and all the other ordinary furniture of a house miraculously clinging to the reversed floors. There are even books and small articles scattered about on the carpets, and sticking to them as if by magic and on some of the tables lamps are burning, top down.

Everything about the place contributes to one of the most bewildering illusions imaginable, but the really amazing feature of the house is the view through the windows. They command a considerable expanse of the exposition grounds, and, incredible as it may seem, everything is upside down. One sees all the familiar buildings standing on their heads, throngs of reversed people walking to and fro, and the sky yawning where the earth ought to be. The effect is indescribably startling. I puzzled over those windows for a long time, but I finally discovered their secret. The illusion is produced by means of two mirrors, both set at angles in the casing and one reflecting the other. By that means the outside scene is turned about topsy-turvy and cast back into the room with all the realism of an open-air view. Visitors are not allowed to go very close to the windows for fear, as the attendants say, that they will 'fall down into the sky.' A man should be perfectly sober before he inspects the 'upside-down house.'—New Orleans Times-Democrat.

DR. STUBB'S WORK AT AUDUBON.

Ten years have elapsed since the occupancy of a part of Audubon Park as a experiment station. The elaborate series of experiments then begun have been continued without intermission upon the same plots. These experiments looked to a solution of the proper fertilization of cane, the varieties best suited to our environments, and to physical and physiological questions involved in practical cane growing in Louisiana. Later on the proper cultivation of the cane claimed attention, and numerous experiments have been conducted looking to more light on this important subject.

Every question involved in the successful and economical growing of sugar cane has been investigated in the field and laboratory, and it is proposed to give the summary of the ten years' work. In a well equipped sugar house and laboratory nearly every question pertaining to the chemistry and manufacture of sugar has also been studied, and the data accumulated will make a large bulletin, which will be given later.

In this will be given the preparation of the soil, the kind and quantity of cane to plant, the proper fertilization and the rational mode of cultivation.

PREPARATION OF THE SOIL.—Most of the soils of the sugar belt of Louisiana are strongly silty and clayey, and though we

denominate them as "sandy," "mixed" and "black," there are very few, if any, that can properly be called sandy. They vary from loamy silts through silty clays to almost pure clays. They have great capacity for holding water, and this property, added to the almost level topography of this section, makes good drainage of paramount importance. In fact, it is the sine qua non of growing good crops, and but few planters properly appreciate its importance. Badly drained lands cannot be made to yield large crops. Much of the failure of fertilizers and cultivation is ascribable directly to defective drainage. Samples of soil taken from spots said to be barren, have, in numerous instances, been sent to the laboratory of the station for examination. Analyses showed them to be rich in all the elements of plant food, even in nitrogen producing humus, while physical investigations clearly indicated that their defects were due solely to lack of drainage. The discordant opinions, based upon results in the field as to the efficacy of certain fertilizers, may be largely explained by the difference in drainage of and upon separate plantations. The experience of this station would emphasize the impossibility of overdrainage, provided the proper plan has been intelligently followed.

In no instance has the writer seen a system of ditches deep enough, wide enough, and sufficiently numerous to carry off our heaviest rainfalls, without temporarily flooding some portion of the soil or elevating the bottom water to a point uncomfortably close to the roots of the growing plants, and thus destroying the tilth which previous heavy labor had established. Open ditches should be numerous, deep and wide, and not over 100 feet apart, wide enough to carry off the floods, and deep enough to hold the bottom or ground water at least three feet below the surface.

TILE DRAINAGE.—Dispenses with the annual expense and attention required by open ditches, recovers and devotes to cultivation the large areas now occupied by open drains, proffers no harbor to insects, and permits of cross-plowing the land in preparation for crops. Its chief objection elsewhere is its great first cost. In Louisiana, judging from the experience of the station, there is another and more serious objection. They are too short lived to be profitable.

Tiles laid with the utmost care upon this station are nearly filled with silt and are not performing the work expected of them. It seems impossible, after one of our heavy rainfalls, to prevent an accumulation of water in the canal into which the tiles empty, thus covering the exits and backing the water up into the tiles, checking its outward flow and causing it to deposit its very fine silt in the tiles. This is greatly to be regretted, because the superiority of tile drains, over open ditches, is pronounced in every operation of the farm, from the flushing of the soil to the laying by of the crop.

It is confidently expected that some method will yet be found by which the water entering the tile can be deprived of its silt, and the outlet of our tiles into canals can be exempted from submergence in times of heavy rains. If so, tile drainage will ultimately be as popular in South Louisiana as it is now in Illinois since the decreased cost in preparation and cultivation, the increased area of land and enhanced acre production, the absence of expense incident to clearing and cleaning open ditches, will more than repay the interest upon the cost of tile drains and leave annually a surplus which in a few years will liquidate the principal used in their construction.

Our experiments have shown uniformly increased tonnage upon tiled lands, and it is with great regret that we witness the gradual elimination of these increments to crop production, as the tiles fill with sediment.

In addition to thorough drainage with ditches and canals, our rows should be so constructed as to furnish a small drainage channel between them. The constitution of our soils and the level character of our land require artificial drainage to insure warmth and necessary condition for bacterial growth. Nature must be imitated in a small way. Just as the mountain chain precipitates the water falling upon it to the plains below, where it is sent in numerous channels to the sea, so in our fields, our rows must be elevated into miniature mountain chains, which must shed their excessive moisture to the middles, which in turn convey them to the quarter drains, where they are carried to the ditches and canals. Hence ridging the rows is a custom universally followed and flat culture everywhere recognized as unsuccessful. How high these ridges should be is not definitely determined, but every planter strives to make the height as great as his plows will construct.

PLOWING.—The natural tendency of all soils, when undisturbed, is toward rock formation. This is evidenced by the hard-pan, often impermeable, found beneath some soils. This is peculiarly true throughout the rice lands of Southwest Louisiana, where this impermeable subsoil acts as a basin to hold the water fallen or placed by irrigation upon the soil, in flooding rice. The breaking plow is designed to check this natural tendency, and where a hard-pan subsoil already exists, and is beyond the reach of the turn plow, the subsoil is frequently used to destroy it. Plowing destroys weeds and grasses, cleans the soil of its foulness, and prepares it for the growth and sustenance of the crops to be grown.

Turn plows are used to incorporate the vegetable matter growing on the surface with the soil, so as to ultimately produce humus, which physically plays so important a role in all cultivated soils and chemically furnishes nitrogen, the most costly and valuable ingredient of plant food.

Land is broken to control moisture. It is thrown up into

high ridges to relieve excessive moisture and prevent an accumulation during rainy seasons. This custom prevails in all the bottom lands of countries where heavy rainfalls occur.

Open, porous soils, or all soils in a comparatively dry country, are plowed flat to catch and hold the winter's rain for the use of the following summer's crops.

Plowing should therefore be varied according to the nature of the soil and the conditions of the climate, and here as elsewhere in farming, excellent judgment is required to determine how and why it should be done. Whatever may be the "how and why" of breaking land, if properly done at the right time, planting and cultivation become simple processes. Tilth is obtained, and all subsequent operations are directed with a view to maintenance of tilth. Unfortunately plowing is not always done properly or at the right time. Haste, over-cropping, bad weather, carelessness, and sometimes ignorance, cause us to throw furrows hastily together, plant seed in clods, surrounded by shallow and foul ditches, with few and imperfect quarter drains. Poor stands are obtained, which neither fertilizers nor after cultivation can force into large yields. The cane is laid by before tilth is obtained. This condition prevails largely in the cultivation of corn in South Louisiana, and, while the corn crop is never what it ought to be, the tilth finally secured by cultivation, while of but little use to the corn, serves to make an abundant crop of pea-vines from the peas sown at the last working corn.

PLAN OF PREPARATION.—The triennial rotation of cane, corn and cow peas, prevailing generally in Louisiana, requires that the pea vines, after the corn is gathered, shall be turned under with large four to eight horse plows. Usually the land is thrown at once into rows five to seven feet wide; the middles are broken out with double mould board plows, and quarter drains cleaned to the depth of six inches below the middles of the rows.

The station has found that by flushing the land first, then bedding into rows, more satisfactory results are obtained. The increased cost involved is more than compensated by the enhanced yield of crops, due to better preparation. There is danger in this climate—the only objection to this method—of getting your flushed land caught flat, in heavy rainfalls, and if so, time will be required after ridging it for the securing of tilth. The modern disc plow is admirably adapted to flushing lands, turning under very successfully and rapidly the heaviest crop of pea vines. Indeed, with it so much more land with pea vines on it can be turned over in a day than with the turning plows, that it is doubtful whether the two operations of flushing with the disc and bedding with two horse plow, be more expensive than ridging at the one with large turning plows, constantly choking with the accumulation of vines.

PLANTING CANE.—The ridges of the rows are opened with the double mould board plow, and two continuous canes deposited in the furrow and covered with the disc cultivator. Hoes follow to insure perfect covering. The middles are plowed out with the double mould board plow, the quarter drains are opened, and the operation of planting is completed.

VARIETIES OF CANE.—Since the inauguration of this station, foreign varieties of canes from nearly every sugar country on the globe have been imported. Over one hundred so-called varieties have thus been tried, with results not at all satisfactory. Cane requires a long time and considerable labor in this country to acclimate it. The inherited tropical tendencies, entirely unfit for our short seasons, are very slowly eliminated by constant cultivation. There is a slow but gradual change in nearly every variety by each year's cultivation, and a few give hope of ultimate success.

SEEDLINGS.—But the acclimation of old foreign varieties is entirely superseded by the introduction of seedlings. Through the kindness of Prof. Harrison of Demerara, Prof. Fawcett of Trinidad, and Prof. Bovell of Barbadoes, the station has received all of the prominent seedlings grown on these islands. In all, over fifty varieties have been received and tested. Only three of these are worthy, so far, of cultivation. These are Nos. "69," "74," and "95." No. 74 is pre-eminently attractive, giving a heavy tonnage, high extraction, and large sugar content. It is a dull green cane with long joints, growing very tall and straight. It has been tested for five years on this station with uniformly good results. It gave last year (1899) thirty-eight tons per acre in the field, which yielded 81 per cent. extraction with saturation, upon our nine-roller mill at the sugar house, and its juice contained about 16 per cent. sugar.

So full of promise is this cane that it was sent in 1898 and 1899 to every planter applying for it. Over two hundred bundles were thus sent out each year.

Nos. 69 and 85, while quite promising, are not up to 74 in all round merits. These, too, have been sent out in limited quantities for trial.

Which is the best cane for seed: Plant, or first or second year stubble? What part of the cane is best for seed: "Top," "middle" or "butt?" Does the size of the cane affect its progeny? Tested by planting "large," "medium," and "small" canes.

Best cane for seed. Plant, first stubble or second stubble? Experiments begun in 1886 have been continued ever since without intermission. The results up to 1890 have been given. A summary of the last ten years will be here recorded. In 1886 selected stalks of plant cane, first year stubbles and second year stubbles were planted. The next year selected stalks

from the "plant from plant" of the first year's experiment and from the fields of first and second year stubbles were again planted. The third year selected stalks from the "plant from the "plant from plant" of third year's experiment, from "first year stubble from first year stubble" of the first year's experiment, and from the field of the second year stubble were planted. The fourth year gave us for seed selected stalks from the "plant from plant" of third year's experiment, from "first year stubble from first year stubble" of second year's experiment, and from "second year stubble from second year stubble" of first year's experiments.

On moving from Kenner to this place in 1890, there was of course only plant; therefore in 1891 only plant cane was obtainable for seed, but this was pedigreed from 1886. In 1892 seed from first year stubble was available, but it was originally from plant. In 1893 seed from second year stubble was available, and it was originally from plant. Therefore in 1894 our systematic experiments were begun and have continued up to the present, involving three plots each year, one of plant, one of first year stubble, and the third of second year stubble. While all have descended from a common parentage in 1886, they have done so, however, on very different generations. Starting with 1894, the plant cane is now in its sixth generation. The first year stubble has now completed its second generation, but through two lines, while the second year stubble has only completed one generation of only one of its three lines. In our experiments, therefore, we have two lines of ancestors from first year stubble, and these lines from second year stubble, all traceable ultimately back to a common parent in the plant cane brought from Kenner. But the rate of descent in the plant is twice as fast as in the second year stubble. Hence at the end of six years we have the plant sixth in descent, the first stubble third in descent, and second stubble second in descent from cane planted in 1894. It is inferable from the above that to acclimate a cane it should be planted from the plant every year, if indeed it may be assumed that the stubbles are part of the original plant, which, however, from the nature of growths, seems problematical.

Experiments have been made extending from 1894 up to the present, carrying each planting, made yearly, into second year stubble, except the planting of 1897, which the cold of 1899 destroyed (the second stubble), for determining the best seed for planting: plant, first stubble or second stubble.

The purple plant leads slightly in sugar content, while first stubble striped, leads in tonnage. Taken separately the purple plant leads both its first and second stubble, while both of the striped stubbles lead in striped plant.

How far these differences are due to local environments and not inherent in the cane, it is difficult to answer. In every

instance the same relative positions in the plat have been maintained, the purple plant occupying the extreme right next to headland.

Taken collectively, the first stubble leads in tonnage, followed by second stubble. The above is an average of many experiments extending over six years, and while not positive in its conclusions, it is reasonable, we think, to draw the inference that good stubble cane is fully equal, if not the superior, of plant cane for seed.

What part of the cane shall we use for seed?—Mindful of the great draft upon the sugar industry of this State, by the large amount of cane used every year for seed—estimated at one-sixth of each year's crop—and realizing the necessity of adopting every method looking to a more economical production of sugar, the station has sought to determine in the field, laboratory and sugar house, the feasibility of planting the tops of the cane, instead of the entire cane, as is now the universal practice.

Work along this line began in the last decade, and has continued uninterruptedly up to the present. Careful comparative experiments have been made by planting the "butts" (the lower third), "middles" (the middle third) and "tops" (the upper third) separately, using both varieties of our home canes, purple and striped. Reports of the field and laboratory up to 1894 have been made in past bulletins. A special laboratory investigation to determine, by analysis, whether the cane grown continuously from "tops" had degenerated, was made on this station by Dr. Beeson in 1895 and published in Bulletin No. 38. No sign of degeneracy could be established by chemical analysis.

Continuous plantings every year have been made, using "tops from tops," "middles from middles," and "butts from butts." So that the cane harvested in 1899 was the thirteenth in descent from "tops," "middles," and "butts."

An inspection shows that taking the vicissitudes of seasons and the somewhat precarious conditions of stubble, especially when carried into the second year, that results show but little difference from plantings of the different parts of the stalk. While purple "tops from tops" are slightly behind in tonnage, the striped "tops from tops" lead the experiments, and the average of the two yields, slightly higher results than from the other two portions. The average of the two canes from each "tops," "middles" and "butts" are so nearly identical as to dispel any preconceived prejudice or preference for any portion of the stalk as seed. These experiments cover three plats of three years' continuous growth—plant, first stubble, and second stubble; one plant of two years' duration (1897 and 1898), plant and first stubble (the second stubble; destroyed by the cold of 1899), and one plat of two years' duration,

started with plant in 1898 and carried into first year stubble in 1899, but with vigor greatly reduced by the freeze, and one plat of plant in 1899, still under cultivation. The above is, therefore, the aggregate of fourteen field experiments, covering six of plant, five of first stubble and three of second stubble.

The results are certainly assuring of the value of the upper third of the cane for seed, and since this part has little or no sugar value in the sugar house, but serves rather to increase our molasses output, it would be a great saving both in money and labor, could some practical way be found by which the upper thirds of our entire crop could be used for seed and the lower two-thirds be sent to the sugar house. The sugar output, both per ton of cane and per acre, would be greatly increased, the cost of manufacture decreased, and the large part of our cane crop now reserved for seed, constituting so large a part of the cost of planting cane (four to six tons per acre at \$3 to \$5 per ton) could be annually worked into sugar, giving an increased revenue to the planter. Many planters are already trying the planting of "tops," and it is hoped that some practical method may be suggested by which every planter in the State may ultimately save his tops for seed while harvesting his crop for the mill.

CONTINUOUS PLANTING OF DIFFERENT SIZES OF CANE.—The question is often asked, whether as good results can be obtained from the planting of canes of all sizes as from stalks selected entirely on account of their size.

In other words, what are the comparative results of continuous planting of large, medium and small stalks?

In 1894 the largest stalks that could be selected from the general crop were used to plant a plat. Stalks of medium size and of the smallest dimensions were almost simultaneously selected, and each planted separately in adjoining plats. From these three plats were selected, the next year, the "largest" stalks from the "largest" plat, "medium" sized stalks from the "medium" plat, and the "smallest" canes obtainable from the "smallest" plat, and each planted again on adjoining plats. This has been repeated six times since, and each planting carried into first and second year stubble. Thus fourteen results have been obtained up to date.

An examination shows conclusively the diminished yields occasioned by the use of small, inferior stalks for seed. This is quite apparent every year in the plant cane, where decreased tonnage is visible to the eye. It is not perceptible to the eye in either the first or second year stubble, and is revealed only by the scales.

The difference between the results from "large" and "medium" canes is not strikingly marked, but it is believed that a continuation of these experiments, which it is contemplated to

do, will show here as elsewhere that "like produces like," and it will be profitable to plant strong and vigorous canes for seed.

THE SUGAR REFINING INDUSTRY.

It has been evident for some time that movements were under way which would lead to a termination of the sugar war, or a truce which would amount to practically the same thing. The American Grocer of September 20, 1899, said:

Judging from the course of events, it is apparent that the Trust is being conducted on the theory that the elimination of the Doscher refinery is best for its interests and that of the jobbers. When that is accomplished, we may reasonably expect a termination of the war—a working plan between the other refineries and the Trust that will mean a continuation of 12 per cent. dividends on sugar stock and a profit to jobbers; cheap sugar to consumers, whose greatest prosperity lies in having all American industries on a profit-earning basis.

On Thursday last the Doscher refinery became a part of a new corporation organized under the laws of New Jersey, entitled the National Sugar Refining Company, and is authorized to deal in sugar and coffee. The following are the directors: James H. Post, Frederick D. Mollenhauer, Herbert D. Corey, Claus Doscher, George R. Bunker, Frederick H. Howell, and Henry F. Mollenhauer. Mr. Post was elected president, F. D. Mollenhauer vice-president, and Mr. Corey secretary. The new company also absorbs the Mollenhauer and the National refinery, the three houses having a daily capacity of about 8,500 barrels.

The refineries of the American Sugar Refining Company have a capacity of about 40,000 barrels per day, and last year melted 1,260,248 tons, or 67.2 per cent. of the total meltings of all refineries.

The Arbuckle refinery has a capacity of 3,500 barrels daily, and is to be enlarged to produce 5,000 barrels daily.

This latest phase of the sugar war must be regarded as victory for the American Sugar Refining Company, and at least a partial vindication of President Havenmeyer's policy, which all along has had the support of a large majority of the stockholders of the American Sugar Refining Company.

What the outcome of the new combination will be is largely conjecture. Presumably, there will be a working agreement between the American Sugar Refining Company and the independent refineries whereby the industry will be maintained on a profitable and dividend-paying basis. At present the difference between 96 degrees test centrifugals and granulated is 77 cents per hundred pounds, affording a net profit of 27 to 33 cents, or sufficient to pay liberal dividends on the preferred and common stock of the American Sugar Refining Company,

and thus continuing it as one of the best investments known to Wall street. If there is a further advance in refined without a corresponding rise in raw sugar, profits will be larger and regular dividends insured.

There are now in the field as competitors the American Sugar Refining Company, the Arbuckle refinery, the National Sugar Refining Company, the McCahan refinery at Philadelphia, the Boston refinery of Nash & Spaulding, and refineries at New Orleans, San Francisco, and in Texas, besides the beet sugar plants. There is, therefore, no danger of a monopoly in the sugar trade, for the interests involved in combining the units are too great and diversified to give promise that a combination could be formed which would work smoothly and profitably, and which would be free from political influences and attacks.

And if such a combination were formed and paid large dividends, it would surely provoke fresh competition.—American Grocer.

During the last campaign at the Bernstadt factory, (German), there were worked 37,590 tons of beets from which were extracted 5,150 tons of first grade sugar or 13.7% of the beets worked; the extraction in sugar of all grades was 14.8%. To produce one ton of sugar there were sliced 6.7 tons of beets. The profits were \$55,310.

A writer in *Deutsche Zucker Industrie* suggests that England will probably impose an import duty on sugar to help defray the expenses of the Boer war, and thereby promote beet sugar manufacturing at home. He thinks Ireland would be a favorable country for beet sugar with its "low, flat land and cheap labor."

COMPTROLLER COLER ON TRUSTS.

In a letter to United States Senator J. K. Jones, Comptroller Coler, of New York, advocates a State control of corporations. In a word, he would secure publicity of the affairs of corporations, and prevent their overcapitalization. He says:

"Business that requires secrecy of management and manipulation of securities is not entitled to the protection of the State, and should be refused corporate powers. No corporation should be allowed to issue securities except for actual value, and these should not be placed upon the public market until the end of at least of one actual business year, and then only after public reports by certified accountants under employment of the State and bearing its seal.

"Places of business and location of factories should be named at time of incorporation, and no removal of same should

be allowed without consent of the State. This is to prevent the destruction of communities, and for the protection of employees who have invested their savings in homes contingent to factories, and in many cases upon the recommendation of employers. From its beginning the accounts of every corporation obtaining a charter privilege from a State government should be open at all times to examination and regulation by properly appointed public officers.

"The light of publicity will prove the best safeguard against extortion, and render impossible such financial brigandage as was lately witnessed in New York City in the case of the Third Avenue Railroad and the Ice Trust, and throughout the country in the case of the American Malting Company, the United States Milling Company, and others.

"It may be well to revert to the times of the fathers who framed our constitution, and who, to prevent what they regarded as a threatening evil, abolished mortmain and primogeniture. They were guided by experience and the lessons of history in declaring that the unlimited accretions of property in the hands of one man or family in perpetuity was inconsistent with a democratic system of government."

Judge Hazen, a brother of Mrs. Dewey's first husband, is quoted as saying that if the people of this country do not desire to place the destiny of a nation in the hands of a woman it will be best to let the Admiral remain where he is. Doubtless Mrs. Dewey is a bright, capable woman, and quite familiar with public affairs in Washington, but it would be decidedly ungenerous and unjust to imply that Admiral Dewey would be ruled by his wife. And yet we do not know why a woman cannot be a good adviser, nor why the boudoir may not supply as good a cabinet as the "kitchen."

EXPORTS OF AGRICULTURAL PRODUCTS.

During the five years ending June 30, 1899, the exports of domestic products averaged \$1,020,564,765 annually, of which \$694,874,000, or 68.09 per cent., were agricultural. Over 20 per cent. of the agricultural articles exported were the products of animals. The exports of hog products last year reached 1,678,265,645 pounds, valued at \$115,179,343. The trade in oleomargarine with foreign countries has averaged \$8,394,729 for the past five years.

Last year over \$12,000,000 worth of cottonseed oil was exported, besides \$565,292 worth of corn oil. In addition to exports in 1899 of \$13,809,335 worth of vegetable oils, there were exports of \$14,548,765 worth of oilcake and oilcake meal—a pretty good record, when we consider that thirty years ago neither item figured in the list of exports.

The export trade in fruits has grown from \$4,856,517 in 1895 to \$7,757,235 in 1899, and has averaged \$8,074,204 for the past three years.

The exports of breadstuffs have been unusually heavy during the past five years, as the following will show: 1895, \$114,604,780; 1896, \$141,356,993; 1897, \$197,857,219; 1898, \$333,897,119; 1899, \$273,999,699; total, \$1,061,715,810; yearly average, \$212,343,162.

In a statement on the foreign commerce of the United States, written by Thomas Jefferson in 1792, he notes that the exports of breadstuffs amounted to \$7,649,889. He also notes that during 1793 the port of Philadelphia exported 422,075 barrels of flour. In little over a century the exports have grown from nearly \$8,000,000 to an average of over \$212,000,000 annually. This is a growth that speaks volumes to the credit of the American farmer.

Tobacco figures in the exports to the extent of \$25,467,218 in 1899, and averages nearly the same for the past five years.

The above record is calculated to stimulate pride of country, and emphasizes the importance of a wise foreign policy, uniform and stable, and from the dictation of party politicians wedded to whatever policy seems to be potent at the moment to win popular favor.

It now becomes evident that it is going to take some time for Cuba to recuperate from the disastrous effects of the war. The destruction of the sugar houses, the neglect of the cane fields, and the disorganization of the labor system will certainly require some years before even the anti-bellum annual production of a million tons can be reached; and the injurious results to Louisiana which will almost surely follow a very large production in Cuba we must now relegate to a period some years hence.—Ex.

LOUISIANA SUGAR HOUSES.

An interesting historical review of the sugar industry of Louisiana has been contributed to the Louisiana Planter by W. C. Stubbs, Ph. D., from which we have taken the following:

From De Bore's crop of sugar (fetching \$12,000—a large amount in those days) in 1795, to the prospective crop of the present year of about 400,000 tons, requiring at least \$35,000,000 to move it, there is an interval of three generations of time and a difference in value of almost infinity. His crop was made upon his plantation, then six miles above the city (now Audubon Park, well within urban limits). The present crop of the State extends from the lakes on the east to the Vermillion River on the west, and from Alexandria on the north to the gulf shore on the south.

De Bore crushed his canes one by one with a horse mill, and 600 acres will be tributary to our sugar houses.

De Bore crushed his canes one by one with a horse mill, and evaporated the juices in a kettle over an open fire. Today most of the canes are crushed with ponderous six and nine-roller mills, calling for a million of canes for their daily work, and the streams of juice coming therefrom are quickly concentrated in vacuo into massecuite, which by turbinage yields the golden and snowy crystals of commerce.

The purgery into which De Bore's sugar had to be grained, potted, and drained, has been supplanted by the hot room, and this in turn is destined to be displaced by "crystallization in motion." The horse was, as early as 1822, superseded by the steam engine, and the latter has been growing and expanding ever since, till today a battery of water-tube boilers, fired with the refuse of the cane, are found in every well-equipped estate.

Could this brave pioneer in the sugar industry of Louisiana revisit this mundane sphere he would fail to recognize any semblance of the present industry, either in the field or sugar house, to the one he inaugurated in 1795. He cultivated the Creole or Malabar variety of cane, now rarely seen and hardly known in Louisiana, while the purple or striped canes are in evidence today on nearly every plantation. The wooden mold-board plow with which he turned the tenacious soil of Audubon Park is to be found only in a public museum and valued as a precious relic of a prosperous past.

The introduction of the steam engine as a propelling power of the sugar mill by Mr. John J. Coiron, in 1822, marks the beginning of another epoch in the sugar industry, even though delayed for several years by the extravagant price of the imported mills and engines.

The introduction of the vacuum pan by Mr. T. A. Morgan upon his Orange Grove plantation, below the city, in 1830, created almost as much excitement among the planters as De Bore's experiments in 1795, and the results were watched with an intense interest.

Coal was first used as fuel in the sugar house in 1840, and the centrifugal was introduced in 1852. About the same time bagasse burners were first adopted.

Mr. La Piec, in 1846, had a "double-pressure mill" which "extracts nearly all the juice from the cane and fits the bagasse in the best possible manner for manure, which is fit for immediate use."

There are over 300,000 acres of land at present in cane in lower Louisiana, requiring over 30,000 mules in its cultivation. It is grown chiefly by the proprietors of large estates, with hired labor working in gangs, superintended by managers and overseers. A considerable quantity of cane is also grown by smaller planters and farmers for sale to the large factories.

Most of this cane is transferred to the large factories by the various lines of railroads permeating the sugar section.

The quantity of cane grown by farmers and planters is restricted by the absence of nearby factories to work up their crops. Could these factories be built, particularly on the confines of the cotton and sugar belts, the area devoted to cane would annually increase.

While the number of sugar houses has been greatly diminished, the aggregate capacity is rapidly increasing. There were once over 1,500 sugar houses in Louisiana. Today there are not over 400, and of these not over 200 are of the modern type in style and capacity. These sugar houses are required to handle (probably) this year over 6,000,000 tons of cane within the short time of ninety days. Formerly a sugar house with a capacity of 200 tons of cane per day was regarded as a model plant of high excellence. Today many of our sugar houses crush from 1,000 to 1,600 tons per day, and whisper of probably larger results in the near future.

With each enlargement, other things being equal, the cost of manufacturing sugar per pound diminishes. The question of cheaply handling the cane and placing it upon the carrier at the sugar house has been largely solved by the several devices recently patented, thus dispensing with the enormous cost formerly incurred by putting the cane on the carrier by hand labor.

Six and nine-roller mills of huge dimensions, with supplementary crushers or shredders, are in evidence in nearly every large sugar house. "Superheating clarifiers" of several patents are found in many houses. "Double," "triple," and "multiple" effects of several makes evaporate the clarified juices. Filter presses, both for the scums and settlings, and the juice and syrup, abound in almost every sugar house. Vacuum strike pans of enormous capacity are required for graining the sugar, while a half-score or more of centrifugals are used to separate the crystals. Hot rooms, filled with wagons of second and third sugars, are found in nearly all of our factories, being supplemented in a few by "crystallization in motion." Batteries of water-tube boilers, with bagasse burners, furnish the steam to move the ponderous engines which turn the mills and centrifugals, run the numerous pumps and evaporate the water from the juices.

A mammoth establishment is a first-class large sugar factory, and hundreds of thousands of dollars may be invested therein. The clientele of a modern, up-to-date sugar house is made up of intelligent and industrious experts, and sugar-makers, chemists, clarifiers, effect men, centrifugal men, clerks, etc., must all be men of intelligence, experience, and probity.

The amount of cane coming to such a sugar house and the quantity of sugar going out of it are too large to be realized

without close study or experience. Nearly every estate has its private railroad running from its sugar house through its fields, over which hundreds of cars loaded with cane are daily transported. Tracks from the public railroad traversing the estate are frequently laid on both sides of the cane carrier, so as to receive and discharge the cars coming from other plantations.

The best mills extract from 80 to 84 per cent. of the total 90 per cent. of juice in the canes, and obtain as dry sugar 90 to 95 per cent. of the total sugar in the juice.

In many of the sugar houses such excellent work is performed that human ingenuity is heavily taxed to suggest improvements.

The manufacturing side of the industry, as represented in the best factories, is fully abreast, if not ahead, of that done in any other country on the globe.

Such is the present condition of the sugar industry in Louisiana.

CALIFORNIA AND FLORIDA.

We do not intend to institute an invidious comparison between these two States, says the Florida Agriculturist, but simply to give a few reasons why Florida should be preferred by those wishing to settle in a semi-tropical country either for health or for the pursuit of those branches of horticulture and agriculture which can only be prosecuted in such a region.

Statistics prove that in general peninsular Florida is as healthy a region as southern California. They also prove that it possesses equally as fine and stable a climate if not a superior one.

In many other respects there are such radical differences between the two countries that a comparison or rivalry is impossible.

Each has its own unique peculiarities and attractions in scenery or topography and productions. We contend, however, that after summing up everything, peninsular Florida has the weightiest inducements to the poor man or to the one of moderate means and that the very successes obtained in California at great expense in the outlay of capital and labor are evidences in our favor, for here equally as great results can be obtained at far less cost.

Many thousands of acres of excellent fruit lands, equal in all respects to those of California, can be obtained at prices utterly insignificant in comparison. Some are even to be had as homesteads, or at government prices.

Fortunately also we have no wild speculative boom, preventing by high prices any but those already in possession of ex-

tensive means making investments. There is only a steady growth in values in those sections partially improved, based upon development and actual profitable results achieved by those who have invested.

It is different with the rival state. We challenge contradiction when we say it is utterly impossible to maintain the excited and exaggerated speculations now booming in California and the great majority of the thousands going there are certain to be bitterly disappointed in their dreams of golden wealth to flow in a perpetual stream into their gaping pockets. California like Florida, has room for steady industry to amass independence, but to dream that everybody who has a few hundreds can invest in corner lots, suburban property, orange groves and fruit orchards at popular prices, and be lucky enough to unload on someone else at still more exaggerated prices is simply the gambler's vision.

Those who are doing so are preparing the way for disappointment and financial ruin.

To buy a section of hillside, valley or arid plain; provide water for irrigation either by costly artesian wells or a yearly rate to some water monopoly, buy nursery stock at exorbitant prices, go into the orange, fruit or vegetable business many hundreds of miles from any market, paying from \$300 to \$1,000 per acre for the privilege of inaugurating an experiment in a business of which the majority now going there know nothing, is, to say the least, foolhardy, and will be followed by the usual results.

Years ago the same fever had its run in California and hundreds of financial wrecks are to be found in every corner of that state. No danger of these old victims taking a relapse. But pouring into the same theaters of unfortunate speculations is a tide of new victims crazy with the same fever.

Better far the steady perpetual development of Florida even if it seems by comparison too slow. There are here lands which can be secured at \$10 per acre equally as good and in many respects better than the lands in the neighborhood of Los Angeles and Riverside held at the prices quoted above, nearer to market, as healthy and pleasant to live upon, costing nothing for annual water supply, needing nothing after the cost of purchase, clearing and planting, which cannot be supplied by the owner's industry to produce a quality of fruit unexcelled by any lands.

The time has been, only recently, (and we believe it will come again), when Florida exceeded California, in fact any other country, in the quantity and quality of oranges and other citrus fruits produced, obtaining far more remunerative prices. But outside of this the range of productions either for shipment or home use is as varied and unlimited as that of the California territory, compared. Besides all this, Florida is far

more suited in equalities and other qualifications to the poor man or the one of moderate means than is California.

It is true that the choicest, rich marl hammock, on which grow wild orange trees, is held at from \$15 to \$25 per acre, but even this high price, compared to other lands, dwindles into insignificance when compared with the cost of the California lands.

Taking these things into calm conclusion it is certain that there must be extraordinary artificial causes for the difference of emigration in the two countries, and it is our prophecy that when these artificial stimulants have been withdrawn there will be another California collapse worse than any previous one, and renewed attention paid to the most modest and worthy claims of the peninsular state.

CRYSTALLIZATION IN MOVEMENT.

At the annual general meeting of the French "Syndicat des Fabricants de Sucres," held at Paris on the 5th of April, a communication from M. P. Harsin-Deon was read on the above subject. The editor of the *Sucrerie Indigene*, M. Emile Legier, gives a summary of the lecture, a translation of which we here present to our readers, as this paper appears to contain several points of considerable interest. M. Harsin-Deon, after having stated that the process can justly claim to have been to a large extent a French invention, inasmuch as the principle was first indicated by Mehay in 1880, and the present crystallizers, more or less modified, were invented by Boequin, with the assistance of Lipchinsky, passes at once to the scientific consideration of the subject in hand; the summarization of his remarks by M. Legier being as follows:

Theoretical Principles.—In crystallization in movement, the end proposed is the reduction of the purity of the masse. The purity is a conventional term, which is formularized as y equals $100x$ divided by A plus x , y being the purity, x the sugar and A non-sugar. Developing this formula we have $100x - xy - Ay$ equals 0. This is the equation of a hyperbola passing through the origin and having for asymptotes plus 100 and $-A$. On tracing the curve and varying A , we see that, for a given value of y , the larger A is the larger x becomes. From which we conclude that the larger A is the less must be the extraction of sugar ($x - x$) to obtain a given lowering of y . Hence, if we are extracting the sugar from a mother liquor, if we wish to arrive at a low purity, we must start from a masse cuite which is itself of low purity.

The limit of exhaustion is fixed by the quality of water left in the masse cuite; water which parts with its sugar as far as the solubility of sugar in that quantity of water.

Hence, the maximum of exhaustion is obtained by leaving the minimum of water in the masse cuite.

The tables of solubility of sugar give the limit of exhaustion, and enable us to calculate it, and also to calculate the quantity of water which must be left in the masse in order to obtain a given exhaustion. On tracing the curve of the exhaustion we find that it is a parabola. Hence, the degree of extraction of sugar is in proportion to the square root of the time.

The phenomenon chiefly affecting the time of extraction of the sugar is viscosity. Now the most efficacious means of diminishing the viscosity of a liquid is heating it, for viscosity is the inverse function of the square of the temperature. In order then to obtain an easy extraction the masse must be run hot into the stirring apparatus. Further, the sugar being thrown down rapidly, the cooling of the masse in the stirring apparatus must at the same time be rapid in order that the mother liquor may be always saturated, but not more rapid, under penalty of throwing down fine (false) grain.

Hence, we must empty hot and cool down quickly, the cooling taking place *pari-passu* with the extraction of the sugar, so as to continually obtain a saturated mother liquor. Again, the purer the masse cuite the more easy the extraction of the sugar, and hence, the time required for stirring will be shortened in proportion as the masse is rich in sugar and vice versa.

Application of the Principles.—Example: We have to extract all the sugar from a masse cuite, the mother liquor of which has a purity of 66 degrees. It is desired to bring this down to 54 degrees, knowing that the final temperature of the stirring process will be 45 degrees. The tables of solubility give the content in water and sugar at 45 degrees. From this we deduce by the formula of purity the quantity of non-sugar corresponding with a purity of 54 and a temperature of 45 degrees, and we thus obtain the final composition of the mother liquor. Knowing the non-sugar contained in the final mother liquor, which is the same as that of the initial mother liquor, we deduce from it the composition of the initial mother liquor at 66 purity, simply by applying the formula y equals $100x$ divided by A plus x , and we are thus in possession of the two extremes of the composition of the masse which we are crystallizing. The tables of solubility give the temperature at which the primitive mother liquor is saturated for the content in sugar and in water found in the preceding calculations. In the above example this is 87.5 degrees. We must then run off the masse into the mixer at 87.5 degrees.

The extraction of sugar is in proportion to the square root of the time. If then we know beforehand that such a masse cuite requires, say forty-eight hours stirring, we can make a table by dividing the extraction of sugar ($x-x$) proportionally to the

square root of the time at which we want to make the analysis, say every four hours. This table will then give the sugar content of the masse every four hours. Knowing that the non-sugar does not change, we can deduce the purity every four hours. We thus have all the elements of the calculations necessary to follow step by step the progress in the stirring apparatus, to determine the temperature which they should have at any hour, and also the polariscope indication which the mother liquor should give at any hour.

We are thus in possession of a complete system of control, and an exact method for regulating the cooling.

Conduct of the Working with Crystallization in Movement.—With the old method of working, the centrifugalled masse cuite gives a green syrup having as a rule 75 purity. This syrup, after boiling and centrifugalling, gives sugar and molasses, the latter, when the working is properly conducted, having a saline co-efficient of fully 3.75 and a purity of about 54. The object which it is proposed to attain with crystallization in movement is to obtain in a few days the same exhausted molasses which is obtained by the long and tiresome process of settling tanks; for the problem is not solved by making molasses with a saline co-efficient of 4.5 to 5 and a purity of 60, a molasses which will still crystallize in settling tanks, with which the inventors of the new processes content themselves at present.

Can the problem "sugar and molasses" in one operation be solved, or must we make two jets? Is crystallization in movement indispensable for the solution of the problems, or can we do without it?

1. Crystallization in Movement Alone.—The mother liquor adhering to the crystals of an ordinary masse cuite of 90 purity has itself a purity of 66 to 67. On centrifugalling we obtain a green syrup with a purity of 75, in consequence of the fine grain and the melting of some crystals in the washing. If we apply the preceding calculations to such a first masse cuite we shall find that on running it into the mixers at 88 degrees and cooling at 45 degrees we shall bring down the purity to 54.

Theoretically, then, it is possible to obtain sugar and molasses direct from the first masse cuite by means of crystallization in movement.

In practice, however, we come in contact with impossibilities connected with the centrifugalling, resulting in our obtaining a green syrup of from 68 to 72, according as we are making raw refining sugar or white sugar. Possibly the Steffen-Raeymaecker's process may solve the problem.

2. Re-introduction of the green syrups without stirring.—This cannot solve the problem, for the minimum purity of the mother liquor being 66, we cannot further reduce this without

separating the runnings into rich and poor, that is making two sugars.

3. Re-introduction of green syrups with stirring, making two sugars.—This is a combination of the two preceding systems, and is the only one which will permit of the exhaustion of the mother liquor. In Russia, I have used the following method: adding green syrup until the purity of the masse was reduced to 85, and constantly maintaining this purity by continual addition to the successive masse cuites of rich green syrups, together with some poor green syrups, and second sugars remelted in the juice of the third carbonatation. The runnings were separated into rich and poor of 68 purity. This poor syrup was boiled to grain with a starter (the Abraham process being employed for this), and the masse slightly centrifugalled. We thus obtained a yellow sugar, polarizing 85 degrees, with a purity of 90, which was remelted as stated above, and a molasses of 54.30 degrees purity and 3.59 saline co-efficients.

It is then possible in this way to extract molasses perfectly uncrystallizable. Perhaps other modes of working may be capable of producing the same results, but the main point is to boil the seconds well, without fine grain. It is only a question of skill on the part of the sugar boiler in separating the grain without enriching the mother liquor in the centrifugal, and so finally producing white sugar and molasses.—International Sugar Journal.

Bananas continue comparatively scarce, and the demand is unusually active for this time of year, notwithstanding receipts of domestic small fruits are larger. There is a strong rush from out-of-town buyers for the Fourth of July trade. One feature of the situation is that other markets are reported short. It is said that the available supply here is about 82,000 bunches, while orders are sufficient to consume double that amount. Prices this week advanced strongly, and prices in other markets are higher still. It is yet doubtful whether next month's supply will be larger.—N. Y. Fruit Trade Journal.

Pineapple Sherbet. One pint of fresh or one can of grated pineapple, one pint each of sugar and water, one teaspoonful of granulated gelatine, and one lemon. Pare the pineapple, remove all the eyes, and pick off the tender part with a fork, rejecting all the hard core. If still too coarse, chop it a little. Add the sugar, water, lemon juice, and gelatine, which should be first soaked in cold water and then dissolved in boiling water. Freeze as usual.

FOREIGN REFINED SUGAR NOW.

The better feeling in sugar refining circles which has recently prevailed, and which has rendered possible a sharp advance in the prices of refined sugars during the now active season for sugar consumption, received a rather severe shock yesterday afternoon. This was in the form of free offerings of foreign refined sugars at prices sufficiently below the net prices of American refiners to render them attractive to buyers.

The offerings included Russian crystals and Austrian granulated, Lion brand, at 5 $\frac{3}{4}$ c. It was explained by interests friendly with the importers that the sugar now being offered was purchased before the recent advance in raw sugar took place, and they do not therefore anticipate any further large shipments to this country unless local refiners should advance their selling prices to a point allowing a sufficient margin of profit.

The local advance in sugars started May 20. On that date granulated was advanced 5 points, making the net price 4.95. Since then there have been additional advances. Meanwhile the market for raw sugars has advanced. The current difference between raw and refined is the highest since November, 1897. In July of that year (the active canning season) the difference was 1.023c per pound, and this difference was gradually reduced until March, 1898, when it stood at 7.65c. Then an increase took place culminating in a difference of .965c in July (again the active season) of that year, followed by an irregular reduction until May of last year, when it was .379c. The June difference was .756c. Subsequently the difference was cut down to .481c last May and has now been gradually increased to .875c. Mr. Havemeyer testified before the Industrial Commission that he had never heard of a cost of refining less than $\frac{1}{2}$ c per pound. Mr. Post figures .62 $\frac{1}{2}$ c per pound.

The Tariff Act fixes the duty on sugar not above No. 16 Dutch standard in color, if not testing above 75 degrees by the polariscope, at .95 cent per pound, with .035 cent per pound additional for each additional degree of test. On sugar above No. 16 Dutch standard, or refined, the rate is 1.95 cents. The raw sugars most commonly used for refining vary from 94 to 97 degrees, 96 being considered best. The duty at 96 degrees is 1.685 cents. The Treasury Department estimates that it requires 108.1 pounds raw to make 100 pounds refined. The duty on this amount of raw would be \$1.82148. In estimating the amount of protection to American refiners from the duty on refined sugar, the amount of refined obtained from a given quantity of raw sugar is decisive. Prior to 1898 the Treasury Department estimated that 92 pounds of refined were obtained from 100 pounds of raw. Improvements are continually being

made by which a large proportion of refined is obtained, especially by making new combinations of raw sugars of different degrees. Such changes in production had, it is claimed, made the Treasury estimate too low some time before it was raised, in 1898, to 92½. Taking the Treasury Department estimate that 108.1 pounds of raw sugar at 96 degrees are required to produce 100 pounds refined, the tariff on that amount of raw sugar would be \$1.82148, making the differential duty, or protection to American refiners, 12.852 cents per hundred pounds, since the tariff on refined sugar is \$1.95. Mr. Post, president of the New National Refining Co., believes that the actual differential duty is more nearly 15 or 17 cents than 12½ cents per one hundred pounds. Mr. Doscher also estimates that a production of 93 pounds of refined sugar from 100 pounds of raw sugar is more nearly correct than 92 pounds.

Opinions differ as to the sufficiency of this differential duty to protect American refiners and as to its effect on prices and consumers. The rate of protection, according to Mr. Havemeyer (assuming the differential to be one-eighth cent per pound), amounts to 3½ per cent. ad valorem, and does not cover the difference in the cost of refining between this and foreign countries. The actual difference in cost of refining between the United States and Europe is, he believes, probably between 0.12 and 0.15 cent.

Mr. Jarvic, of the Arbuckles, in testifying before the Industrial Commission, argued that if the then existing margin of difference between raw and refined sugar now prevailing should be raised to a remunerative figure there would be foreign competition.

Some time ago when the factor plan was in operation there was a prevailing belief that the sugar trust would cut off from its list of factors any wholesale grocer or confectioner who would purchase foreign supplies or supplies from outside refiners. Interests with close business relations with the trust said last evening that while the factor plan had been abandoned the trust would undoubtedly let it be known that it would not consider as its friends any large buyers of foreign sugars.—New York Journal of Commerce.

The discontent among laborers on some of the plantations has been owing entirely to the harangues of their leaders of the Dennis Kearny stripe. On most of the plantations, where the agents of the consuls have explained the changed conditions, and advised their countrymen, the men and women have remained quietly at work, receiving their three or four dollars increase of monthly wages. The proposition to introduce negroes as laborers in the cane fields is not looked upon favorably by sugar planters, though a trial may be made on this

line, even at the risk of a clash between the negroes and the celestials.

SUGAR AS FOOD.

Prof. Pfuhl, head of the physiological laboratory of the German army, has lately concluded a series of elaborate experiments which have confirmed the results of previous investigations, namely, that sugar is a valuable article of diet, particularly for persons called upon to perform a large amount of muscular exertion, one of its salient points of merit being that it is readily assimilated by the blood. Prof. Pfuhl found that after long and fatiguing walks the soldiers recuperated in from fifteen minutes to half an hour if they were given several lumps of sugar. These appeared to remove all feelings of lassitude and to restore the muscles to their original elastic condition.

These inquiries are not altogether disinterested. Quite the contrary. Two-thirds of the world supply of sugar is made from beets, and more than one-third of the total production of beet sugar is credited to Germany. Part of this amount she is able to sell to foreigners. But the greater part of it she consumes herself. Now, expropriation is liable to fall off at any time, and it is highly probable that the manufacture will continue to increase. Hence it is desirable from the German point of view, to promote the use of sugar as far as possible. However, this motive does not impair the value of the investigations recently made. Indeed, it imparts greater interest to the latter.

It is a rather curious fact that, although Germany makes an enormous quantity of sugar, her people are not the largest consumers of that commodity. Statistics for 1897 show that in England the average amount consumed per capita was 85.7 pounds a year, whereas in Germany only 26.6 pounds were eaten. Americans ate on an average 62.3 pounds. Hence it would be practicable to double or even treble the consumption in Germany without any appearance of excessive indulgence.

Starch forms a considerable portion of our diet in one form or another, and all starch has to be converted into sugar by the saliva and intestinal juices before it can be assimilated. The action of these ferments break it up into simpler chemical compounds, so that it finally reaches the blood and muscles as dextrose, a form of sugar which can be burned to yield heat and muscular energy. The change required in sugar for its assimilation is very slight compared with that required for the digestion of starch. It will thus be seen that the process of manufacturing sugar from its vegetable containers results in a product that for digestive purposes is comparable to partially digested starch, so that it is evident the substitution of sugar

for starch is of advantage to the digestive system, since it does not burden the digestive tract and less force is required for its digestion and assimilation. Unfortunately, however, nature will not tolerate man's attempt to present concentrated chemically separated pure foods all ready for assimilation, except in limited amounts, and this is true of sugar, as of peptones, partially digested meats and similar foods.

Sugar now forms part of the rations of the soldiers of all the principal nations; its make-up, as is well known, is scientifically proportioned to supply the necessary amount of muscular energy, heat and vitality of the soldier. Prof. Mosso, an Italian investigator, as early as 1893, called attention to the influence of cane sugar in lessening fatigue. Last year the Prussian government took up the question and made thorough and complete experiments with the ergograph, an instrument which measured the amount of work done by the persons under test. The subject of each experiment was entirely ignorant of its nature, and the instrument which registered the amount of work performed was hidden from view, so that imagination could not affect the results. In addition to his ordinary diet he was given about six ounces of a sweet fluid. On certain days this was a solution of sugar, and on other days was only water sweetened with dulein, a sweet-tasting chemical having no food value. When only ordinary muscular work was performed the effect of the sugar in the diet was not very marked, but when exhausting work was required of the subject of the experiment the "difference in the effect of dulcin and sugar became very apparent, the latter restoring to some extent the efficiency of the tired muscle, while dulcin did not." This is believed to be due to the fact that with ordinary exertion a little more or less sugar in the blood does not make any special difference, but when the muscles are heavily drawn upon the rapid assimilation of this sugar proves of great advantage.

Continuing these successful experiments the German army officials put them to practical tests during their late manoeuvres, the observations extending over thirty-eight days. A number of men were given ten lumps, about one-sixth of a pound, of sugar daily, and were compared in various ways with the men performing the same amount of work in marching and drilling, but whose food contained little or no sugar. The sugar was relished during the whole time, and proved of decided advantage to the men using it. On long marches it appeased hunger and mitigated thirst: a feeling of refreshment followed, which helped the tired man on his way, and none of the soldiers allowed sugar were at any time overcome by exhaustion. Both their pulse rate and breathing was less affected by exertion than was the case with men having no sugar.

The Swiss guides, it is asserted, fully appreciate the value of

sugar as a stimulant, and always carry it in their kits, preferring lump sugar or highly sweetened chocolate. The muscular lumbermen of Canada consume an extraordinarily large amount of sugar during the season in the woods, taking it in the form of molasses. They sweeten their milkless tea with it, make cakes with it, and even add it to their fried salt pork, which is the only meat they get during the time they are in the woods cutting lumber, and this is practically half the year. In the "black belt" of Alabama the staple articles of diet are also molasses, salt pork and corn meal. These simple articles form the diet day in and day out, year about, and yet the negroes appear to thrive on them. But it is on the sugar cane plantations, perhaps, where the value of sugar as an article of diet is most apparent. A pamphlet entitled "Sugar as Food," recently issued by the Department of Agriculture, referring to this fact, says: "For months the chief food of the negro laborers on the plantations is said to be sugar cane, and they are seen to grow strong and fat as the season advances. They go through the hard labor of harvesting the crop and come out in fine condition, although they began it weak and half starved."

It should be added, however, that the entire juice of ripened cane is more complete food than sugar, containing, as it does, other food constituents besides carbohydrates.

Children have a natural craving for sweet things, and the sugar of milk, which makes up from 4 to 6 per cent. of it, forms an important part of baby's first nutriment, taking the place of starch until the child's stomach is able to assimilate it, so that a two-year-old child drinking two quarts of milk a day consumes in this way about three ounces of sugar. Owing to its ease of digestion, and the fact that it supplies heat and energy to the body, sugar would seem to be a natural food for children and is far more acceptable to most children than fat, which usually supplies heat and energy to adults. The question whether the use of too much sugar by children does not pervert their tastes from less highly-flavored and nutritious food has to be considered.

A lump of sugar contains as much nutrition as an ounce of potato and is far more easily assimilated. In times of great exertion, as are likely to occur in army life, this feature is particularly valuable. In warm countries sugar takes the place of fat, and either sugar or sweet fruits, as dates, figs, etc., are eaten in large quantities in tropical climates. As a source of muscular energy sugar is rapidly becoming recognized, so that training diets are sometimes made to include large quantities of it, as, for instance, in the rowing clubs of Holland.—National Baker.

The tabulation of the Cuban census shows things worse educationally than we had supposed, only fifteen per cent. of the adults able to read and write. This will make a very small and aristocratic electorate, if our Government shall insist on educational condition of suffrage. Spain made no such restriction, nor should we. Intelligence will control in the long run, and universal suffrage is the safer, and tends most to insure universal education.

CUBA AS A FRUIT-GROWING COUNTRY.

In a recent address before the National Nurserymen's Association, Mr. P. J. Breckmans, the well known authority on horticultural subjects, giving his ideas of the future and possibility of Cuba, says:

Landing on the coast of Cuba, as the writer did, one Sabbath morning by chance, when our vessel ran her bows on the beach at Piscadora, the consequent delay of twenty-four hours enabled us to make a short tour to a fishing hamlet. A sugar planter living near extended the hospitalities of his home, a courtesy we accepted, for we found much to interest one engaged in horticultural pursuits, though the class of trees and plants is somewhat different from what the nurseryman comes in contact with here in the states.

The island of Cuba, as we well know, is composed of various soils, all of which are rich in plant food, and fertilizers are seldom used, in fact almost unknown. The mountains are of coral formation, and the lowlands are extremely rich in lime and phosphates. The wealth of this island lies in the fertility of her soil. The principal industries of Cuba have been for many years the cultivation of sugar cane. Cattle raising has been an important industry in the past but has never been developed to the extent which the natural conditions would seem to warrant. Besides sugar, tobacco and coffee, Cuba produces all the fruits known to the tropics, and many belonging to the temperate zone. Among these are the pineapple, banana, mango, guava, lime and orange. This latter fruit might be greatly improved by growing the improved varieties, and also the great advantage to be derived from crossing with some of the native varieties. There are but two seasons in Cuba, the dry and rainy. The rainy season begins in May and ends in October, and two-thirds of the rainfall occurs during the months from June to October; now, here might be a difficulty that would confront the growing of fruits not native to the country, but this could be overcome by irrigation, as the country is well watered with creeks, rivers and other natural reservoirs, which could be used to great advantage in the dry season.

It would be difficult to arrive at a conclusion in regard to

which of our fruits would do well in Cuba, as nearly all experiments which were being carried on subsequent to the war were abandoned and suffered from neglect. In Santa Clara Province there were quite a number of planters who were growing on a small scale Japanese plums, persimmons, pears, peaches and apricots, all of which were fruiting and doing well, but our correspondent says that they were abandoned during the insurrection and but few varieties have survived. Blackberries have been repeatedly tested, but seem to be a failure, as the varieties are not adapted to the climate. Strawberries do well and yield most abundantly. On the highlands about Trinidad in this province, apples have been grown without any special care, large and fine-looking fruit, but of poor quality, owing to the variety planted. Pears also do well in this locality, but those tested were of poor quality. I learned that these plantings were from seed brought from Spain. There seems to be no doubt that many of our fruits would do well on the Trinidad hills, as the climate is very much more temperate than on the lower plains. Peaches of the Chinese type should be given the preference in planting, as they seem more suitable to the extreme southern latitudes, but many of the early ripening varieties of the Persian type would no doubt succeed equally as well.

This country offers an inviting field of labor for horticulturists in its vast extent of rich soils of every variety and its varying altitudes ranging from the sea to the mountains, a country fast filling up with a new and enterprising population and it will doubtless sustain a corresponding superiority in the cultivation of fruits. Owing to the unsettled condition of the country, there is little yet being done in the line of horticulture, but with all government affairs finally settled, as they promise to be, it seems as if there might be a future for the nurseryman in Cuba and Porto Rico, in the line of citrus fruits much better than in pomaceous or stone fruits.

"THE TWO GLASSES."

The following anonymous poem was sent by Lieutenant-General Miles to the editor of the New York Christian Advocate:

There sat two glasses filled to the brim
On a rich man's table, rim to rim;
One was ruddy and red as blood,
And one was as clear as the crystal flood.
Said the glass of wine to the paler brother:
"Let us tell the tales of the past to each other.
I can tell of a banquet and revel and mirth,
And the proudest and grandest souls on earth

Fell under my touch as though struck by blight.
Then I was king, for I ruled in might;
From the heads of kings I have torn the crown,
From the height of fame I have hurled men down;
I have blasted many an honored name;
I have taken virtue and given shame;
I have tempted the youth with a sip, a taste,
That has made his future a barren waste.
Far greater than a king am I,
Or any army beneath the sky.
I have made the arm of the driver fail,
And sent the train from the iron rail;
I have made good ships go down at sea,
And the shrieks of the lost were sweet to me;
For they said: 'Behold, how great you be!
Fame, strength, wealth, genius, before you fall,
And your might and power are over all.'
Ho! Ho! pale brother," laughed the wine,

"Can you boast of deeds as great as mine?"

Said the water glass: "I cannot boast
Of a king dethroned or a murdered host;
But I can tell of a heart once sad
By my crystal drops made light and glad;
Of thirsts I've quenched and brows I've laved;
Of hands I have cooled and souls I have saved.
I have slept in the sunshine and dropped from the sky,
And everywhere gladdened the landscape and eye;
I have eased the hot forehead of fever and pain;
I have made the parched meadows grow fertile with grain.
I can tell of the powerful wheel of the mill
That ground out the flour and turned at my will.
I can tell of manhood, debased by you,
That I have lifted and crowned anew.
I cheer, I help, I strengthen, and aid;
I gladden the heart of man and maid;
I set the chained wine-captive free,
And all are better for knowing me."

These are the tales they told each other,
The glass of wine and its paler brother,
As they sat together, filled to the brim,
On the rich man's table, rim to brim.

RICE AS A FOOD STAPLE.

Rice is becoming more and more an important article of alimentation, as is evidenced by its increased importation. It remains a favorite dish among sweets, is largely consumed in soups, and in madeup dishes, while being extensively utilized along with wheaten flour to secure greater whiteness of the bread. It is also largely used to make starch. The rice emanating from South Carolina and from British (Burmah) are the two varieties most in request. Japanese rice of late meets with a fair demand. Indeed, when it is borne in mind that rice feeds one-third of the human race, and that it is considerably cultivated in Asia—no less than 100 different varieties alone are peculiar to British India and Ceylon, and Northern and Central America—the importance of the plant of its product will be much better appreciated. Its growth has been attempted in Northern France, and the experiment was tried with partial success of raising it south of the Thames, outside London. Rice exacts a warm climate, but above all, a humid soil; hence, why the growing crop has to be irrigated with so much care. Before being harvested, etc., the soil is freed from water, the crop duly cut with the sickle, and it is next threshed by means of the flail or by machinery; in some cases the grain is simply trampled out by cattle. The rice which has been obtained in the latter way, in the husk, is called "paddy." the grain adheres firmly to the husk, so much so, that special machinery has to be employed in order not to injure or break the grain.

The superiority of Carolina rice is due principally to the extreme care taken by the American growers to turn out clean samples. After it is husked, the grain passes through a whitening machine, which removes the inner cuticle or red skin. This done, the rice is fit for sale. Like the potato, rice is largely employed to prepare starch; it is treated with a solution of caustic soda, which dissolves out the nitrogenous matters; the starch deposits, and is weighed and dried. The analysis of Chemist Payen and that which is generally accepted, gives the composition of rice as follows: Nitrogenous matter, 7.55; starch, 88.65; dextrine, etc., 100; fatty matters, 0.80; cellulose, 1.10; and mineral matters, 0.90. Rice then resembles nearly the composition of the potato, which contains, as will be remembered, so much starch and so little nitrogen, fat and mineral substances. It explains also why rice is not a complete food, and why it is necessary to supplement it with meat, vegetables or fish. But rice possesses the great advantage of being easily digested, and does not fatigue or inconvenience the stomach. Hence, its efficacy as a remedial agent in cases of diseases of that organ, and of the intestinal channels. It

exercises no laxative action as other cereals are reported to do, and which explains the efficacy of rice in cases of dysentery and diarrhoea. China is able to produce two crops of rice every year; the Chinese sow it in March and July; the inhabitants of the Flowery Land pride themselves on completely understanding its cultivation, the whole secret of which is to give the plant a great deal of water. It may not be generally known that the Americans were indebted for this grain to a Mr. Dubois, who was treasurer of the East India Company, and who gave a small bag of the said grain to a merchant of Carolina. This is how Europeans came to be chiefly supplied from Africa with Carolina rice, and which is everywhere accepted as being much the finest of its kind, the grains being double the size of that which comes from the East Indies, and known as Patna rice. Rice is said to be best cooked by thorough steaming; while in case of sickness, rice water can be prepared, sweetened and flavored, in the same way as is barley water.

The rice when being turned out for market, is sifted and classified into five categories; one, known as broken rice, which is not to be disdained; if well cleaned, it will form an excellent mucilage, or when ground into flour, it can be mixed along with some wheaten meal, and thus cheapen, as well as whiten loaves of bread. Japanese rice is said to be rich in nitrogeous substances, no matter whether it be the upland, mountain or lowland varieties. In some districts of India, rice is not allowed to be consumed until after a lapse of six months from the time it is gathered; many even prescribe a longer period. A good hour is allowed for the digestion of rice. If the rice be anyway old, it is of course more difficult to digest. A very strong spirit is obtained from rice called ar-rack, which is partly made from it, being also mixed with toddy, which is the juice of the cocoanut tree. Sake is another national beverage prepared in Japan from fermented rice. In many countries rice is mixed with bean or pea meal; that combination is recommended to the parched rice travelers that have to secure that kind when on long voyages in unknown lands. South Carolina claims to have obtained the first seed rice from the Island of Madagascar, between 1700 and 1720. The importation of rice into the United Kingdom is nearly 80,000,000 of cwts. annually and estimated at 3,500,000 of pounds sterling. Strange, though nevertheless a fact, that rice was not known to the ancients, and there is no mention of it in the Bible.—London Correspondent in Grocers' Criterion.

THE BORER PEST ON COFFEE TREES.

In the Central African Times Mr. J. W. Moir, of Milanje, India, writes on this subject in such manner as to show that

coffee planters in those parts have a good many "insect enemies." He says that immense damage is done by the larvae of the borer beetle, and his efforts to unearth eggs, with a view to their destruction, do not appear to have been very successful. Some of Mr. Moir's remarks have a gruesome humor of their own. For instance, he says: "The first thing that struck me was the discrepancy between the number of males and females. They are exceedingly alike. Both have the same number of tarsi, and the same number of joints in the antennae. When the females are full of eggs their abdomen is more distended. But after they become pets and are watched and fed day after day, it becomes easier to judge of the sex. The only certain way (so far as I know), however, is to cut them open. I did this to 117, caught during the forenoon of Saturday, the 30th December, and hurried through this unpleasant work somewhat more quickly than scientific accuracy demanded, but I made out 111 females and only 6 males."

Then he describes the methods of procedure of the beetles without respect to sex: "At last I found them laying their eggs. I send you a section of a coffee stem, which stood upright under a bell jar. It simply stood on a book. The lower ends of others were buried in earth, without making any apparent difference. The beetle stood on the branch with her head down and in three or four minutes bit a small deep hole right down to the solid wood. She then turned round and having found the hole, with a strong leathery ovipositor she enlarged it, bending it right below her body and upwards between the bark and the wood. She then passed in the egg, pushing it up under the bark, and finally covered it up and nearly filled up the hole with a gummy substance, which seems quite hard and glassy when dry. This substance is not very soluble in water and preserves the egg from much harm that might otherwise destroy it. I have had such eggs out for three weeks in a bottle, exposed to all the sun there was, and they have not yet hatched out, although you will observe in one of the eggs sent, a nearly complete borer grub was expected when I purposely broke the egg. Mr. Cameron's Spotted Bug hatches out in six days under similar circumstances. All the eggs in this case, but one, were laid within half an inch of the bottom, and this seems to indicate that the collar of the coffee stem, or just above the soil, is the first choice of the beetles: although many grubs are certainly hatched not far from the top of the stem."

Turning to the question of remedies and preventives, Mr. Moir concludes that the final solution will probably lie in providing ample shade. He believes that the Coorg "borer," "which destroyed hundreds of acres of coffee in Coorg during 1865 and 1866" (Arnold's coffee cultivation, page 124) has been driven from the field by shade. It is also a longicorn

beetle, called *Xylotrechus quadripes*, and he adds: "When our shade comes in full usefulness, let us hope that it will amidst many other benefits, vanquish this enemy also." He might note in the meantime, however, what an American writer has to say on the subject: "There are two means which can be employed in controlling the insects which bore into the trunks of trees. These are clean culture and the use of such measures as will dispose of eggs upon the trees. It is hardly probable that the trees can be saved after they have once become infested with the borers. The only thing to do then is to cut them off and burn by the first of May before the adult insects emerge."

For our own part, we should incline to the belief that everything depends mainly on the right treatment of the plant from infancy upwards. Constitutional strength and vigor are the best preventives of disease.

GERMAN CO-OPERATIVE SUGAR FACTORIES.

Out of the 399 beet sugar factories now in operation in Germany, 186 are organized as stock companies. United States Consul-General Mason, of Frankfort, says in his report that stock in the corporations is usually issued in two categories—first, the holder of each share of stock is bound to cultivate annually a prescribed area of land in sugar beets and deliver his product to the factory. He can only sell his shares by permission of the company to a purchaser who will assume all the obligations with regard to growing and delivery of beets. Stock of the second class is held by any investor, and is issued for the purpose of securing additional capital, over and above the ability of the surrounding farmers. In one such company noted, each share of the first class stock is sold for \$95.20 and binds the holder to cultivate one and four-fifths acres of beets. This is considered a fair example of the German companies of this class. Most of the more recently organized companies, however, are issuing only the first class of stock. As the conditions of beet culture becomes less favorable, it becomes more difficult to secure more beets than is represented by the stock. Consequently, in order to assure a supply of beets, the proportion of this class of stock is increased. Consul Mason concludes his observations as follows:

The factories organized and operated on the co-operative principle, as above described, are the most successful sugar factories in Germany, for the reason stated—that one set of stockholders reap all the profits incident to both beet growing and sugar manufacture.

The number of sugar factories in Germany is not increasing, but the capacity of many existing factories is being enlarged and the co-operative principle extended in applica-

tion, so as to bring the whole industry more and more under control of the agricultural, as distinguished from the capitalist classes.

"To what particular circumstances are co-operative sugar factories adapted?" Primarily, in a country or district where beet culture and sugar manufacture do not already exist, the co-operative principle enables a number of farmers who wish to engage in beet growing to secure what is essential to their experiment—the erection of a factory which will buy and work up their beet product. Second, co-operation is especially advantageous whenever, as at present, the selling price of sugar is so low as to oblige an independent factory to pay small prices for beets and work generally with extreme economy and on close margins. Under the co-operative system the whole industry is concentrated in the hands of agriculturists, who are thus rendered independent of mere capitalists, who would contribute nothing but money and might demand a larger income from their investment than the business would legitimately yield. Finally, co-operation secures permanence and certainty, so far as that is possible, to the whole sugar producing industry, by assuring to the sugar factory an adequate supply of beets for profitable operation, and, on the other hand, gives to the farmer a definite market for his beet crop, at a price in the fixing of which he, as a stockholder, has a voice and vote.—Chino Valley (Cal.) Champion.

THE JAVA SUGAR FACTORIES.

The following information regarding the sugar factories of West Java is taken from a detailed report of the working of the thirty-seven factories in that district, for the year ending December, 1899. These details cannot fail to be of interest to planters:

Size of Factories.—From 210 to 790 long tons per 24 hours; average 450.

Method of Extraction.—One factory employed diffusion and used 28.6 per cent. of added water. Double crushing was employed by 13 and treble crushing by 23 factories. Maceration water was used by all but two factories; the amount of added water expressed per cent. on first mill juice varied from 5.0 to 21.0, with an average of 13.1.

Preparatory Treatment of Cane.—Twelve factories used a Ross cane cutter; one factory a cane breaker.

Clarification.—The carbonation process was employed by eight factories, the remainder using the ordinary defecation scheme.

Filtration.—Taylor bag fillers were in use in three factories.

Treatment of Molasses.—In 27 instances the molasses were

continually boiled in, for first sugar, only 10 factories making two products.

Treatment of Masseccite.—Crystallization in movement was employed in 22 factories, 15 houses allowing the masseccite to cool at rest.

Loss in megass per 100 sugar in cane varied with mill work from 7.36 to 15.60. The former figure was obtained with treble crushing and 14.6 per cent. added water, the latter figure being for double dry crushing.

Loss in molasses and unknown losses per 100 sugar in cane varied from 3.29 to 14.91.

Loss in filter presses per 100 sugar in cane varied from .22 to 2.17.

Extraction of sugar at 100° per 100 sugar in canes varied from 86.5 to 68.1, with an average of 80.3.

Extraction of sugar at 100° per 100 sugar in juice varied from 94.9 to 77.1, with an average of 89.2.

Composition of juice.—The juice contained from 14.37 per cent. to 18.46 per cent. sugar, the purity lying between 85.40 and 93.00.

Recovery of sugar at 100 per cent. on cane varied from 9.46 to 13.08.

Those conversant with Demerara factories will at once see that on nearly all points we are not so advanced as our colleagues in Java. In that country more than half the factories have treble crushing mills and crystallization in movement plant. The adoption of the former reduces the enormous losses in megass to the economical minimum, and with boilers of modern construction does not entail expenditure in fuel. By the employment of the latter, loss in fine grain is avoided, and low-grade low-priced after-products are almost completely suppressed.—Demerara Argosy.

THE SPRECKELS SUGAR PLANT.

The Spreckels sugar factory, the largest in the world, with a capacity of 3,000 tons every 24 hours, turning out 450 tons of raw or refined sugar every 24 hours, is being gotten ready for the approaching campaign.

For this plant there are now 30,000 acres of beets under cultivation which entail an expense for labor and seed of \$22 per acre, in the aggregate \$660,000. The same land sown to grain would entail an expense for seed, labor, harvesting and sacks of \$5.25 per acre, or a total of \$157,500—a difference with some significance. An element further to be considered in the problem of labor is that in hauling the grain crop one carries about three-quarters of a ton per acre, while with the beet crop one has 12 tons to the acre. Experience has also proven that after use of land for beet crops it is cleaner, and

far better results are had in growing grain. The pulp from the factory will feed and fatten thousands of head of cattle.

The great factory has cost about 2,500,000. In addition to this, land has been purchased and other improvements made, which will swell the amount expended by the Spreckels company on their great undertaking to \$3,000,000.

There will be distributed during the operating season \$12,000 per day for beets and \$5,000 per day for labor and operating expenses. It will require 30,000 acres of land to supply the demands of the factory. Salinas valley affords 90,000 acres for beet cultivation.—Michigan Sugar Beet.

It may be mentioned that missioneries and persons going out to the German tropical colonies are instructed in botany and plant-raising at the Central Experimental Station in Berlin. Such enlightenment and instruction is what the natives in all colonial centres stand greatly in need of, and it might be taken over by Britishers with advantage.

APPOINTMENTS BY THE PRESIDENT AND GOVERNOR.

- Sanford B. Dole, Governor.
 Henry E. Cooper, Secretary.
 W. F. Frear, Chief Justice.
 Antonio Perry, First Associate Justice.—Honolulu.
 Clinton A. Galbraith, Second Associate Justice.
 Abram S. Humphreys, Judge First Circuit.—Honolulu.
 R. B. Silliman, Judge First Circuit.—Honolulu.
 John W. Kalua, Judge Second Circuit.—Maui.
 W. S. Edings, Judge Third Circuit.
 Gilbert F. Little, Judge Fourth Circuit.—Hilo.
 J. Hardy, Judge Fifth Circuit.—Kauai.
 Morris M. Estee, United States District Judge.
 John C. Baird, United States District Attorney.
 Daniel A. Ray, United States Marshall, Honolulu.
 E. R. Stackable, Collector of Customs.
 William Haywood, Collector Internal Revenue.
 J. M. Oat, Postmaster.
 J. A. McCandless, Superintendent of Public Works.
 Alatau T. Atkinson, Superintendent of Public Instruction.
 E. P. Dole, Attorney-General.
 Arthur M. Brown, High Sheriff.
 Charles F. Chillingworth, Deputy High Sheriff.
 H. C. Austin, Auditor.
 H. C. Meyers, Deputy Auditor.
 J. F. Brown, Commissioner of Public Lands.
 W. D. Alexander, Surveyor.

A. T. Hawes, Private Secretary to the Governor.

T. F. Lansing, Treasurer.

Wray Taylor, Superintendent of Agriculture.

The following are from the Customs authorities:

E. T. Bailey, Collector of Customs at Kahului.

Jno. Smithies, to be Collector of Customs at Mahukona.

Frank L. Winter, to be Collector of Customs at Hilo.

Captain Macauley and Chas. Durfee to be discharging clerks under the civil service rules at Honolulu, and George Stratemeyer to be Deputy Collector of Customs at Honolulu.

The world's coal production last year is estimated at 775,000,000 net tons, the largest quantity ever mined in one year. And yet with this enormous supply prices advanced, and in many places factories and workshops had to suspend operations, with large orders ahead, for want of coal. The revival of industry suddenly enlarged demand and taxed transportation facilities to the utmost, and caused an advance in freight rates. The United States, credited with an output of 258,539,650 tons net, was the only great industrial country in which the available supply was equal to the great demand.

A KIPLINGESQUE POEM.

A woman there was, who wrote for the Press
(As you or I might do.)

She told how to cut and fit a dress,
And how to stew many a savoury mess,
But she never had done it herself, I guess
(Which none of her readers knew).

Oh, the hour we spent, and the flour we spent,
And the sugar we wasted like sand,
At the 'best of a woman who never had cooked,
(And now we know that she never could cook),
And did not understand.

A woman there was, and she wrote right fair
(As you or I might do),
How out of a barrel to make a chair,
To be covered with chintz and stuffed with hair,
'Twould adorn any parlor and give it an air!
(And we thought the tale was true).

Oh, the days we worked and the ways we worked
To hammer and saw and hack,
In making a chair in which no one would sit,
A chair in which no one could possibly sit,
Without a creak in his back.

A woman there was, and she had her fun
(Better than you or I),
She wrote out recipes, and she never tried one,
She wrote about children—of course she had none—
She told us to do what she never had done
(And never intended to try).

And it isn't to toil and it isn't to spoil
That brims the cup of disgrace—
It's to follow a woman who didn't know beans
(A woman who never had cooked any beans),
But wrote, and was paid to fill space.

—Queensland Country Life.

Electrical science has now reached a point when we can begin to consider as a practicable proposition the conservation and distribution of the tremendous force generated by the falling waters of the Sierra. It should be carried to the farms and be made to saw wood, churn milk, pump water, grind grain, fill silos, chop feed, run sewing machines, cut sausage meat, and be handy generally. It has been idle for centuries enough.