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Jan. 12. 35-y

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(At the Store formerly occupied by I. Montgomery.)
HONOLULU, OAHU, S. I. 1y3

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Auction and Commission Merchants.
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And General Commercial & Shipping Agent,
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(Known as the firm of Hopwa & Co.,)
Bread and Biscuit Bakers; Dealers in General Merchandise, &c.,
17-136m9 HONOLULU, H. I.

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Offers his professional services to the public of Honolulu, and respectfully solicits a share of their patronage. Office at present, directly over the Polynesian office. Sept. 7, 1850.tf-17

J. MONTGOMERY.
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Office in Mr. Davis new block, Fort st., four doors from Broadway. Oct. 5, 1850 y-21

EMPIRE CITY LINE.
NEW YORK THROUGH TICKETS.
THE ONLY DIRECT LINE OF STEAMSHIPS FOR PANAMA. Through tickets from San Francisco to New York, by way of Chagres and Panama. The splendid and popular steamships SARAH SANDS, 1,500 tons burthen, W. C. Thompson, Commander, and NEW ORLEANS, 1,100 tons burthen, J. W. Wood, Commander, will leave San Francisco for Panama, direct, connecting at Chagres, with the staunch and well known steamships CRESCENT CITY, 1,500 tons burthen, Chas. Stoddard Commander, and EMPIRE CITY, 2,000 tons burthen, J. G. Wilson, Commander.
Rates of fare: San Francisco to Panama direct.
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The Second Cabin has a separate table, and the berths are fully furnished with hair mattresses and bedding, and on board the Sarah Sands are state rooms, a great advantage in point of comfort, over the unfurnished bunks of an open steerage.
Chagres to New York.
After Saloons, - - - $125
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All the above have the same table and privileges of the Saloons.
Steerage, found with mattresses and board, 65
An experienced Surgeon is attached to each steamer.
The subscribers are now issuing through tickets to New York by the above named steamers.
EVERETT & CO.
Honolulu, May 15, 1850.-1-tf

PORTER & OGDEN,
General Merchants and Commission Agents,
(Opposite the Custom House,)
11-6m HONOLULU, OAHU, H. I.

HENRY ROBINSON & CO.,
Merchants and Commission Agents,
July 13-9 y] HONOLULU, H. I.

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Ship Chandlers and Commission Merchants,
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HOUSE, SIGN, SHIP, COACH AND
Ornamental Painters,
Having re-opened the shop on the premises of C. W. Vincent, is now prepared to execute all orders with neatness and despatch, on the most reasonable terms.
Honolulu, March 28, 1850. 46tf

CHARLES BREWER,
Commission Merchant,
Refer to BOSTON, U. S.
MAKEE, ANTHON & CO.
R. W. WOOD jan4-34-y

GAVIN & HENDERSON,
Merchant Tailors.
HONOLULU, OAHU.
Jan. 12. 35-y HAWAIIAN ISLANDS.

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Dealers in General Merchandise,
jy13-9y LAHAINA, MAUI, H. I.
RICH'D H. BOWLIN. ALFRED D. CARTWRIGHT.

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House, Sign, Ship, Coach and Ornamental Painters.
(Imitations of Wood and Marble executed with neatness and despatch.)
jy13-9tf HONOLULU, OAHU, H. I.

A. F. TURNER.
Civil Engineer and Surveyor.
Hale Hoona, Alanui Beritania.
HONOLULU, August 15-6m*

J. H. WOOD,
Boot and Shoe Manufacturer,
Shoe and Leather Dealer.
At the Brick Shoe Store.
Honolulu, Oahu, H. I. Aug. 31.16y

C. H. NICHOLSON,
Merchant Tailor.
(*Establishment opposite the Seamen's Chapel,*)
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A large assortment of Broadcloths, Cassimeres, Vestings, Cashmeres and Linen Drillings, constantly for sale.
Garments made at short notice, in latest fashion.
Honolulu, Sept. 14, 1850. 1y-17

BRANDON & WOOD,
Carpenters, Joiners, and Dealers in all kinds of Building Materials,
At the old stand of C. W. Vincent.
Honolulu, October 19, 1850.—23-y.

GEORGE HARRIS,
MANUFACTURER OF
Tin, Copper, and Sheet-Iron WARE.
BROADWAY, HONOLULU,
OAHU.
N.B.—Shipwork made and repaired at the shortest notice 23—6m*

SWAN & CLIFFORD,
Ship Chandlers and General Agents,
oct 26-24 1y HONOLULU, OAHU.

LAFRENZ & FISHER,
Cabinet Makers and French
POLISHERS.
Honolulu, Nov. 1, 1850-6m-25

D. N. FLITNER,
(SUCCESSOR TO MR. E. H. BOARDMAN,)
Continues to repair CHRONOMETERS, at the old stand; accurate rates determined by frequent observations with a Transit Instrument, made by "Roskell," Liverpool.
☞ Particular attention given to fine WATCH REPAIRING. dec. 8. 30-y.

SAIL LOFT—On the premises formerly occupied by EVERETT & CO. opposite Caranave's buildings. SAILS MADE AND REPAIRED with despatch. Canvass, Rope, Twine, Thimbles, Second-hand Sails, and all necessary materials, CONSTANTLY ON HAND.
CHARLES A. TANER.
Honolulu, June 8, 1850. 6m* 4

CAUTION.
THE UNDERSIGNED hereby cautions all persons against trespassing in any manner upon his estate at Puloa salt works, on pain of being proceeded against according to Law.
C. W. VINCENT.
Nov. 10, 1849—26-tf

SUPPLIES FOR CALIFORNIA.—The undersigned are prepared to furnish Irish Potatoes in quantity at Kalepolepo or Keawakapu, Island of Maui.
JNO. RICHARDSON,
H. KUIHELANI,
GEO. SHAW,
mar16-44tf P. NAHAOLELUA.

WHIPS, UMBRELLAS, PARASOLS.
Just received a small assortment.
October 18, 1850.—23-tf. F. R. VIDA & Co.

MELSEN'S METHOD OF EXTRACTING SUGAR.

(*Translated from the French.*)

The extraordinary circumstances in which I am placed make it my duty to draw from a most extensive research a few observations tending to give an exact idea of the investigations I am pursuing.

Whatever may be the fate which awaits the methods I have endeavored to introduce for the treatment of saccharine substances (matieres sucrees), I am confident that all the observations which are my own, will be found correct, and that a knowledge of them will give rise to useful reflections on the part of sugar manufacturers, and no doubt to new practical applications, in the various operations they have occasion to perform.

It is a well authenticated fact that in sound Sugar Cane, as well as in the sound Beet root, there exists no other sugar but what is cristallizable. It is well known too, that it is easily extracted by means of weak alcohol, which dissolves it, and subsequently upon evaporation deposits it in the form of pure and colorless crystals.

In bitter almonds also there exists a crystallizable substance "amygdaline" which can be extracted by alchol, and remains crystallized and unchanged after the evaporation of that medium. But this is no longer the case when water is used instead of alcohol. The amygdaline of almonds disappears and becomes changed, and forms by a new arrangement of its elements numerous substances entirely new and different. For water to produce this result, it is necessary to let it be in contact with the air, it must also find and dissolve certain fermenting substances contained in the tissue of the almond, as well as the amygdaline. In the sugar cane, and in the beet these fermenting substances also exist in sufficient quantities to moderate the transformation of the sugar into other products. For their action to be extended it is requisite that they be brought in contact with the sugar, by the means of water, and that they be exposed to the influence of the air.

Every one knows with what rapidity the sap of the sugar cane changes in those hot regions where it is grown, and although that change goes on with less rapidity in the juice of the beet root, it is enough so to have led to endeavors to find methods to render its manufacture more and more speedy, in order to avoid this cause of trouble and loss. For a chemist who is making an analysis, the problem of the extraction of sugar is resolved by the use of alcohol; by that he separates the sugar from its *matrices;* he changes the nature of the latter, without altering the former and places the sugar beyond the reach of destructive influences. But if he is going to undertake a manufacturing operation, he must have recourse to a cheaper medium, and one easily managed. Now alcohol is expensive and requires infinite precautions in its use if you wish to escape the frightful risks of explosion or conflagration which attend it. The use of alcohol discarded, it is beyond the power of chemistry to discover a liquid endowed with the essential properties which characterise it in this case, which like it will prevent any fermentation from taking place even in contact with the air? I think not. I am very far even from believing that the process at which I have arrived, after so long groping in the dark, is the best, even though it should prove to be the only one that can be used to advantage. The cells of the tissue or a cane contain sugar dissolved in water, and there, as is well known the sugar keeps a long time. If water could be used as a dissolvent without destroying the conditions brought about already by nature, the sugar might be extracted unaltered. The difficulties which are met with there, do not belong to the sugar nor the water, but rather to the air, and to the fermenting substances which its contact developes. This point established, can canes be crushed or beets rasped in vacuum: the juice be extracted and transported to boilers either for defection or evaporation in a continued vaccuum? If this were practicable on a large scale, the problem might perhaps be resolved. But when it is considered that an almost imperceptible breath of air is enough to create fermentation, it may at once be perceived that it is impossible to put such a system into practice. I have not attempted it. But it appeared more easy to arrive at the result by operating in an inert gas, such as the carbonic acid, by rasping the beets in the carbonic acid, and then washing them in water charged with acid carbonate of lime, or acid carbonate of magnesia. My trials did not succeed as well as they promised. The slightest traces of air produced fermentation, and these various agents only replaced without annulling them; their efficacy always proved very doubtful.

I will cite, merely by way of note, a class of agents to which recourse is frequently had to prevent fermentation. These are the metallic oxides, capable of combining with fermenting substances or matters which produce them, and forming insoluble compounds. The oxide of mercury, and the oxide of lead are of this class. In an analysis in the laboratory, the subacetate of lead is easily used and with effect, for it precipitates all fermenting substances, and all matters that create them, and leaves the sugar dissolved. But the fatal consequences of its use in sugar manufactuies are easily to be foreseen, and I know they are but too surely realized, as often as the application of it is attempted, that I can allow myself to believe that the subacetate of lead can ever become the basis of a process for extracting sugar. This is not the case with tannin, or with monohydrated phosphoric acid. These two agents coagulate the fermenting principles, and precepitate the matters which form them, and purify in its cold state the sap or juice of the beet, in a manner which renders their application possible.

However I thought I should better arrive at a process applicable to extensive operations, if I sought to discover, 1st. By preventing fermentation during the extraction of the juice, by avoiding the intervention of air so long as the juices are cold. 2nd. Availing myself of the coagulation which heat produces in the substances which create fermentation by eliminating them, as is done in defecations.

In pursuance of this I applied myself to discover a body greedy of oxygen, without action on sugar, not injurious to man, of a low price, and easily produced everywhere or transported. Three of these bodies particularly fixed my attention, the bi-oxide of azote, sulphurous acid, and aldehyde. This remarkable class of compounds greedy of oxygen, while they absorb a third, with ease and energy to produce acids, generally seemed to me eminently suitable to fulfil one of the conditions of the question, their presence forbidding the intervention of the air, prevents the production of fermentation. More skilful hands than mine will some day discover how to give a practical form to bi-oxide of azote: for I cannot believe that a substance which destroys instantaneously oxygen, as fast as it presents itself, and which forms with it an acid which precipitates fermenting substances, and matters which give rise to them, is not destined to perform a prominent part in the extraction of sugar.—Dissolved in sulphate of iron, it will preserve the juice from all alteration until after its defection by time; this finished, the juice retains scarcely anything of the reactive agents employed. Aldehyde, and the organic substances which resemble it, are too expensive; I have not therefore paid attention to them. While I was experimenting with the management of the processes, a very summary notice of which I have just sketched, I found my mind constantly attracted to sulphurous acid; its efficacy as a preventive of all fermentation, is so well established its price is so low, its production so easy, and the materials which produce it so widely diffused! It is true that sulphurous acid which succeeded so well in the hands of Proust when he undertook to prevent the fermentation of grape sugar, has always presented insurmountable obstacles to its use in manufacturies of beet sugar. I am fully aware that the most skilful men have attempted its use, and have failed, and nothing available has resulted from their labors. If sulphurous acid can be used to profit in the must of grapes; if it prevents its fermentation, while it completely respects the sugar in it, it is because it possesses the property both of preventing the production of fermentation, and of leaving intact the grape sugar, either by itself or where it has been converted into sulphuric acid by the action of the air.

Everybody knows on the contrary that cane sugar is metamorphosed into grape sugar by acids, and especially by sulphuric acids. Thus while "mutisme," by means of sulphuric acid, is applied with certainty to the must of grapes, so it is inapplicable to the sap or juice of the beet. Reflecting on this difficulty, I asked myself if sulphurous acid, employed in presence of a powerful base, such as potash, soda or lime, would not be protected from this inconvenience.—In reality the base seizing on the sulphuric acid as fast as it was produced, the cane sugar, exempt from its action would remain intact. From this I was led to make numerous experiments, easily repeated, but not worth reporting here in their details, and which I now recapitulate in a few words.

A solution of sulphurous acid, added to a solution of sugar of cane liquor, and of beet sugar, prevented fermentation, but slowly destroyed the sugar when left cold exposed to the action of the atmosphere, but destroyed it rapidly, when the liquor was heated in contact with the air.

The neutral sulphites of potash, soda and lime, prevent fermentation, with different conditions, if the liquors are neutral, but respect the sugar both when they are cold and hot. I could therefore use neither of these products.

The acid sulphites, and more especially the bi-sulphite of lime, on the contrary, have afforded me very interesting properties.—The excess of sulphurous acid which forms a part of it, prevents any fermentation the base which contains them, neutralizes sulphurous acid as fast as it is generated. It remains to be seen if of themselves, or by their excess of sulphurous acid, they have or not, the power of converting cane sugar strictly, so called, into grape sugar.

I heated for several hours, small quantities of sugar candy dissolved in water, with large quantities of bi-sulphite of lime. The sugar was changed, it became uncrystallized and deliquescent. The syrup which it formed frequently presented a character well understood by sugar makers: when submitted to the action of heat to evaporate it, it remained immoveable. Then there were quantities to be ascertained, and methods of application to follow; but as it requires a great deal of sulphite of lime to destroy fermentation, I felt bound not to abandon this agent without farther investigation.

Sugar candy dissolved in cold water charged with bi-sulphite of lime, even in great excess crystallized entirely, and without alteration, by spontaneous evaporation, at a low temperature. Cold processes would therefore be practicable in all cases, and farther on it will be seen that this assertion is well sustained.

To perfectly white sugar candy, dissolved in ten times its weight of water, was added one half its weight of bi-sulphite of lime, at ten degrees of Baumé and boiled for about an hour The turbid liquor was filtered to separate the neutral sulphite which it had deposited, and then poured on a plate, where it crystallized entirely, without the least trace of molasses, but leaving a slight precipitate of tartrate of copper, dissolved in potash.

Straw-colored sugar candy treated in the same way gave the same result; only it gave crystals of a brighter color than the candy. This experiment repeated with sugars of all kinds, gave the same results either by leaving the liquors to evaporate in their acid state, or when they were carefully neutralized after ebullition. I varied these experiments, which always had for a starting point the ebullition of sugar dissolved with an excess of bi-sulphate of lime in water, and concluding by a simple evaporation preceded by filtration: in all cases the sugar has all crystallized easily, and without any signs of molasses.

I examined by means of the apparatus of polarization, after the method adopted by M. Clerget, the sugars proceeding from the various processes, and I found *first*, that the crystallized masses gave a direct notation almost exactly identical with that which they offered after inversion, the difference in either case being compounded with the errors of observation, indicated a transformation of sugar, in every case, particularly insignificant or none at all: *second*, that the portions still liquid, where the dissolved sugar ought to have concentrated, taken from many samples after crystallization was almost complete, possesses the optic qualities of cane sugar strictly, so called, deflecting to the right the plane of polarization, and giving a direct notation almost identical with that observed after inversion. Consequently whether in its crystallized state, or in the concentrated products of the final syrups, the sugar which has been submitted to the action of bi-sulphite of lime, when the dose is not too large, nor the action of heat continued too long, behaves exactly as if it had been dissolved in pure water, and then submitted to the same tests. I had a right to expect then that bi-sulphate of lime, used as a body greedy of oxygen, and as an antiseptic, would operate without any pernicious influence on the sugar if it were applied cold to the beet raspings or ground canes, in such a way as to mingle immediately with the juice at the very moment each cell containing it is ruptured. I had reason to expect that in its presence, the sugar would undergo the action of heat, necessary for defecation without detriment. In this operation supposing it to be conducted like the previous ones, the lime employed would cause the bi-sulphate to disappear by neutralizing it: would leave the juice purified of all fermentation, and all matters capable of producing them, and prepared for evaporation without any loss of sugar. But I soon perceived that the bi-sulphite of lime was endowed with peculiar qualities, which brought it to my attention in a new aspect. White of egg—blood—yolk of egg in emulsion—milk stirred into water, and mixed with bi-sulphite of lime, coagulate entirely at 100 degrees. The liquids filtrated and submitted to evaporation gave a residuum in which I could detect very minute portions only of azotic matters, mixed with the sugar of milk, or the salts peculiar to those matters. To its antiseptic properties then and to its faculty of absorbing oxygen gas from the atmosphere, bi-sulphite of lime unites the character of a thorough defeating agent. I felt bound then to examine it in this point of view.

I mixed 50 grammes sugar candy, 250 cubic centimetres milk, 250 cubic centimeteres water and 50 cubic centimetres of a solution of bi-sulphate of lime at 10 degrees Baumé. I boiled it, I filtered it to separate the coagulum. The concentrated liquor gave upon crystallization, a perfectly crystallized mass, which examined without desiccation and without purification, in its crude state, gave 92 parts of sugar by direct notation, and 93—5 after inversion by hydrochloric acid. The defecation had been easy and complete. The sugar was preserved perfectly intact. The water adhering to the crystals, the salts of milk united with the sugar in the residuum, explains why in 100 parts residuum there were only found about 92 of sugar.

In another experiment I used 50 grammes sugar candy, half of the yolk of an egg mixed, 25 cubic centimetres milk, 75 cubic centimetres of a solution of bi-sulphate lime, 450 cubic centimetres of water. This mixture boiled and filtered gave a liquid which crystallized without any perceptible production of molasses. The apparatus of polarization indicated 85.5 parts of sugar by direct notation and 88 parts after inversion.—Therefore there was nothing there but cane sugar except the 12 0-0 representing the hygrometric water, excess of sulphites, salts of milk &c. Bi-sulphite of lime at a temperature of 100 degrees, acts then as a defecator, it separates albumen, caseum, and as will be shown, all azotic matters of an analogous nature which exist naturally in the beet root and sugar cane. It effects this separation without any loss or transformation of sugar, other than what may be estimated at one or two per cent. of the whole mass, and which cannot be computed in experiments of this kind. It remained to account for the part the bi-sulphite of lime plays as a preventive of colorization in sugary liquids. The color in sugary liquids furnished by the beet or the cane, arise from four principal causes:—

1st. These matters contain coloring substances dissolved in their juices:

2nd. The contact of the pulps with the air rapidly generates new coloring matters, which unite with the former:

3rd. The heat employed in evaporation by changing a portion of the sugar, or substances combined with it also forms coloring matters:

4th. The contact of the atmosphere with the lime as well as ammonia assisted by the action of heat, also produces them, during the evaporation of juices alkalized by time.

The bi-sulphite of lime discolors almost instantaneously, and very completely the coloring matters which exist ready formed in the cane and the beet; it prevents the formation of coloring matters, which the air produces by its contact with their pulps: it also prevents the production of those which are generated during evaporation, and especially those which require for their formation the concurrence of the air with a free alkali.—The discoloring power of bi-sulphite of lime so far as concerns the colors peculiar to the cane or a colorless combination, which is brought about at first between the color peculiar to the cane or the beet, is not absolute. It appears to depend on a colorless combination, which is brought about at first between the color peculiar to these vegetables and sulphuric acid. This effect is well known to chemists. This when there is any appreciable quantity of green matter in the canes or roots operated on, the juice at first colorless from the action of the lime, is seen to become slightly tinged by concentration, and colorless again when "boiled to the point" (arrivé à la cuite). The effect produced by the bi-sulphite of lime, as an agent to prevent the colorization of the pulps is on the contrary so complete and so durable that one is never tired of contemplating its operation. I have preserved for six months in vessels loosely closed pulps of beets, which have remained constantly colorless from the effect of the bi-sulphite of lime, while it is well known that they are deeply browned in a very few minutes by the action of the air in their ordinary condition. I have no hesitation in affirming that there are many cases where the bi-sulphite of lime may be employed in the most effectual manner to prevent the formation of coloring matters, which it costs so much trouble to destroy or extract: such for example are those which stain the filaments of hemp and flax after rotting, indigo after its precipitation, the liquor of barks used in tanning, the extracts of certain dye-woods, &c. But all the points will be examined hereafter. For the moment, I confine myself to stating that the coloring matters which are produced spontaneously in cold pulps by exposure to the air, never appear in the presence of bi-sulphite of lime. I add, that by cold evaporation, 1st. Of a saccharine liquid formed by dissolving cane sugar in water: 2nd. juice of sugar cane: 3d. juice of beets: in presence of bi-sulphite of lime no coloration ever takes place. I add farther, that on evaporation by heat, in the same circumstances, of the same substances, coloration is barely preceptible, and with the red beets the decoloration is complete, and the sugar obtained is perfectly white. I have never known any coloration worth remarking except in cases purely exceptionable, and even in such cases as those, there is produced mere traces of coloring matter whose presence would be of little consequence in the working of a sugar estate. Thus the bi-sulphite of lime may be used to advantage in operations which have for their object the extraction of cane sugar or beet sugar:

1st. As an antiseptic substance "par excellence," preventing the production and action of all fermentation.

2nd. As a substance greedy of oxygen, capable of preventing the changes which its presence produces in the juices.

3d. As a defecating substance which at a temperature of 100 degrees clarifies the juices and purifies them of all albuminous or ceagulable matters.*

4th. As a discoloring substance for the colors preexisting.

5th. As an anti-coloring body capable in the highest degree of preventing the formation of coloring matters.

6th. As a substance capable of neutralising all injurious acids which may exist, or be generated in the juices, and substituting for them an acid almost inert; the sulphurous acid.

It remains to be ascertained in what quantities and in what form the bi-sulphite of lime should be applied to the cane or the beet; what new conditions would result from its use on a large scale, what difficulties might counterbalance the advantages it seems to promise. This is what I am now going to investigate, relying on my experiments without exaggeration, but at the same time confidently, endeavoring to take into consideration the present and the future. Why should I not avow it? One of the thoughts which has most powerfully sustained and stimulated me in the course of my researches, has been the hope that, in the equatorial regions at least, the extraction of the sugar might be obtained by the employment of the heat of the sun alone. Once rendered inalterable indeed, what is there to prevent the juice of the sugar cane from being abandoned to the slow crystallization like salt in the salt pans? Nothing, I am bold to say, and I call as witnesses on all those who have followed my experiments: they have always been of my opinion. This opinion, this desire, will explain why the experiments of which I am about to speak, have received the direction which I have given them. It is known that there exist in Marcia, establishments which make sugar from the cane. They have resisted all vicissitudes which have taken place in the sugar trade for the last sixty years: they are still in full activity. It is from there, through the kindness of a friend, who has never ceased to protect my scientific career, that I procured several hundred pounds of fresh sugar canes for my experiments. They arrived at Paris in good condition, and were taken to the laboratory of the Sorbonne, where I experimented on them. Submitted to the inspection of persons who having resided in the colonies, could give an exact opinion, they pronounced them not perfectly ripe. Many of them were soured. Their working did not promise a satisfactory result. However the first trial I made, filled with astonishment those persons accustomed to the operations of making sugar from the cane, and experienced judges of its products. The juice was extracted from coarse raspings, with an addition of bi-sulphite of lime. It was defecated by boiling, and then simply strained through a cloth. The syrup concentrated, filtered a second time, was left to slow crystallization. This was accomplished almost to perfect dryness. An analysis made with alcohol, could not have succeeded better, both as to the nature of the sugar and its quality. That which I obtained was less colored. In these circumstances the whole of the sugar contained in the juice takes a solid and crystallized form. The crystals are large and strong. They are no darker than common sugar candy, which they resemble. They contain only traces of altered sugar which are not preceptible. Taking into account the almost absolute purity of cane juice, which consists really of sugar dissolved in water, and taking into account the peculiar propensity of cane sugar to form into large crystals, an aptitude which beet sugar has never manifested to me in the same degree;

* NOTE. There remains however in the juices defecated in this way, a peculiar matter which becomes colored under the influence of the air, or of alkalies, at first of a violet, and finally brown, it is possible it may be of an azotic nature.