(For the Scientific American.)

Sisal Hemp.

[Concluded from page 211.]

The leaves of the *Maguey* vary in length from two to six feet, and are from three to five inches wide; they are frequently three and four inches thick at the butt. The fibers lay embedded in a soft gummy pulp the whole length of the leaf, they being straight and parallel. The entire pulp of the leaf, epidermis and all, when dry, after the gum is washed out, is nothing more than a powder. This is a most important fact in connection with cleaning the fiber, and must be borne in mind in contriving any machine for the purpose. In Yucatan they get out this hemp by the simple and primitive manner of beating the leaf on a block with a club or mallet, and afterwards scraping it on a bench or a smooth log or pole, with one end on the ground and the other breast high. They use a narrow piece of board with a triangular notch in the end, which is brought to an edge, and held nearly perpendicular when used. The leaf is laid on the pole, held with one hand, and scraped with the other. This would seem a very awkward way, more so even than when a bench is used, when the leaf is held by the breast, and is scraped something after the manner that leather is curried, the operator having either a long piece of triangular hard wood or a piece of thin iron with a handle at each end, and using both hands to scrape the fibers; either plan is tedious and inefficient. In order to get rid of the gum more readily, they generally soak the beaten leaves either in water or in mud till they ferment; but from the nature of the gum—which I think has both starch and azote in it—even a small amount of fermentation both stain and weaken the fibers, although it materially facilitates the cleaning of them. Such is the difference of the value of these fibers got out by the two processes of fermenting the leaves before scraping and the one of beating and scraping the leaves at once, before fermentation takes place, that I see in the London market that fibers out of an Agave like this Sisal hemp, are worth but £12 per tun when they have been soaked in water or mud; yet the same fibers are worth £50 per tun when got out before fermenting by the aid of fair water alone. It would seem that this difference in the price of the fiber will warrant a good deal of labor and expensive machinery to get out the article in the better state.

I am firm in the belief that the best plan to clean this hemp will be found to be, to pass the leaves through a series of rollers made of iron and set in an iron frame so that they would be entirely unyielding. The first set, perhaps, it would be well to have corrugated, the better to crush the leaf; but the rest, I think, should not only be turned as true as tools could do it, but should be polished and kept perfectly clean while in use, so that nothing but the fiber and pulp should interpose between them. These rollers should be from 14 to 18 inches in diameter, and should be driven by a motor of from 10 to 20-horse power, according to the number of rollers it was found necessary to perform the work well, and according to the amount of work required to be done; that is, if 4 or 6 rollers were found insufficient to clean the fiber well, let the double of those numbers be used. The leaves could be fed into the first set, and while passing from set to set water could be thrown on to them between the rollers, in jets or otherwise, in sufficient quantity to wash out the gum Thus treated, if it be beaten after being dried, I think it would be ready to bale for market without scraping or combing. But even in a machine such as is here indicated, an inven tion is required, to have the fibers fed forward with the least possible manual labor, likewise to have them kept parallel and from tangling, yet so spread that but a single layer of fibers should pass through one or two of the last sets of rollers at a time.

By any system of crushing the leaves and afterwards scraping or combing the fibers clean that I can conceive of, in addition to the increase of labor and the number of times that the article would have to be handled, the process must break and render nearly useless from one-eighth to one-quarter of the fibers, whereas, by the plan I have hinted at, if the fibers are kept from tangling, the loss would be nothing, and they would be in a perfect state to spin into rope yarns, &c., without combing at all. Nor can I think this will be difficult, for, as before stated, the fibers are continuous and parallel in the pulp of the leaf.

There have been some attempts here to improve the process of getting out this hemp, by first crushing in a simple pair of rollers, and afterwards steeping in alkaline pickle and combing, which is, undoubtedly, an improvement over the primitive Yucatan method; yet this plan destroys the soft silky gloss that this hemp possesses when got out from the fresh leaves by the aid of fair water alone. From the juice of the leaf being acid, perhaps the alkaline pickle does not materially injure the strength of the fiber, yet it does certainly destroy the gloss; besides, it increases the expense without benefit.

To close this part of the subject I will add, that where the business is pursued on a large scale, the expense of the machinery, or the amount of motive power required, should be, and really is, a subordinate matter to the amount of manual labor, which should be reduced to the least possible quantity. For those who carry on the business on a small scale, a less expensive plan, even if less perfect, would be desirable.

If any person should wish to test any machine that they may contrive, who lives near the large cities of the seaboard, I will with pleasure send by steamer when opportunity offers, a cart-load, or such an amount, of leaves for the purpose. The California steamers from St. John frequently stop here, and although they may not wish to take it as freight, I dare say they would take it as an accommodation if the Agent was consulted. I speak of steamers, because the leaves would wilt too much in the time it would take sailing vessels to carry them to any considerable distance; after they arrive they should be kept cool and damp, that they may remain as green and fresh as possible.

Any one wishing leaves for such a purpose, by informing me by letter, directed to Key West, Fla., what steamer will carry them, they shall be placed on board free of expense; likewise any further information that I can give will be cheerfully rendered, by application to me by mail. W. C. Dennis.

P. S. There is an article in the agricultural part of the Patent Office Report for 1854 from an East India paper on the subject of cleaning the fibers of such plants as Sisal hemp, which inventors should consult.

Curing Meats.

Messrs. Editors—On page 90, this volume Scientific American, a method of preparing hams of pork and beef is described. My teacher—"experience"—has taught me a different mode, or rather, the time of applying the salt. In Ireland, where the air is said to be very pure, and the temperature low, meat is suffered to cool until the life heat is all gone, and the meat stiff. When the muscle of killed flesh relaxes its rigidity, it is a sign that decomposition has taken place. Animal substances undergo various fermentations just like vegetable substances; the grand object of saving meat to perfection, is the preventing it passing from saccharine fermentation. On this continent I have cured meat in the Canadas—East and West,—New Brunswick; in the Eastern, Middle, and Western States, and in most of the U. S. Territories. I have also cured fish in various climates in *three* zones, in all seasons, and have "carried the bell" from both fishers and hunters. Well, your mode of curing beef hams is good. I have eaten beef killed in Liverpool in May, and in Montreal (Canada.) in August, rolled up and dusted with red pepper, covered with canvas, and then corded. I have killed venison in June, in Iowa, cut out the bones as quick as possible, heated up salt, and applied sufficient to season the meat, then submitted it to a press to squeeze out the brine and fluids, and thus have cured it. I have treated every kind of meat eaten by the Western farmer and hunter in this manner, with perfect success. In thirty years I have not lost a pound of meat by its being spoiled or tainted. I have the utmost aversion to tainted meat. Butchers frequently allow meat to become tainted—partly decomposed—then they use a great deal of salt and niter to saturate it and prevent further decomposition. Meat so treated becomes perfectly indigestible.

A few hours is sufficient time to salt meat, and three hours are enough for salting fish. The salt must be deprived of all its water, excepting that of crystalization. It is a very good plan to surround salted meat with charcoal.

The following is my rule for curing meat. As soon as the animal is deprived of life, cut it into suitable pieces, extract all the bones, or cut open the joints, and wipe all the watery matter found in the joints; put on the salt as hot as can be borne by hand, rubbing it into the pores; then put it into a press to extract the brine, then change the position every six hours, applying a little salt until it is perfectly salted. It may be afterwards dried for transportation or kept for use, or, instead of drying, it may be packed in charcoal. "Nothing beats trying." J. A. H.

The Rays of the Sun.

Messrs. Editors—According to the statement of "Perdex," on page 162, this volume of the Scientific American, it requires more pressure of atmosphere than seven pounds to the square inch to separate caloric from the rays of the sun.

It is supposed by many philosophers of the present age, that the moon has no atmosphere. It is well known that the light from the moon is the reflection of the rays of the sun. From experiments made many years since, I found that however highly the light from the moon might be concentrated, it did not contain sufficient caloric to affect the most sensitive thermometer. The colorific and decomposing rays were reflected, but no caloric.

I must conclude, therefore, that the moon has an atmosphere of sufficient density to separate caloric from the rays of the sun.

When I mention the rays of the sun, I refer to the mass of light we receive from that luminary. Sun light is not homogeneous, being a triple compound of colorific rays, calorific and decomposing rays. As each of these properties in light vary in their degree of refrangibility, they become separated in passing through a prism, and can be seen or tested. The calorific portion is less refrangible than the others, the red ray containing a portion, but outside of the red ray, where there is no light, is found the greater portion of caloric. Each of the other colored rays are more refrangible than the red, the violet being the most so. The decomposing rays are the most refrangible of all, some being found in the violet, but outside of it, where there is no light, the greater portion is concentrated. The calorific portion being separated and diffused by refraction, warms the surface of our planet, and causes the formation and growth of all our organisms. The colorific rays beautifies its surface, and the decomposing portion reduces organisms to their original elements when their organic power ceases to supply material for a re-formation of others. Infinite wisdom is displayed in this arrangement, infinite power in its execution and infinite benevolence in its adaptations.

Wm. Partridge.

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Coal and Wood as Fuel.

Wood generates heat more rapidly than coal; but a pound of the latter (anthracite) will evaporate three times more water than a pound of wood. As a compact fuel, coal, therefore, is the best for use in generating steam, because plenty of draft for rapid combustion can easily be obtained by a blower or a tall chimney.

As wood contains a great quantity of oxygen and anthracite coal none, less air is taken from an apartment when wood is used for fuel than when anthracite coal is used. This is the reason why the atmosphere of apartments heated with wood fuel produces, as it were, a more genial influence, and why such fuel is also more healthy for heating; also why it does not require such an amount of cold air from the outside to supply the fire.

Alloy for Composition Files.

The following is given by Prof. A. Vogel in the *Neues Jahrbuch fur Pharm*, as being the composition of those delicate files made in Paris and principally used by watchmakers for polishing steel pins, and for the production of the deep polish of some parts of watches—the alloy is of silvery whiteness. The analysis of a file of this description of 6 inches in length and 5 lines in breadth, made of a yellowish-white metal, which was very brittle under the hammer, and had a jagged fracture, gave—

Copper . . .	64·4, or 8 parts.
Tin	17·6, or 2 parts.
Zinc	8·0, or 1 part.
Lead	8·6, or 1 part.

The author then melted the four metals together under a coat of borax in the above simple proportions. The alloy filled the clay mold well. It is so brittle that it can scarcely be worked with the file; the rods of metal are, therefore, best ground on a grindstone, to give them the surfaces required for each particular case. The alloy above mentioned gives files of as good quality as that employed for analysis. It has, probably, been obtained empirically by trials. The author has found that inconsiderable changes in the proportions of the metals exert a great influence upon the usefulness of the alloy.

Perfumery.

The extensive flower farms in the neighborhood of Nice, Grasse, Montpelier, and Cannes, in France, at Adrianople, (Turkey in Europe,) at Broussa and Uslak, (Turkey in Asia,) and at Mitcham, in England, in a measure, indicates the commercial importance of that branch of chemistry called perfumery.

British India and Europe consumes annually, at the very lowest estimate, 150,000 gallons of perfumed spirits, under various titles, such as eau de Cologne, essence of lavender, esprit de rose, &c. The art of perfumery does not, however, confine itself to the production of scents for the handkerchief and bath, but extends to imparting odor to inodorous bodies, such as soap, oil, starch, and grease, which are consumed at the toilette of fashion. Some idea of the importance of this art to commerce may be formed when we state that one of the large perfumers of Grasse and Paris employ annually 80,000 lbs. of orange flowers, 60,000 lbs. of cassia flowers, 54,000 lbs. of rose leaves, 32,000 lbs. of jasmine blossoms, 32,000 lbs. of violets, 20,000 lbs. of tubereuse, 16,000 lbs. of lilac, besides rosemary, mint, lemon, citron, thyme, and other odorous plants in like proportion. The quantity of odoriferous substances used in this way is far beyond the conception of those even used to abstract statistics, giving rise to an amount of industry truly gratifying.

The consumption of perfumery increases with the civilized state of society—it is strictly one of the arts of peace; it supplies one of our senses with a gratification, which, by use, becomes tutored to distinguish everything that is sweet to smell, and this art is certainly calculated to stamp the refinement of taste to one of our desires—the desire of pleasing the olfactory nerve.

To the chemical philosopher, the study of perfumery opens a book as yet unread; the practical perfumer, on his laboratory shelves, exhibits many rare essential oils, such as essential oil of the flower of the acacia farnesiana, essential oil of violets, tubereuse, jasmine, and others, the compositions of which have yet to be determined.

The exquisite pleasure derived from smelling fragrant flowers would almost instinctively induce man to attempt to separate the odoriferous principle from them, so as to have the perfume when the season denies the flowers; and thus we find the alchemists of old torturing the plants in every way their invention could devise for this end. Their experiments were not wholly unsuccessful; indeed, upon their foundation the whole art of perfumery has been reared, which observation applies to numerous other useful manufactures. Without recapitulating those facts which may be found diffused through nearly all the old authors on medical botany, chemistry, pharmacy, and works of this character, from the time of Paracelsus to Celnart, we may state at once the mode of operation adopted by the practical perfumer of the present day for preparing the various extracts or essences, waters, oils, pomades, &c., used in his calling. The processes are divided into four distinct operations.

Septimus Piesse.