Improvement in the Manufacture of Ultramarine.

R. W. E. McIvor has found the following proportions of raw materials to yield excellent results: Sodium sulphide, 42 lb.; sulphur, 20 lb.; kaolin (China clay), 110 lb.; soda (as carbonate), 106 lb.; or caustic soda, 40 lb. These quantities yield about 2 cwt. of ultramarine blue. The clay and soda are first roasted together at a red heat so as to effect partial double decomposition, and the product is ground. "Sulphur liquor" is then made by dissolving flowers of sulphur in a solution of sulphide of sodium to saturation. The ground material is then made into a thick paste with the sulphur liquor, the paste dried in an oven, and the dried mass broken into small pieces is roasted without access of air in a closed earthenware retort first at 250° to 300° C. for an hour, then at a red heat for eight hours, and finally just below dull redness in presence of a slow regulated current of air. The retort must be quite cold before being opened.

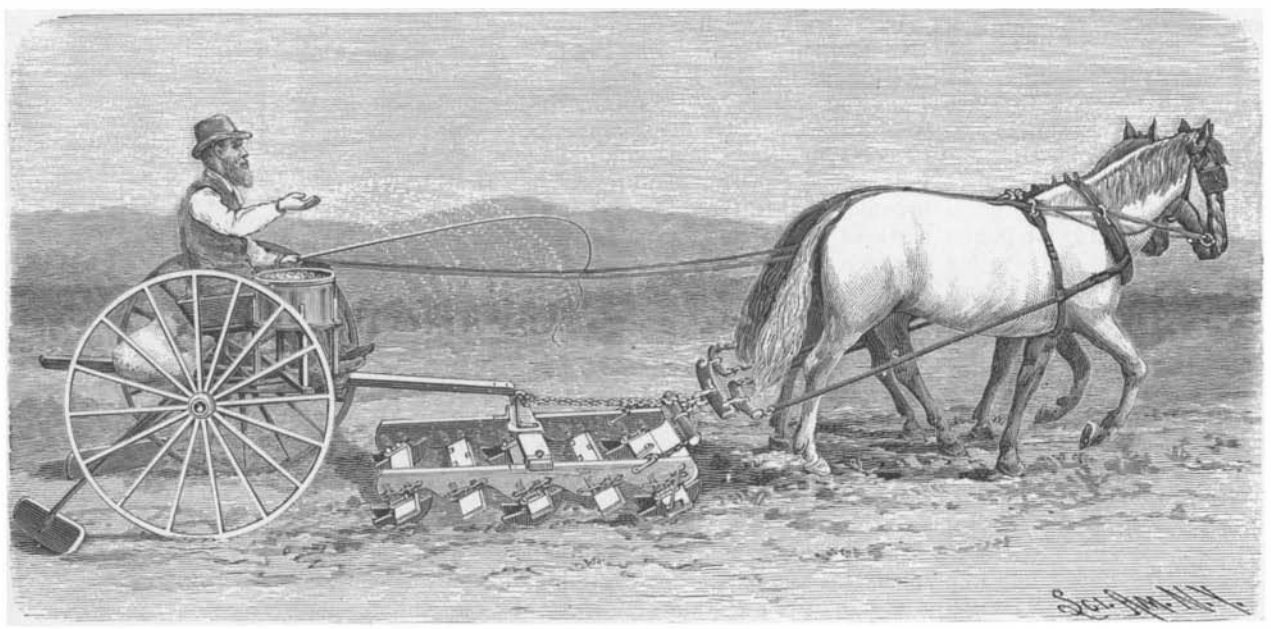
Sugar.

The States now producing sugar and the raw material from which they produce such sugar are as follows:

California	Beets.
Utah	Beets.
Nebraska	Beets.
Pennsylvania	Beets and maple sap.
Virginia	Beets.
Texas	Sugar cane.
Louisiana	Sugar cane.
Florida	Sugar cane.
Kansas	Sorghum.
Missouri	Sorghum.
Minnesota	Sorghum and maple sap.
Michigan	Sorghum and maple sap.
Iowa	Maple sap.
Wisconsin	Maple sap.
Illinois	Maple sap.
Ohio	Maple sap.
West Virginia	Maple sap.
New York	Maple sap.
Maryland	Maple sap.
Massachusetts	Maple sap.
Vermont	Maple sap.
New Hampshire	Maple sap.
Maine	Maple sap.

A PULVERIZING HARROW AND CULTIVATOR.

The improvement shown in the illustration is designed to form a perfect pulverizer, doing the work of a harrow clod crusher and roller combined, while it prepares a perfect seed bed, deep, fine, smooth, and even as a floor, and cleans foul fields of weeds and vines so that they may be plowed under without trouble, the plow not being required at all in many cases. The forward frame of the machine, which carries the pulverizers, is connected by a pole with the axle of a wheeled carriage, and the frame has a series of inclined drag bars, adapting it, when the pulverizer blades are removed, to the smoothing of lawns, roadbeds, etc. The pulverizer blades are preferably of steel, and are attached to a head stock, as shown in the small views, two upwardly extending studs of the stock passing through perforations in the drag bars, to which they are secured by pins or keys. One of the paired cutter blades crosses the path of the other, and presents an acute angle to the ground surface, designed to cut through it readily, and ride upon or cut off small roots, vines, stalks, or similar obstructions, or bury them in the soil, while the shape of the blades is such that the entire device will ride over a rigid obstacle. The edges of the blades are beveled on the outside, to render them self-sharpening as they are drawn through the soil. Extending rearwardly from the wheeled carriage are rods carrying drags, by which the marks made by the wheels are covered. The machine can be taken apart and put together, or changed from one combination to another, without the use of a tool or the exercise of any degree of mechanical skill. It is designed to be inexpensive to manufacture, and not likely to get out of order with severe use, while it can be readily taken apart and packed, except the wheels, in a box about six feet long by ten inches square.

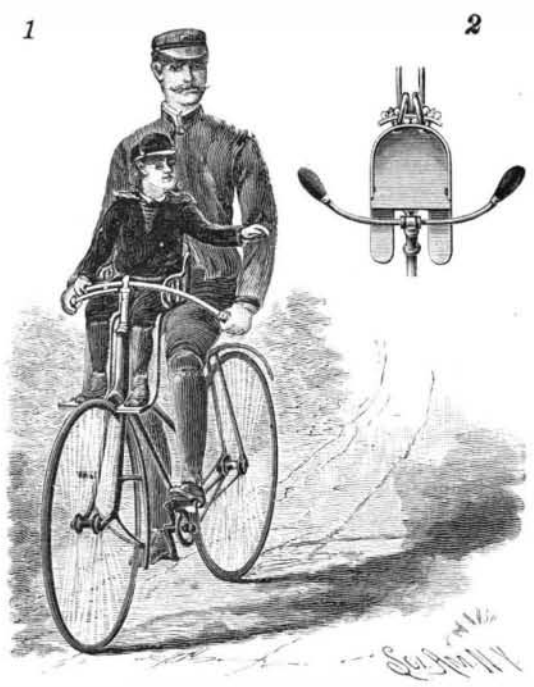


L'HOMEDIEU'S CULTIVATOR AND PULVERIZING ATTACHMENT FOR HARROWS.

This improvement forms the subject of two patents issued to Mr. John P. L'Homedieu, of Setauket, Suffolk County, N. Y., to whom application may be made for further particulars.

A SEAT ATTACHMENT FOR BICYCLES.

The illustration represents an extra seat attachment for bicycles, which may be readily put on or removed, adapting the vehicle to hold a child in front of the rider in such a manner that it cannot fall out and will not unbalance the machine, while it may also be adjusted to suit children of different sizes. This improvement has been patented by Messrs. Louis Rastetter and Crist Siebold, of Fort Wayne, Ind. The child's seat may be placed on any common form of bicycle, being shown attached to a safety of the usual style, and it is supported at the back by the spring of the main seat, a cleat passed through the front coil of the spring being secured to the back of the attached seat, from the lower front portion of which braces extend downward and forward, and are bolted to a support secured to the steering fork and the main frame. Fig. 2 is a plan view of the attached seat and its supports, the foot rests extending in a nearly horizontal position on each side of the fork, and the rear portions of the foot rests being bent upward and clamped to depending hangers, the clamp being adjustable to suit children of different sizes. The handle bar extends around the front of the seat, forming a secure guard to prevent the child from falling out, and when the child is not to ride the seat may be easily removed and the bicycle used in the ordinary way. By this method of attaching the seat, the child has a foot on each side of the fork, and has the same swinging motion as the operator, the weight of both coming together upon the saddle, whereby the child fully partakes in the healthfulness of this form of exercise.



RASTETTER & SIEBOLD'S BICYCLE SEAT.

The Physical Action of Odors.

The direct action of odors on the nervous centers is a subject worthy of careful research and study. Goethe had a strong dislike to the odor of apples; Schiller liked the odor. Some persons are made absolutely ill by the odor of onions that are being cooked; while other persons rather like it. The odor of the lily has a most potent effect in many instances, and I believe there is no person on whom it does not produce a sense of depression and nausea. I have known it cause positive faintness. I am myself always disagreeably affected by the odor of carbolic acid, and can never remain many minutes in a room where a trace of it prevails. In cases where the effect of an odor is instantaneous, it is fair to suppose that the impression made on the olfactory surface is transmitted direct to the olfactory center of the brain; but there must also, in certain examples, be a further transmission to the sympathetic ganglia.

The central seat of the olfactory sense must be very near to the central seat of memory, for it is noticeable that nothing recalls a past event like an odor. A little child was accidentally thrown out of a pony-carriage in a country lane. Near the spot where the fall took place there was a manure heap, which gave forth the peculiar dry ammoniacal odor so often recognizable from such heaps—an odor distinctive yet not altogether unpleasant. The child was stunned by the fall, and on recovering and returning to consciousness smelt this odor powerfully. Over fifty years have elapsed since that little mishap, and yet whenever the person referred to passes, in country lanes, a heap giving out the same odor, the whole scene of the accident recurs with every detail perfect, and sometimes with a recurrence of the giddiness and nausea which were experienced at the moment.

In some of the lower animals memory by odors is often singularly exhibited. In the dog the memory by odor seems a special part of the nature of the animal. The "scent" of the fox-hound and of the stag-hound is of this character. In the trained collie the remembrance of an object hidden, a stick, for instance, may be retained for three-quarters of an hour, so perfectly that the animal will fetch the object at command. But if the object be coated with something giving an odor which the animal is familiar with, the time is infinitely more prolonged.

Some odors lead to sleep, like the odor from dried hops; others lead to wakefulness, like the odor of dead flowers or leaves. Still others allow sleep but provoke the most terrible dreams, like the odors arising from a pillow in which feathers are decomposing.

Habit modifies the effects of odor. Merciless smokers laugh at the "faddery" of women who become faint if a smoker charges the air they breathe in a confined space, a small room or a railway carriage, and are ready to compare the objection of a lady unaccustomed to the odor from the pipe or cigar with the carelessness on the matter shown by another lady who has become accustomed to the effect. But if a smoker gives up smoking and all contact with smoke for a few years, he is astounded at the unpleasantness of an air charged with smoke when he is then inclosed in it. I was once summoned, professionally, to a youth who was temporarily poisoned by inhaling the atmosphere issuing out of a small window of a clubroom in which a number of men were smoking freely. They, in the body of the smoke, were not perceptibly affected. He, partly in the open air, was positively smitten to faintness by the empoisoned current from the room which flowed out of the window, and is still affected whenever he comes within the cloud of a pipe.—*Dr. B. W. Richardson, in the Asclepiad*

To Remove Rust.

To remove rust from iron or steel utensils the following solution is applied by means of a brush, after having removed any grease by rubbing with a clean dry cloth: 100 gm. stannic chloride are dissolved in 1 liter of water; this solution is next added to one containing 2·5 gm. tartaric acid dissolved in 1 liter of water, and, finally, added 20 c.c. indigo solution diluted with two liters of water. After allowing the solution to act for a few seconds, it is rubbed clean with first a moist cloth, later with a dry cloth; to restore the polish, use is made of silver sand and jewelers' rouge.