

THE NEEDLE AND THREAD PLANT.

The *Agave Americana*, or maguey of the Mexicans, is known as the century plant among our collections, the latter name being given to it from the erroneous idea that it bloomed once in a hundred years, and "with such rapidity as to resemble the explosion of a cannon." The period at which the plant really flowers is owing to the climate and the cultivation to which it is subjected. In warm countries twenty-five years is sufficient to bring the flower to perfection. Mr. Hawkins, in his "Transactions of the Horticultural Society," gives an account of the most remarkable instance on record of the flowering of the American aloe. Without manure or protection this plant bloomed in eighteen years, having attained a height of twenty-seven feet, and having on it forty flowering bunches, each with four hundred blossoms, making sixteen thousand flowers in all; the scape, with its panicle of rich yellow blossoms, in appearance like a candelabrum.

The vast plains in the interior of Mexico is the home of the maguey, and the plant with its thorny leaves imparts a peculiar character to the Mexican landscape.

The strange form of the plant and the rarity of its blossoms are not the only circumstances which recommend it to our attention. From the leaves, roots, and sap are obtained a variety of products. "The natives," says Obers in his "Travels in Mexico," "make as many uses of this plant as the South Sea Islanders of the cocoa palm, namely, one hundred." The juice of the sap, which is obtained by making incisions in the trunk, being highly caustic, is used by physicians in cleansing wounds. Its more extended use is that of producing a bitter-sweetish juice known as aquamiel (honey water), which furnishes to the natives a drink called pulque, and when taken in moderation is innocuous and wholesome. The foliage of the maguey yields an extract which lathers water like soap.

The agave holds the place of Asiatic hemp and Egyptian papyrus. Ancient hieroglyphics were inscribed on the leaves, macerated in water and glued together as the bark of paper mulberry. Much attention has been recently paid to the manufacture of paper from the leaves. "The fabrication of this material is destined to be a great industry, says the "Catalogue of Mexican Products," owing to the quality and cheapness of the material.

The fibers of the leaves with the thorns at the end are applied to manifold uses. The edges of the leaves are indented; at each indenture is a spine. These spines are frequently so strong as to serve the Indians for nails. A needle and thread is also furnished the natives by the simple process of pounding the leaf so as to soften the pulp, then scraping the latter away, allowing the fibers with thorns attached to remain. These are dried by hanging in the sun a few days, and the Indian woman has her needle, which is smooth, and not liable to rust; her thread to sew her coarse dress made from "petal flax" (a textile fabric of this plant), prepared in the crudest manner, yet stronger than cotton which has gone through many processes of manufacture.

A rope is made from the fiber of the maguey which is used in the mines and for the cordage of ships on the western coast. The poorer classes of Mexico thatch the roofs with the leaves, and these being concave serve as gutters to conduct the water away from the eaves. The Greek meaning of agave is "noble," and it is well named, as it is one of the most valuable gifts which nature has bestowed on these tropical regions of America. The wealth of a Mexican often consists in his maguey plantation.

New Gutta Percha Tree.

Instigated by the threatened dearth of the gutta percha tree (*Isonandra Gutta*), M. Heckel has sought a substitute, and claims to have found it in the *Birtyrospermum Parkii* (Kotschy) of equatorial Africa, and abundant in latitudes between Upper Senegal and the Nile, especially in the forests of the Niger and Nile regions. It affects the argillaceous and ferruginous soils of Bamarras Boure and Fonta-Djalon, where the Africans gather its fruit, which yields a grease called *karite*. The juice or milk is obtained by incision from the bark, and on evaporation resembles gutta percha. M. Heckel states that he has sent seeds to various French colonies, and also to England, in the hope that latter country will try the experiment of introducing the tree into her vast tropical possessions. M. Heckel also calls the attention of English botanists and chemists to the divers Indian *Bassias*, as he is led by analogy to infer that they might furnish milky products similar to the *Bassia Parkii*.

Specific Gravity of American Woods.

Of the four hundred and thirteen species of trees found in the United States, there are sixteen species whose perfectly dry wood will sink in water. The heaviest of these is the black ironwood (*Condalia ferrera*) of Southern Florida, which is more than thirty per cent heavier than water. Of the others, the best known are the lignum vitæ (*Guaiacum sanctum*) and mangrove (*Rhizophora mangle*). Another is a small oak (*Quercus grisea*), found in the mountains of Western Texas, Southern New Mexico, and Arizona, and westward to the Colorado desert, at an elevation of five thousand to ten thousand feet. All the species in which the wood is heavier than water belong to semi-tropical Florida or the arid interior Pacific region.

Plants under Trees.

We have been asked recently to name a section of plants that could be planted under trees. We could name several, such as hollies, privet, euonymus, box, berberis, etc., with something like a preference for the latter. In berberis we get a genus of shrub possessing the highest qualifications for purposes of ornament; and all the grander evergreen species do better under trees than in the open; in fact, they require to be constantly in the shade. The soil in which these thrive,

The Cutlery Manufacture.

American cutlery is now finding its way all over the world, and knives, shears, scythes, and planes of our manufacture are to be found in the warehouses of most large English cities. In 1872 the importation of cutlery into the United States amounted \$10,500,000, which was cut down in 1880 to about \$900,000 a year, besides which \$700,000 worth of domestic goods were exported in that year. In the manufacture of axes, the United States have made most marvelous advances, surpassing all other countries, except Canada, which bears an equally good reputation for making these useful implements.

Good table knives are made of steel and iron welded together; the part which goes into the handle (called technically the tang in England) and the shoulder are of iron, and the blade of steel. The tang and shoulder are forged from bar iron, and the blade from shear or cast steel. Knife blades, razor blades, and other small articles are usually forged into their required shape while still attached to the bar, which serves for the workman to hold them by. When the bar becomes too short, it is grasped in a pair of tongs held close by a ring which clamps them by sliding up their conical handles. Two men are employed in forging such work. The principal workman, or fireman, as he is sometimes called, uses a small hammer of two to four pounds weight, while the hammerman wields the sledge hammer, weighing from ten to fifteen pounds. The fireman, who attends the heating as well as the anvil work, directs the hammerman, whose blows merely follow those of the small directing hammer of the fireman. In drawing down or reducing a bar both in length and width, the flat face of the hammer is used; but when the length or breadth alone is to be extended, only the narrow edge of the hammer is used. The concavity of razor blades is made by hammering the blade on a small round-faced anvil; the notch, or nail hole, of a penknife is struck by means of a chisel of the required form. Superior work, such as razor blades, are "smithed" after forging, that is, beaten upon an anvil, to condense the metal as much as possible, and slightly ground or scorched upon a rough stone, to finish the shaping and remove the scale, or black oxidized surface, which would interfere with the color of the tempering.

Common knives are made entirely of iron, and the difference of price arises not merely from the difference in cost of the material, but from the greater facility of working. It should also be understood that, in many articles composed of steel welded to iron, the saving of steel is not the only advantage, for steel being more brittle than wrought iron, it is very desirable, in all articles subject to a transverse breaking strain or to concussion, that every part except the cutting or working edge should be of iron. Thus a hatchet made entirely of steel would be less durable than one of iron with a welded steel cutting edge, and so of other articles.

Table forks are forged rudely into the shape required, first as though but a single thick prong were required. The part for the prongs is then beaten out, and a stamping die is brought down upon it, which forms the prongs, with a thin film of steel between them; this is cut out by a cutting die. Then they are softened and filed up, again hardened and tempered and

ground to smooth and finish. The dry grinding of forks, needles, etc., is a very deleterious trade, on account of the particles of steel which enter the nostrils of the workmen, and produce most painful irritation, followed by a peculiar disease called "grinder's asthma," which is said to shorten life so seriously that few dry grinders, exposed to the steel dust, reach forty years of age. Many remedies have been proposed for this. A magnetic mouthpiece was invented; but the workmen would not wear it, on account of its novelty, its grotesque appearance, the trouble of cleaning it, and the belief that if their trade were more healthy, greater numbers would enter it, and wages be reduced. A revolving fan, which sets in motion a current of air, that is carried by a pipe to the outside of the building, has been used with greater success, and is now in general use when it can be applied, though its introduction was much opposed by the workmen.

Progress of Natural Gas.

Natural gas will soon be used as an illuminant in Kansas City, Mo., Wyandotte, Kan., and several other cities and towns near these places. The gas has been struck at several points during the last two years, and parties from the Pennsylvania oil regions have undertaken to develop its use.



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best is a deep, rich, moist, sandy loam, with abundance of water overhead and at the roots. Among the species the noblest of all is *Berberis (Mahonia) japonica*, which for magnificence of foliage has no equal among hardy shrubs. It naturally grows in the form of a dense bush, with large pinnated leaves of hard texture and of a lively green hue. Specimens of it are now covered with spikes of flower buds, which will open at the first break of spring weather, and soon be succeeded by bunches of grape-like berries, covered with a lovely bloom.

Two other noble, large-leaved species which thrive under trees are *M. Bealli* and *M. intermedia*. For warm, sheltered gardens, *M. Nepenus* is most beautiful, and *B. Fortunei* is well worth having, but both these are rather tender. One of the loveliest of flowering shrubs is *B. Darwinii*, which blooms abundantly, and of which we have had spikes of bloom sent us on Christmas day from Devonshire. One of the cheapest for common purposes, and really a beautiful species, though not equal to those already named, is *M. aquifolium*, well adapted to plant in quantity in town gardens, and to form game covers or belts for screening off the compost or rubbish yard from the kitchen garden. These are certainly the best for planting under trees.—*Land and Water.*