

SYSTEM AND CLEANLINESS IN MACHINE SHOPS.

Order and cleanliness in machine shops and manufactories may be advocated for higher reasons, and yet none is more convincing than the method which shows the economic side of the question.

What do you want? The floor covered with litter, heaps of cuttings under every lathe or machine, under every bench on the floor near each old material of all kinds have been thrown in almost inextricable confusion; the machinery is encrusted with oil and dirt, except just those parts that meet the hand in working, and the speed cones and pulleys polished by the running belts, showing what might be and is not.

The cutting tools, the bolts and plates, and other gear used in these machines, lie around their bases; a new strata seems to be fast closing over some of them. Overhead is heard the harsh grating of some loose pulley; the belts have been thrown off their shafts by some sensitive workman, who cannot bear the unpleasant noise in such cases; the belts dangle from the shafts, in the running shaft coupling a stretch on them and wearing them all the time.

A man has to drill a three-quarter inch hole in a piece of plate; the time actually required would be about five or ten minutes if good order were kept on this case. The man communicates by making a tour of the shop, for there are some drills lying around this machine, and some around that, and there is no one place where every drill not in use is sure to be found.

Another has a brass to plane; no tool for brass seems to be visible; he has probably trodden it down too deep in the thick red dust of the flooring to be distinguishable. However, he soon grinds of the top of a tool for cutting wrought iron; that is easy enough; but when that tool is wanted again to work in the material it was made for, 1-16th of an inch must be ground off its facets to restore the original angle—waste of time and steel.

If a workman should happen to drop a small pin, washer or key, he makes another, because among the debris around he knows it is as much lost as though when it fell the earth had gaped to receive it.

IMPORTANT IMPROVEMENT IN SUBMARINE TELEGRAPHY.

A Paris letter in the Boston Advertiser thus describes Tommasi's invention, which is expected to effect a revolution in the methods of ocean telegraphy: The transatlantic cable requires the use of very feeble currents, as the only means of avoiding combustion or oxidation of the wires, and this feebleness of current necessitates the use of a compass, placed perpendicularly in a dark room opposite a blackboard, upon which a strong ray of light permits the operator to follow the movements of the needle and take down the dispatches as they arrive.

JULIUS FAUNA.—Dr. Hart shows in a recent publication that along the shores of the Amoor, in Siberia, is the finest development known of Jurassic plants, amounting to 85 species. Like those from Yorkshire and Spitzbergen, the conifers, Salsolias, and tropical forms predominate. Of existing forms we recognize Asplenium, Thyrsopteris and Dicksonia.

BREAKING HORSES FOR THE MARKET.

The New York Farmers' Club has continued to listen to the addresses on the horse question delivered by gentlemen who were invited to the task by the club. We propose to take a few paragraphs from the address of H. G. Crickmore, of the New York World. He said: "Breeding for profit," is a subject to which I think every farmer in the United States should give most careful and thoughtful attention, more especially that class owning or working a farm for which is required the labor of four, six or eight horses, half of which should be mares.

In the little travel I have had during the last few years, I have often noticed that very many farmers possess fine-looking, big-bodied mares, but many perhaps a trifle coarse to critical eyes, but not one of which could not, with a little care and some judgment, be made to produce a good percentage on the capital invested in her without any great loss of time as far as usefulness is concerned.

The natural tendency of the wealthy classes of our large cities since the war has been for show and display in horses and equipages. The light skeleton wagon is rapidly giving way to the heavy phaetons and dog-carts for gentlemen and to stylish carriages and coupes for ladies. Already we have a four-in-hand club, one member of which followed the English style of driving a public route, nearly the whole summer season, with a fair promise that he will do the same this summer, with more or less opposition from others anxious to shine in the same sphere. Now, while these may be luxuries that our fore-fathers would scarcely think con-

continental governments may eventually be compelled to look to us for the same material of war is not unlikely, although, as a whole, they are at the present time better supplied with horses than England, having given due attention to the subject of breeding horses some years ago.

Having thus endeavored to show that there is a market for our horses, the next is to show how the market can be supplied, and in this respect I must crave your attention for a moment and travel directly from the subject matter of this paper. As a turf reporter it has long seemed to me that nearly all the State and county agricultural societies have been somewhat neglectful of their true interests, and instead of encouraging the breeding of useful animals in their immediate district by offering encouraging premiums for young stock, brood mares and stallions, they have offered a few cheap medals with little or no attention or accommodation to exhibitors or the exhibited. At the same time they have paid too much attention to the trotting of a lot of worthless gettings, which for any real use were not worth their shoes. Instead of raking so much money on "exhibitions of speed," the societies should buy a half or quarter Hambletonian stallion, or a thoroughbred stallion—the get of Lexington, Australian, or in fact any well-bred stallion—possessing bone and substance, with good trotting action if a trotter—a horse with intelligence that would at once win the eye, and if necessary pass the inspection by a German or Russian government inspector. Any association adopting such a course, with the presumption that the horse would be in the hands of an honest, capable man devoted to his business, would in a few years introduce a new source of

TRANSPARENT GOLD.

In the course of a lecture on gold, delivered before the Franklin Institute, as reported by the Secretary, Mr. A. E. Outerbridge, Jr., of the Assay Department of the Mint in Philadelphia, gave an account of some experiments he had made, with a view of ascertaining how thin a film of gold was necessary to produce a fine gold color.

The plan adopted was as follows: From a sheet of copper rolled down to a thickness of 5-1,000ths of an inch he cut a strip two and one-half by four inches. This strip, containing 20 square inches of surface, after being carefully cleaned and burnished, was weighed on a delicate assay balance. Sufficient gold to produce a fine gold color was then deposited on it by means of the battery; the strip was then dried without rubbing, and re-weighed, and found to have gained 1-10th of a grain, thus showing that one grain of gold can, by this method, be made to cover 200 square inches, as compared to 75 square inches by beating.

By calculation, based on the weight of a cubic inch of pure gold, the thickness of the deposited film was ascertained to be 1,980,400th of an inch, as against 1,367,650th for the beaten film.

An examination under the microscope showed the film to be continuous and not deposited in spots, the whole surface presenting the appearance of pure gold.

Not being satisfied, however, with this proof, and desiring to examine the film by transmitted light, Mr. Outerbridge has since tried several methods for separating the film from the copper, and the following one has proved entirely successful: The gold plating was removed from one side of the copper strip, and by immersing small pieces in weak nitric acid, for several days, the copper was entirely dissolved, leaving the films of gold intact, floating on the surface of the liquid. These were collected on strips of glass, to which they adhered on drying. When viewed with transmitted light with the microscope, it was seen to be of the characteristic bright green color, and very transparent. Viewing it by means of reflected light its true gold color is seen.

Mr. Outerbridge has continued his experiments, and, by the same processes, has succeeded in producing continuous films, which he determined to be only the 12,798,000th of an inch in thickness, or 10,584 times thinner than an ordinary sheet of printing paper, or 60 times less than a single undulation of green light. The weight of gold covering 20 square inches in this case, 25-1,000ths of a grain; one grain being sufficient to cover nearly four square feet of copper.

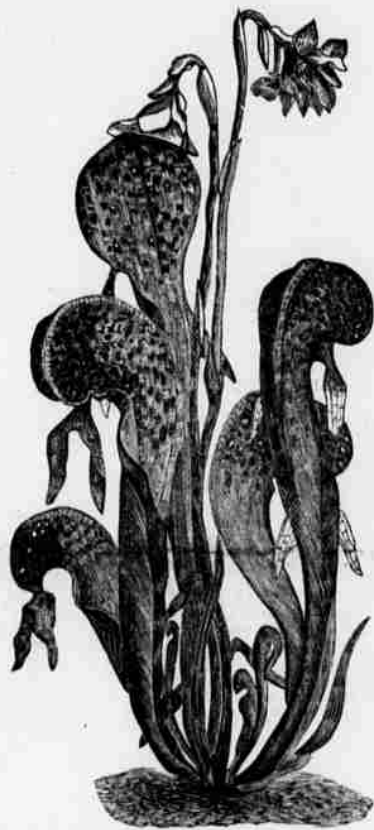
HOW TO PREPARE BOTANICAL SPECIMENS.

The following hints on this subject in the English Mechanic are clear and practical, and on some points the best that we remember to have seen.

Small plants should have the roots; and, if possible, obtain a specimen of each at different seasons—the young plant, in flower, and when the seed or fruit is nearly ripe. Get a square of good thick blotting paper and a couple of large boards and paper on which to mount your specimens. Let the boards be about the same size as the blotting paper. Dampen paper of good quality is the best size for mounting. Arrange your plants between the sheets of blotting paper—some plants require several thicknesses—and see that the leaves, etc., are properly disposed on the paper, as you will not be able to alter them when they are dry. It is a good plan to interpose a few sheets of card-board, as it prevents one plant from spoiling another. When your drying paper is filled, put the whole between your boards and subject to pressure; take them out every 24 hours, and dry the paper, correcting any displacements as you go on; when dry they are ready for mounting. Don't gum or paste them to the paper, but make short slits with a penknife under the stalks about one-eighth of an inch long. Take a piece of paper, as broad as the slit is long, fold the paper, and pass it over the stalk and through the hole at the back, and gum the ends on the back. I have seen every (I think) method of mounting, and this is certainly the neatest and cleanest. After this they must be painted with the following preservative solution: Corrosive sublimate, 20 grains; camphor, 20 grains; rectified spirit of wine, one ounce. This is a deadly poison, and should be handled very cautiously. Each sheet should have a neat label in the corner stating date and place of collection, and name of collector, also general habitat, specific and generic names, with natural order, etc. Without these particulars they will (as a collection) be perfectly valueless.

IN AFRICA.—News, says Nature, has been again received at Munich, after a long time, from the African traveler, Dr. Erwin v. Bary. He had safely returned to Ghat from his journey into the Valley Mihero. He is the first European who has visited the hot springs of Sebarharret and seen the crocodile-pond. Interesting geological and prognostic results, with a collection of many hitherto unknown plants, have been gained from this journey. It was very dangerous, owing to the war of the Aggar with the Hogar of Tuareg, and the traveler was in constant risk of attack. The sheikh of Tuareg, Jehanachen, 102 years old, has lost two sons; so he is not easily propitiated. The murderer of the Dutch traveler, Alexandrine Trine, whose unhappy fate excited European sympathy, goes about freely in Ghat. Dr. v. Bary will endeavor, notwithstanding the danger, to penetrate further into the country of the Tuareg, in order to prosecute his geological and botanical inquiries.

NEW HORSE-SHOE.—Mr. Yates, of Manchester, England, has invented a horse-shoe composed of three thicknesses of cow-hide, compressed into a steel mold and then subjected to a chemical preparation. It lasts longer and weighs only one-fourth as much as the common shoe; it never splits the hoof and has no injurious influence on the foot. It requires no calks; even on asphalt the horse never slips. It is so elastic that the horse's step is lighter and surer. It adheres so closely to the foot that neither dust nor water can penetrate between the shoe and the hoof.



THE PITCHER PLANT.

ducive to a republican form of government, it is a state of affairs that every farmer possessing the means should assist all in his power, for it not only means horseflesh, but it means an increased demand for hay, oats, corn and other products of the earth.

Of course, this is no defense of the system from a political standpoint. All such aristocratic notions mean, of course, a centralization of money, to the advantage of the rich and to the injury of the poor. But that the fact exists there can be no denial, and that it will continue to exist to the end of time is nearly as certain. Consequently, it behooves those in a position to benefit by such ideas to make the most of the fashion by raising horses fit for the work, and he who excels will be the one to make the most money by it.

Another feature of this breeding interest should not be overlooked, and that is the chances this country affords for being the basis of supplies for European governments, to obtain horses both for cavalry and artillery purposes. Horses have recently been shipped from Canada to England for domestic purposes. They found a ready sale, and were much admired; and no longer ago than last autumn that distinguished young statesman and turfite, Lord Rosebery, said in my presence that he thought the domestic horses of the United States were among the best that he had ever seen, and that he thought eventually there would be a great demand for them. This must be taken in connection with the fact that he was one of the original movers for the investigation as to the deterioration of horses in Great Britain, and wrote the report made to the House of Lords on the subject. I know him to be an admirer of the products and industries of the United States, and that the country has in him a friend who will not hesitate a moment to call the government's attention to the markets of the United States, should England ever need horseflesh for her cavalry, artillery or transportation corps. That the

wealth to their members, instead of their mares, as is now often the case, dropping worthless colts and fillies, possessing neither shape nor strength, and often inheriting diseases rendering them at five years old only fit to drag out a miserable existence in a brick yard. Such an association would accomplish at least one object for which it was organized. Not only would the members of the association benefit by the services of their stallions, but new interests would spring up in the vicinity. Every breeder would naturally endeavor to show the best stock, and in course of time "horse fairs" would become one of our most interesting spring and autumn holidays. Bayers would be attracted to the neighborhoods that excelled in any special breeds. Some counties would excel in carriage horses; others in saddle-horses. One would become famous for its chestnuts; another for bays, blacks or grays, as Lincolnshire in England is famous for its roans.

THE PITCHER PLANT.

The engraving on this page is a faithful representation of the Pacific coast representative of one of the most interesting botanical families, and one which has of late years attracted much attention from the foremost scientists of the world, namely, the carnivorous or insect-eating plants. The one in question is the Darlingtonia Californica, or pitcher plant, a native of damp spots along the Sierra and Cascade ranges, some particularly fine specimens coming from Mt. Shasta. It has little beauty to recommend it, but its singular pitcher shaped leaves and the uses to which they are put are a study. They are perfect fly-traps, secreting first a honey which lures the insects, then lined with hairs pointing downwards, which prevent their climbing out, and in the lower portion filled with water which completes their destruction. Whether the plant digests and draws nourishment from them is yet an undecided question.