There are several varieties of steel in the Exhibition. Specimens of wootz or oriental steel, in the form of little conical ingots, are in the Indian collection. They are made from wrought iron fused with twigs of wood and charcoal on a small hearth. There are also specimens of steel called "homogeneous metal," which is very malleable and tough, and contains a low per centage of carbon. It occupies a position between wrought iron and ordinary steel. The barrels of Whitworth's rifles are made of this metal. Very strong tubes for boilers are also made of it. Although recently revived in England, it was invented and patented as claimed by M. Mushet in 1800, and is thus described :—"When iron is presented in fusion to 1-140th or 1-150th part of its weight of charcoal, the resulting product occupies a kind of middle state betwixt malleable iron and steel. It then welds with facility, and may be joined either to iron or steel at a very high welding heat. Thus combined with carbon it is still susceptible of hardening a little, but without any great alteration in the fracture. It possesses an uncommon degree of strength and tenacity, and is capable of an exquisite degree of polish, arising from its complete solidity and the purity of fracture conveyed to it by fusion."

Many samples of steel made by the process of cementations are in the English, French and some other departments of the Exhibition. In England, large quantities of Swedish iron are used in making steel, and different varieties of iron yield different qualities of steel. A knowledge of these differences is generally regarded as a trade secret. The iron for steel is all selected and arranged by experienced persons. They examine its grain, and are very careful in their selections. There were 170 English applicants for space to exhibit steel. Only one-half of this number has been accommodated. The largest Sheffield steel manufacturers have not sent specimens.

In articles of cutlery the English manufacturers believed they were unequaled in their wares, but in the most common articles of pen knives and table cutlery, the French beat them altogether; and with imported English steel, the French makers of surgical instruments have also surpassed the best in Sheffield. Messrs. Naylor & Vickers, of Sheffield, however, display cast-steel railway wheels and steel tires; also cast-steel bells, piston rods and axles, which in their classes are unequaled. Bessemer makes a great display of articles made of his steel, such as rails, tubes, wires and shafts. In the French department, Jackson, Son & Co., exhibit articles of steel made by the Bessemer process, and the Swedes have also sent both iron and steel treated by this system. The German steel is coarse; all the very finest specimens exhibited, excepting the wootz, were made at Sheffield.

TRIAL OF STEAM PLOWS.

An interesting trial with steam plows took place on the 5th of August, at York, England, before the County Agricultural Society. The furrows drawn were 330 yards in length; three steam engines were on the ground, stationed at the end of the field, and ropes and windlasses were employed to drag the plows. About one acre per hour was plowed by two of the plows, and the work was executed in a superior manner to plowing by horses, while the entire cost per acre was about thirty-three per cent less. The weight of the plows ranged from 500 to 700 lbs. in the furrows. One engine used was 8-horse power; it had a single cylinder of 9-inch diameter, and a stroke of 12 inches. It carried steam of 70-lbs. pressure, and the speed was 130 revolutions per minute. The second engine had two cylinders, each of 7-inch diameter, a stroke of 12 inches, steam pressure 70 lbs., speed 130 revolutions per minute, and the power was ten horse. The third engine was of fourteen horse power; it carried 75 lbs. of steam pressure, its two cylinders were 7¾ inches in diameter each, and the stroke 12 inches. Its speed was 180 revolutions per minute, and it plowed 1 acre, 1 rood and 5½ perches per hour, making four furrows, six inches in depth, at once. The smallest engine and plow required six attendants, the next ten-horse power engine, seven, and the largest only three men and two boys. Mr. J. C. Morton, from the Committee of the Yorkshire Agricultural Society, has made a report on the trial, and the following is given by him as the prices of the apparatus employed :—

	£	s.	d.
1. Fowler's 3-furrow plow, 800 yards of rope, 5-tined grubber, and rope porters, two anchors	295	0	0
8-horse power engine	235	0	0
2. Fowler's 14-horse power engine, 4-furrow plow, rope porters, 800 yards of rope, and anchors	875	0	0
7-tined cultivator	70	0	0
3. Howard's double windlass, 1,400 yards of rope and cultivator	220	0	0
3-furrow plow	50	0	0
10-horse power engine	295	0	0

These figures multiplied by 5 give us the prices in dollars.

VALUABLE RECEIPTS.

To Gild Steel.—Make a neutral solution of gold in nitro-muriatic acid (aqua regia) and pour into it a quantity of sulphuric ether; the ether will take up the gold and float upon the denser acid. The article is then to be washed with this auriferous ether (with a hair pencil); the ether flies off and the gold adheres.

To Silver Brass.—Take 1 part chloride of silver (the white precipitate which falls when a solution of common salt is poured into a solution of nitrate of silver or lunar caustic), 3 parts of pearlash, 1 of whiting and 1½ of common salt, or 1 part chloride of silver and 10 parts of cream of tartar, and rub the brass with a moistened piece of cork dipped in the powder.

Piercing a Hole in Glass.—The most simple method of making a hole in glass is, if possible, to pick out a place where there is a bubble in the glass. A very hard steel point is then taken, and worked round in the place, where it generally soon makes a hole down to the bubble, and by a repetition of the process the hole is completed, which is then enlarged at pleasure by a rat-tail file. Care must be taken that the file is smaller than the hole, for if it should stick in the hole the endeavor to disengage it would certainly crack the glass.

To Stain Pine Black.—The pine should be perfectly free from knots (as they will not color), and a strong solution of hot logwood rubbed carefully all over the board and then it is allowed to dry. Another coat may be given, or a number, according to the shade wanted. After the logwood is dried a solution of copperas should be applied in the same way as the logwood.

Poison Balls for Rats and Roaches.—Put a drachm of phosphorus in a bottle along with 2 ounces of water; cork it and plunge it into a vessel of boiling water till the phosphorus is dissolved, then pour it into a mortar along with 3 ounces of lard, and rub it briskly, adding some water, about half a pound of flour and 2 ounces of sugar. The whole is made into a paste and divided into balls about the size of marbles. This is laid down on the floor or shelves for rats, cockroaches or other vermin, who eat and are destroyed. For rats cheese is better than sugar, and tallow better than lard. The cockroaches are fond of anything sweet, hence sugar is a bait for them. Potatoes will answer as well as the flour. These balls should be laid down at night and carefully lifted in the morning, taking care not to let any be touched by a child. They should be locked up through the day.

To Remove Foul Air from Wells.—It is well known that many accidents occur to persons going down into wells to clean them, owing to the noxious gas in such places. To remove the gas before descent is made into any well a quantity of burned but unslacked lime should be thrown down. This, when it comes in contact with whatever water is below, sets free a great amount of heat in the water and lime, which rushes upward, carrying all the deleterious gases with it; after which descent may be made with perfect safety. The lime also absorbs carbonic acid in the well.

Permanent Ink.—Shell-lac, 2 ounces; borax, 1 ounce, distilled or rain water, 18 ounces; boil the whole in a closely covered tin vessel, stirring it occasionally with a glass rod or small stick, until the mixture has become homogeneous; filter, when cold, through a single sheet of blotting paper; mix the filtered solution, which will be about nineteen fluid ounces, with one ounce of mucilage of gum arabic, prepared by dissolving 1 ounce of water, and add pulverized indigo and lampblack, *ad libitum*. Boil the whole again in a covered vessel, and stir the fluid well to effect the complete solution and admixture of the gum arabic; stirring it occasionally while it is cooling, and after it has remained undisturbed for two or three hours that the excess of indigo and lampblack may subside, bottle it for use. The above ink for documentary purposes is invaluable, being, under all ordinary circumstances, indestructible; it is also particularly well adapted for the use of the laboratory. Five drops of kreosote added to a pint of ordinary ink will effectually prevent its becoming moldy.

Honey Comb Pudding.—6 cups of flour; 2 cups of beef suet chopped fine; 2 cups of milk; 2 cups of molasses; 2 cups of raisins; 1 cup of currants; 3 teaspoonfuls of soda and six of cream of tartar, a little salt. Boil three hours. Serve with wine or brandy sauce.

[This receipt was sent to us by one of our female subscribers.

Systematized Cattle Feeding.

The *American Stock Journal* states that there is no established system of cattle feeding in New England, but in Old England there is; and the following table of provender with the cost of fattening one bullock during winter is given by Mr. Blundell, who is an extensive English cattle feeder :—

Debtor.	s.	d.
To 4 lbs. of oilcake meal per day, or 28 lbs. per week at £12 per tun	3	0
To 1 lb. of bean meal per day, at £12 per tun	0	9
To 64 lbs. of mangold per day, or 448 lbs. per week at 10s. per tun	2	0
To 20 lbs. of oat-straw fodder per day, or 140 lbs. per week, at 30s. per tun	1	10
To 20 lbs. of straw litter per day, at 15s. per tun	0	11
To attendance per week	0	6
To interest on capital and gain	3	0
Total	12	0

Creditor.	s.	d.
By increased value of bullock per week	10	8
By value of manure per week	1	4
Total	12	0

The fattening of cattle has been a subject of experiment with Mr. Blundell for many years. The mangold which he feeds is but little known in America as a crop, yet Mr. Blundell states that can raise 30 tuns of mangold where he can raise only 20 tuns of Swedish turnips; and 64 pounds of mangold are equal to 75 pounds of swedes for feed. With respect to hay he says : "As to the 20 pounds of oat straw which he had put down for fodder, he had never yet seen one instance in which a bullock throve on hay. Observation had taught him that hay did not answer; first, because it cloyed the stomach, and next, because the animal did not continue to eat his food so well as when it had straw, and this was especially the case where a large quantity of roots was grown. During the summer months he cut up his clover and fed his beasts under cover, believing it was in that way they would prove most profitable. A ruminating animal required a large amount of straw to distend the stomachand keep up the process of digestion. He thought that the best age to commence fattening was from 18 to 20 months.

Mr. Hedley, in an article in the English *Agricultural Gazette* on the selection of cattle, says : "In my close identification with fat cattle for several years I have always found that the best animals have the most massive heads, the most capacious chests, and the strongest spines." American cattle-feeders have a great advantage over those in England in having such quantities of cheap Indian corn for feed, but this very abundance, we believe, has led them to become careless and unsystematic in feeding. There is nothing lost by adopting a good system, and while the above method of Mr. Blundell cannot be carried out in America as in England, a useful lesson may be derived from his remarks about hay for feed. In the Northern States and Canada hay is the great crop of the farmer for feeding his cattle during winter. According to Mr. Blundell it is very inferior food for cattle. Our farmers should make experiments to settle this question for themselves as it is one of very great importance.

A Praying Machine.—In the Indian department of the great exhibition is a red praying wheel from Thibet. The prayer is written on a piece of paper and fixed to the wheel, which revolves on a spindle held in the hand. The idea of the worshipper is that every time the wheel turns the prayer is made. Frequently the wheel is fitted to be turned by a small stream. In the mountains of Thibet travelers see considerable numbers of these praying machines thus driven by water power.