CENTENNIAL NOTES.

In the English department was exhibited a model of Whitwell's fire brick

HOT BLAST STOVE

for raising the temperature in hot blast furnaces. The usual method of building these stoves has been to construct them of cast iron pipes, which, if the temperature were raised to 1,200° Fah., usually were burned out. In Whitwell's system, the heating surface is constructed entirely of fire brick, which are so laid up that the heated gases are forced through a series of flues, alternately from top to bottom of the stove, until the whole mass of brickwork is raised to a high degree of heat; the stoves will stand a temperature of 2,000° Fah., without damage. Three stoves are used with a furnace, two of which are being heated while the third is having the air forced through it into the furnace. The advantages claimed are that the greatest economy of fuel is secured, nearly the whole heat being utilized, several hundredweights of fuel per tun of iron being saved: that they last a long time with but trifling expense for repairs, and that they are easily cleaned. The estimate of saving in cost of producing iron is 33 per cent.

Among the

ENGLISH CARPETS

we noted several magnificent patterns in Wilton and Axminster. The difference between these very costly kinds of floor covering is not generally understood. Wiltons are Brussels carpets with the loops cut before the wire is drawn out; they are generally closer woven, so the pile, or cut ends, may be packed closer together. The colors of these carpets go clear through to the back, but are only seen there in straight lines. The Axminster carpets, on the contrary, show not only the colors but the pattern on the back, though the pile is only on the right side. Nor is there any limit to the number of colors which may be used. They do not necessarily repeat themselves in any regular order, nor are the patterns repeated, either in regular order or at all, except at the will of the manufacturer. Each carpet has an individuality; but to accomplish these results there is less of machine work and more head and hand labor required. The process is a slow one, but the result may be seen in carpets with a pile of five eighths of an inch high, and so close that it cannot be separated to show the warp. Such carpets endure a great deal of hard service, and when the pile has grown uneven it can be brightened up four or five times by shaving it with a machine made for that purpose.

What is called "patent" Axminster is woven in the loom, and the color does not appear on the back at all. On the surface it would be difficult to tell in what the difference consists. It can be made for a much less cost than the real Axminster, which requires each thread and color to be tied separately by hand to the warp. This is so great a labor that fully three months are required to make a carpet twenty feet square. So great is the difference that the best patent Axminsters can be furnished for much less than half the cheapest real Axminster; yet there seems to be no reason why the patent carpets should not wear as long as the real.

A new method of

ARTISTIC POTTERY WORK

is called the *pâte sur pâte*, or paste upon paste process. The design is raised in white china clay upon a dark ground, the result being a most perfect imitation of a cameo in onyx or agate. White china clay is reduced to a liquid state; and with it this condition, the artist, with a thin brush, paints the design upon the plate, vase, or other object, putting on coat after coat of the liquid china until the desired thickness is obtained in each of the parts. Before burning, the china is opaque, but becomes translucent after burning. The artist, therefore, to properly distribute the light and shade, must put on the material thin or thick, and do this, too, without being able to judge of the effect by the eye; nor can any error of judgment be corrected by subsequent retouchings, as nothing can be done after the piece has been burned.

A model was exhibited by the Erie Railway Company of the famous

WOODEN BRIDGE

that carried that line over the Genesee river at Portage: a structure so arranged that each piece of timber could be separately removed and replaced by a fresh piece without disturbing the strength of the work as a whole. The bridge was further distinguished by the fact that it was the highest wooden bridge in the world, the rails being 235 feet above the level of the water. It was opened to travel August 2, 1852, and was destroyed by fire on May 6, 1875. Hanging beside the model is a photograph of the iron bridge that has taken its place, an airy structure looking like a spider's web outlined against the sky. Not the least wonderful fact in connection with the new bridge was the rapidity with which it was erected, the line being reopened for travel on the 31st of the following July. But this was slow in comparison with what was accomplished (almost simultaneously) by the same company in rebuilding the bridge carrying their metals across the Delaware, three miles above Port Jervis. The bridge comprehended one deck span of 160 feet, three deck spans of 150 feet each, and a span over the Delaware and Hudson canal. The four deck spans were swept away by the ice on the night of March 17, 1875. On the 26th of the following April the new bridge, of iron, double track, was complete and put into service, having been built in just forty days. Another instance of quick work was in the case of the trestle of 780 feet long and 90 feet high, thrown across the Chattahoochie in four and a half days, in August, 1864, by the Construction Corps of the U. S. Military R. R., under the direction of Engineer W. W. Wright. But in this case the piers were standing—the bridge had been burned by the rebels—and the structure was of a temporary character.

In the Tasmanian section a stuffed skin of that wonderful and incomprehensible creature known as the

PLATYPUS OR ORNITHORHYNCHUS,

was displayed. The platypus is a fur-bearing animal, shaped much like a large duck; it has a duck bill and webbed feet, the web extending over the toes. The male has a spur like a rooster on his hind feet; back of the spur is a gland filled with poisonous matter, but the poison is not necessarily fatal. It has the fur and tail of a beaver; small black eyes like a mole; a pouch for carrying the young, like a kangaroo; its tongue is split and forked like a snake's. It lives on vegetable matter, and is amphibious, living, like the beaver, in or out of the water. In its anatomy, it has a wishbone, like a chicken, and in swimming the motions are the same as those of a bird in flying. Naturalists have been inclined to call it a bird, or at least oviparous, producing its young by eggs, but, unfortunately, the accounts of finding the eggs are too conflicting. Some men say they have seen the eggs, one man strengthening his assertion by saying he had eaten them for his breakfast. The young have been seen, evidently when but a few hours old; but no eggs have been found in the runs or holes near the water, which the platypus lives in, like a musk rat. Further than this, the natives say that this platypus does not lay eggs, and their habits of observation ought to make them good authorities on this point. A naturalist, who had dissected one of these animals, claims to have found mammary glands, which would strengthen the belief that the platypus is a beast, but sufficient evidence on this point has not yet been obtained.

In the French milling exhibits was a

BURR STONE MILL

for bolting the flour as it is ground. This consists of a number of fine wire sieves, arranged like rays on the surface of the millstone, through which the flour falls as it is ground, its passage being facilitated by means of a revolving hammer, which jars each sieve. Some of this flour is very fine, but a large portion of it must be reground. What is called high grinding is adopted with this style of stone: that is, the millstones are more widely separated, the husks and fine flour are removed in the usual way, and a rather coarse middlings is left, which, while possessing the most nutritious qualities of the wheat, is too dark and coarse. This is afterwards run through another pair of stones, which grind it into fine flour.

THE SALE OF THE BUILDINGS.

Twenty-four buildings belonging to the Centennial Board of Finance, besides a dozen structures of varying dimensions, the property of individuals, were sold at public auction on November 30. The Main Building, which cost about $1,600,000, was sold to the Permanent Exhibition Company for $250,000. The other structures brought even a less percentage of their original cost. The principal sums realized were as follows: Two Mineral Annexes, cost $19,000, sold for $1,000; Carriage Building, cost $55,000, selling price $4,100; Art Annexe, cost $110,000, selling price $3,500; Photographic Hall, cost $23,000, selling price $1,000; Judges' Hall, cost $30,000, selling price $1,500; Shoe and Leather Building, cost $30,750, selling price $3,000; Agricultural Hall, cost $275,000, selling price $13,100. The remainder of the buildings sold at about similar rates, and the work of removing them will at once begin. The structures left are the Main Building, Machinery and Memorial Halls, German Pavilion, English dwellings, and Horticultural Hall. The Woman's Pavilion, which it was at first proposed to sell, is now to be reserved as a memorial. The Japanese Building will be sold, and the future disposition of the United States Building is not yet announced.

THE OCCUPATIONS AND HEALTH OF THE MERCANTILE CLASSES.

Out of every thousand men engaged in mercantile employments, examined by the enrolment surgeons during the late war between the States, five hundred and twenty were fit for military service: forty more than were furnished per thousand of professional men, and forty-four less than were got from the same number of skilled mechanics. Rated according to the military capacity of their members, the different mercantile occupations stand in the following order: Tobacconists, furnishing 623 per thousand; clerks, 585; peddlers, 580; bar keepers, 500; liquor dealers, 471; grocers, 451; innkeepers, 420; agents, 416; merchants, 392; brokers, 329.

Bar keepers we have transferred from the list of unskilled workmen for comparison with liquor dealers and tobacconists. It is one of the most surprising results of this examination to find those engaged in handling tobacco and spirituous liquors so exceptionally healthy. They not only stand especially well among the mercantile classes, but much better than the members of the higher professions. And curiously, they would seem to be specially free from the disorders of the digestive system and the nervous system which certain popular theories would make inseparable from their employment.

The general health of tobacconists was even better than the foregoing figures would indicate, since 86 per thousand were rejected for conditions not necessarily connected with disease, chiefly for deficiencies in age and size, and 26 for local injuries and deformities, in which the selective action of a light occupation is apparent. In syphilis their record is bad: 16 per thousand, or twice as many as among the clergy, but only half as many as among bar keepers. Their chief diseases are of the digestive system, causing the rejection of 65 per thousand (almost wholly from loss of teeth and hernia); diseases of the circulatory system 43 (mainly heart disease); lung diseases 34; diseases of eye and ear 30, and of organs of locomotion 41. For diseases of the nervous system, they stand about with regular merchants and clerks. They are comparatively free from obesity, and but little troubled with chronic rheumatism.

Clerks were disabled chiefly by conditions not necessarily connected with disease, 76; local injuries 33; diseases of the digestive system (mainly hernia and loss of teeth) 106; diseases of the organs of locomotion 30; of the eye and ear 32; of the circulatory system 44; of the lungs 33. Peddlers rank next to clerks, and show for the most part disabilities not directly attributable to their work; for example, 50 per thousand rejected for conditions not necessarily associated with disease; 40 for loss of teeth; 51 for wounds, fractures, etc.; and 33 for diseases of eye and ear. For inguinal hernia, attributable in many instances no doubt to lifting heavy packs, 39 in the thousand were rejected; 17 for diseases of the joints, and 7 for spinal curvature, largely due, possibly, to the just mentioned cause. Consumption disabled 42 per thousand, and diseases of the circulatory system 48.

Bar keepers and liquor dealers stand near together in military efficiency, high compared with the professional classes, but low as compared with mechanics and laborers. Bar keepers suffer more than liquor dealers from diseases of the digestive system (133 to 40), but less from disorders of the circulatory system (52 to 129); in consumption and disorders of the nervous system their record is good, 21 to the thousand. Liquor dealers suffer more than any other mercantile class from chronic rheumatism, and from diseases of the eye and of the organs of locomotion. Grocers fall below the mean of the mercantile classes. Loss of teeth caused the rejection of 86 per thousand, and hernia, 69. For all disorders of the digestive system, the rejections were 190 per thousand. Disorders of the circulatory system come next, 67 per thousand. For disorders of the nervous system they stand among the worst, 21 per thousand being rejected for this reason; for consumption 35; diseases of the eye and ear 38; of the organs of locomotion 52; for conditions not necessarily associated with disease 27; for injuries, etc., 55.

Innkeepers are a grade lower than grocers in general health, and lead the van in obesity, for which ten per thousand were rejected: the same fault causing the rejection of five grocers and seven agents per thousand, all others of the mercantile class being nearly if not quite free from it. Innkeepers stand universally high also for loss of teeth, 93, and for hernia 48. For all diseases of the digestive system, 223 per thousand were rejected. For diseases of the nervous system, they stand higher than lawyers, and are exceeded only by agents, watchmen, ostlers, and unclassified "other occupations." For diseases of the eye and ear they stand third (44 per thousand), the ratio for brokers being 50, and for liquor dealers 57. They also stand next to brokers and above all others for disabilities arising from wounds, fractures, and malformations.

Agents suffer more than any other mercantile men from lung diseases, 53 per thousand, from diseases of the nervous system 29, and insanity 9; they are exceeded only by merchants in diseases of the digestive system, 189; and are afflicted more than the average by diseases of the circulatory system, 51. As regards syphilis they rank with clergymen, doctors, and public officers. For diseases of the eye and ear, 39 in the thousand were rejected; for diseases of the organs of locomotion 51; for conditions not necessarily associated with disease 49, and for local injuries and malformations 69.

Lowest in military capacity among mercantile men are merchants and brokers. Their disqualifying disabilities present some curious contrasts. For instance, more than twice as many brokers as merchants were rejected for wounds, fractures, malformations, and the like (120 to 56); and nearly fifty per cent more for conditions not necessarily associated with disease (76 to 56). On the other hand nearly three times as many merchants as brokers were rejected for diseases of the organs of locomotion (55 to 19). Evidently a larger proportion of men, unfit for severe labor because of injuries, malformations of hands and feet, and deficiencies in size and strength, adopt the broker's calling. More merchants are disqualified because of hernia and loss of teeth, fewer for disorders of the circulatory system (60 to 82); more for insanity and nervous derangement (13 to 9); and more for consumption (48 to 19). In general health and physical capacity, merchants and brokers rank with physicians, clergymen, and public officers, and were capable of furnishing for the army only about half as many men per thousand as the mass of unskilled laborers. In disorders of the digestive system, they exceeded all except innkeepers (brokers 177, merchants 218). In diseases of the circulatory system, the brokers came next to the liquor dealers (82), the merchants next to grocers (60). The brokers stood lowest in consumption, the merchants next the highest. In chronic rheumatism, the brokers stood second to liquor dealers, and the merchants come next, on a level with agents.

Wanted, A Tiger Exterminator.

During the year 1872 a census was taken in India of the persons who had been killed by wild animals during the years 1868, 1869, and 1870. The total reached 38,218, of which it was found that 25,664 had died through the bites of venomous serpents, while the remaining 12,554 had nearly all been devoured by tigers. So that, for the years mentioned, Her Majesty's dusky subjects were eaten at the rate of about one every two hours. Plenty of such suggestive statistics are at hand. Official reports from Lower Bengal state that 13,400 persons in that section of the country were devoured in six years, and the destruction over the entire