to the pump and "snaked" into the box so as to come out without kinks, half-inch and three-eighths-inch nozzles, an ax, saw, several canvas buckets which fold up so as to be compactly stowed, a canvas cistern, and a small syringe-like hand pump with small hose attached. On the outside are a couple of small ladders, and the pumps and brakes. In using these the three-eighths-inch nozzles are generally employed, since when it is possible to get near the fire, the smaller the jet the better, as less damage is done by water. The use of these little engines very frequently nips in the bud what must otherwise become a serious conflagration; and I think that as in New York we have gone to the extreme of adopting steam engines exclusively, it would be well worth the while of our Commissioners to turn their attention to the advantages of these curricles. The hand engines would appear to the members of our old volunteer department as very ungainly affairs. They consist of a large box containing the pumps and all the necessary hose and equipment, much the same as the curricles, but on a larger scale. They are painted red, with little if any attempt at ornament, and are drawn by horses or by hand, according to the size. The larger ones weigh 2½ tuns in working trim, and require a complement of 40 men to work them.

THE LONDON "STEAMERS."

The steam engines are mostly built by Messrs. Shand & Mason and Merryweather & Co. The engines by the former firm are preferred on many accounts, and range in weight from 26 to 52 cwt. Messrs. Merryweather's engines have the working parts placed under the horizontal body, and are exposed to all the flying mud from the wheels when running to the fire, so that it is necessary to give them a bucket of water before getting to work: they work at a disadvantage on this account. Their weight varies from 30 to 60 cwt. The suction pipe of Messrs. Shand & Mason's engines is kept coupled on while in the station, so that the time of performing this operation is saved, besides insuring that the joint shall be tight. The water is kept always at about 212° by a gas jet which is placed in the firebox, so that but little time is required for raising steam. It takes fourteen minutes to get up steam from cold water. The hose is in forty-feet lengths, two and a half inches in diameter, made of leather, only the best portion of the skin being used, and the rivets are placed half an inch apart. The cross joints are cut at an angle, so as to fold more readily. The hose is all tested to 100 lbs. pressure. The water pressure is from 100 to 150 lbs. The nozzles used range from one and a half inches to three eighths of an inch, increasing by sixteenths from the one and a quarter inch size.

DEFICIENCY OF WATER—PRIMITIVE HYDRANTS.

The great difficulty against which the brigade have to contend is the miserable water supply. As a rule, the water is neither at constant service or high pressure. The fire plugs are surprisingly rude, consisting mainly of a rough cast branch in the water pipe, pointing upwards in a hole in the pavement, and *closed with a wooden plug* which has to be knocked and pryed out. The water then fills the hole and flows up into a canvas cistern about four feet long by two feet wide and two feet deep, having a hole in its bottom to admit the water, the pressure of which, when in, keeps it tight against the pavement. The suction pipes are dropped into this cistern. In some cases a stand pipe having a taper end is driven into the cast-iron nozzle, and is furnished with the necessary couplings at the top. It is unnecessary to say that the leakage with such an arrangement is considerable

LOW AVERAGE OF FIRES.

The daily average number of fires is five; some few days having been entirely exempt, and some having had as many as twelve: but the average is pretty uniform, and I think very small for such a large city. The uniform of the men is plain and suitable. Each man is provided with a hatchet which he carries in his belt, and wears a brass helmet.

Captain Shaw is a gentleman of great experience and ability, and is laboring as rapidly as allowed by the Board of Works to bring the brigade to the highest degree of perfection in efficiency, force and distribution. SLADE.

ICE BOATING.—This unequaled sport is fast becoming an institution on the Hudson River. The Ice Boat Association of Poughkeepsie, where the interest centers, contains ten handsome boats, and as many well-to-do and spirited proprietors; and there are eight or ten boats more on the river. A grand prize regatta has been resolved on for this season; the winner pledged to run twice afterward for the retention of the prize. Three of the vessels of the association made an exploring trip a few days since: the best time made was a run of two miles in one and a half minutes—only 80 miles per hour. Last winter a run of nine miles was made in eight minutes, or 67½ miles per hour. Of course clothing like that of arctic explorers is needed on an open deck rushing through a winter atmosphere at such breathless speed as this. The construction of the ice boat is peculiar but simple. It is V shaped, the point astern and resting on a single pivoted runner by which the craft is steered. The broad front rests on a pair of runners. The deck is but a few inches from the ice: mast, rigging and sails are similar to those of water boats. Steam has not yet been regularly employed, but is cetain to be before long, we judge. These yachts can sail two points nearer to the wind than water craft. Sport in this case will prove the pioneer of business. Practical attempts have been made on the Hudson already, in years past; and the art which is advancing so bravely will doubtless soon be applied to business purposes, as it has begun to be on the upper Mississippi, and will become at its maturity no contemptible competitor with the railroads for winter freight and passengers.

Editorial Summary.

NATIONAL GEOGRAPHICAL PARK.—We have received a circular suggesting inquiry by Congress into the practicability of establishing at Washington a Geographical Park, in which the relative positions and proportions of the several states and territories, with the topography and main features of the continent, shall be represented in miniature. On the representative territory of each state, etc., it is proposed to establish a museum of its productions and history. This is a very pretty plan. In a square mile of ground, the continent might be laid out on a scale of something like one foot to the mile; and such features as the Mississippi River, the great lakes, Niagara Falls, or the Rocky Mountains, might be represented with their outlines clearly visible to the naked eye, though by no means safe from the incautious foot. Gulliver among the Liliputians was nothing, to the American public stumbling or dragging their hoop-skirts over "the great national features of our country" in the Geographical Park. As a facility for the study of geography, we could wish that just such a park were within easy walk of every school house. But we doubt whether its proposed proximity to the halls of Congress and the Executive departments, would enlighten and expand the patriotism of our rulers to the extent anticipated in the circular. Perhaps we have not looked deeply enough into all the bearings of the scheme; but we apprehend that the many millions required to construct and preserve this stupendous toy will not be forthcoming until after the national debt is paid.

THE TAXES.—We are somewhat surprised that Mr. Wells, among his forcible recommendations for the reduction and less oppressive distribution of our taxes (quoted on page 34 of this paper), has made no reference to the burdensome income tax. Perhaps he considered justly that the direct taxes on industry and its products—which are indirect additions to the income tax, compared with which the income tax itself is not worth mentioning; and not only that, but are also levied mercilessly on the poor man's necessaries of life—ought to be the first objects of retrenchment on the list, to which the practical consideration of other reductions might well be postponed. If any thing was ever demonstrated, the American people, who were supposed by European statesmen to be capable of any anomaly in the universe rather than submission to taxation, have demonstrated that they can tax themselves beyond the endurance of any other people—when they have debts to pay. We think it unquestionable that a revision of our tariff and taxes is within the present resources of fiscal science, such as would equalize and diminish all our principal burdens, and at the same time yield unabated revenue, and encourage instead of depressing industry. The income tax cuts deep when it takes five and ten per cent from large incomes: it cuts to the bone when it cuts through to the last $600 per annum.

NEW YORK POST-OFFICE.—The prospect brightens for a post-office worthy of this city and the Union, in place of the old meeting-house and circumambient horse sheds now used for the purpose in Nassau street. The Secretary of the Interior and acting Postmaster-General have united in a strong recommendation to Congress of prompt action in accordance with the report of the Commissioners who investigated the subject during the recess. The House Post-office Committee have agreed to report the bill, and there should be every reason to hope that the necessary appropriation will now be made. The site proposed is the triangular southern end of the City Hall Park, opposite the front or Park Row corner of the SCIENTIFIC AMERICAN office. Its area is 65,259 square feet—equal to about 25 city lots. The ground will cost $500,000, and a building is proposed at a cost of $1,000,000, for the accommodation of the post-office and United States courts. The average of outgoing and incoming mails at this office has increased in the last ten years from 10 tons to 90 or 100 tons per day. Fronting all sides on broad streets, the proposed new post-office will have every facility of access and departure for this heavy business.

TERRA ALBA.—The extent to which this fine white earth is employed in adulterating pulverized sugar, confectionary, flour, prepared cocoa, spices, milk, etc., is incalculable. Dishonesty gives the law to many a traffic and manufacture in these days, and compels those who would rather be honest (so they imagine) to "do as others do." A chalky taste in the delicate white cracker, a tastelessness in bread, a whity scum in the tea cup from a spoonful of snowy sugar, with many another uncomprehended indication, betray the presence of the ever-present adulterator. Two thirds their weight of terra alba has been obtained from lozenges. This comparatively new ingredient is imported from Ireland, and that largely, costing only about one dollar and a quarter per cwt.

RAZING GRINDSTONES.—A subscriber suggests that a simple machine might be made to "raze" grindstones when first hung or out of truth, without the care and labor now employed in that disagreable job. He says a cylinder armed with proper teeth could be attached to the grindstone frame and be driven in a direction contrary to that of the stone's revolution. We see no reason why a simple device of this character could not be contrived, and made so as to feed up automatically as the work proceeds. This is a hint for our inventors.

AT a recent meeting of the Polytechnic Society, Dr. Rowell stated that a cubic mile of water, at a temperature of 40° Fahrenheit, was 900,000 tuns heavier than the same amount at 50° Fahrenheit, and weighed 3,000,000 tuns more than a cubic mile at 60° Fahrenheit.

COST OF MINING.—The Spanish proverb says: "It takes a mine to work a mine." This is emphatically true in our wild territories remote from markets and manufactures, whither almost every article of subsistence, machinery and implements, must be transported hundreds or thousands of miles on rude wagon roads. A comparison of the bullion produced from the most successful mines in Nevada, with the profits that reach the owners, forcibly illustrates the rude conditions under which mining is now carried on. The proprietors of the famous Gould and Curry mines divided last year a quarter of a million net ($252,000), out of a gross product of a million and a half ($1,600,000.) Thus only about 16 per cent of the bullion marketed went to the supposed owners. Other mines have done better, and some have done worse. The Savage mine yielded $1,100,000 in the last six months; net profit $360,000, or 32½ per cent. The Hall and Norcross and Yellow Jacket mines made each very nearly the same operation in twelve months. The Ophir mine yielded $450,000, and no dividend at all. On the other hand, the Eureka of Grass Valley produced $600,000, of which $420,000, just 70 per cent, was profit; and the Eureka of Amador County produced $485,000, of which $310,000, or 64 per cent, was profit. When they get the Pacific Railroad, agriculture and manufactures among themselves, and matured processes of extracting the metal from the ore, our miners may all be able to cry "Eureka."

POPULATION OF THE METROPOLIS.—The census returns for the metropolis proper, so far as it lies within the State of New York—*i. e.*, the "Metropolitan District," or city of New York and its suburban dependencies—have just been published. The population does not appear to be as large as commonly estimated, this city showing but 726,386, Brooklyn, 296,378, and the whole district, 1,224,879. Either these figures are below the truth, or former censuses have been exaggerations. The latter supposition is unlikely; for probably hundreds of families can testify to having received no call from the census taker where one has experienced that attention twice over. There are many temptations to avoid the census taker, and none to seek him out: likewise many temptations to that official to under-do rather than over-do the duty for which he is employed. Certainly, New York and Brooklyn were never so crowded before, notwithstanding the constant increase in the number of dwellings. Landlords can not have it all their own way, as they do here, by proving with figures that houses must be scarce: the fact that houses *are* scarce is what does the business for the unfortunate tenant. As in many large centers of business and employment, the female population are a majority—in New York, of 28,024, and in Brooklyn, of 13,357. Out of these cities, in the suburbs, curiously enough, the males preponderate by 14,464.

BRITISH EXPERIENCE OF STEAM ON CANALS.—Steam tugs are employed on the Gloucester and Berkeley Canal, at an expense only one fourth that of horse power, which costs one farthing per ton per mile against one sixteenth of a penny for steam. The speed has been increased at the same time from one, two and three miles per hour, to three and four miles per hour. The wear of the banks by the "run" of the water has been completely remedied by a band of weather-stone pitching, two feet wide. On the Ashby-de-la-Zouch canal, experiments indicate that no injury is done to the banks, with a speed limited to 3½ miles per hour. In other respects, as the wear of the sides by the boats, and the accumulation of deposits, the canals prove much the better for the employment of steam. On the Grand Canal, Ireland, a system of navigation 160 miles long, screw steamers are successfully employed on a long level of 25½ miles, with a depth of only five feet two inches. On the Forth and Clyde navigation seventy steamers are now employed for carrying cargo, some as large as 120 tons. The tug plan, however, appears to be more generally approved, though on some canals they prefer to use steamers carrying freight and acting as tugs at the same time.

A VERY curious example of photography is seen in the prints of the Exhibition card, prepared by the New Haven Malleable Iron Works, for the French Exposition. The board measuring 6 by 7 feet, contains samples of the various stock articles and tools made by the company, to the number of 746 pieces, none of which are exactly alike. Their arrangement is quite artistic. The photographic copy is only 7 by 9 inches, but the exact form and comparative size of every one of the 746 articles is clearly shown. It would be possible, by means of photography, to present in a few volumes reduced views of the various tools of the world.

THE PRESS.—There are two items of press statistics going the rounds which illustrate our national growth in two striking aspects. The German press of a single State (Pennsylvania) numbers no less than sixty papers, of which seven are dailies, and eleven are religious. The newspapers already flourishing in the Pacific States and Territories number *two hundred and four*. Sixteen of these, however, are outside of the land of Unculpsalm. San Francisco boasts twelve dailies—which is quite up to New York.

UNITED STATES AND CUBA TELEGRAPH.—The conditions under which it is proposed to connect Cuba with Florida, by telegraph, have been approved by the Spanish Government, and the contract has been signed.

COLORADO has apppointed Geo. W. Maynard, an experienced miner and geologist, as Commissioner to the Paris Exposition, and has forwarded a full and rich collection of specimens of her mineral products.