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**THE SCIENTIFIC AMERICAN SUPPLEMENT**

**No. 399,**

**For the Week ending August 25, 1883.**

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## WATER SUPPLY FOR NEW YORK CITY.

A meeting of the New Aqueduct Commission was held in New York, August 8, at which the Commissioner of Public Works presented a report describing three proposed plans for increasing the water supply of the city. The first proposition was the building of a dam and the formation of a reservoir at the lowest available point on the Croton River, and in the Croton Valley. The second proposition was to dam the east branch of the Croton at Brewster's Station.

The third plan was the construction of two aqueducts, one below the present Croton Dam and another above the dam, the object being to add to the present means of delivering the present storage supply and to increase the supply from sources not now utilized. What may be considered a fourth proposition was made by a member of the board who suggested the building of a temporary flume of wood, four feet in cross section, from the present Croton Dam to the city. Estimates regarding this plan are to be made.

But the plan that appeared to find the most favor among the members of the commission, was that of Mr. Isaac Newton, the Chief Engineer of the Croton Water Works, a plan which has been indorsed by seven of the most prominent hydraulic engineers in the country. This is the first proposition, the building of a dam at the lowest point in the Croton Valley at "Quaker Bridge," the reservoir to have an area of 3,635 acres, the water level to be nearly 34 feet above that of the present Croton dam.

The additional watershed thus utilized will be 23 square miles, and the estimated daily increase of water over the present supply will be about 20,000,000 gallons, making a minimum supply for the city of 250,000,000 gallons. The total cost of the dam, land damages, and the new aqueduct, 31·89 miles long, and of circular area of 12 feet diameter, will be as estimated about $14,500,000; but other outside estimates put the cost of this job at $30,000,000, and claim that its construction will be attended with serious dangers; that its success is problematical; that the only sure thing about it is the enormous load of debt which it will entail upon a city now overloaded with indebtedness; and that any one of the other suggested plans would be better, far cheaper, quicker in furnishing the required water supply, and equally effective for permanent use.

## THE CARSON FOOTPRINTS.

Dr. D. W. Harkness read a lengthy paper before the San Francisco Academy of Sciences, on August 6, on the foot marks found in the quarry at Carson, Nevada, some of which resemble those of a biped and have been referred to prehistoric man. To this belief Professor O. C. Marsh expressed a doubt, referring the footprints rather to those of a gigantic sloth, and giving, as one of his reasons for that opinion, the fact that the spread (straddle) of the lines of footsteps was abnormally large for those of man, being eighteen inches, while the length of stride or step is but little over thirty-eight or thirty-nine inches, hardly more than a vigorous stepping six footer of the period would make.

To this principal objection, and other minor ones, Dr. Harkness gives a series of descriptions of the padded surfaces of walkers, from wading birds to springing quadrupeds, and shows that while the bipedal tracks are no less than 400 in number in a series of eight, representing probably so many individuals, they are all similar in character and have no intimation of pad, nail, or talon; but they are crossed and recrossed by well defined tracks of the elk, horse, wild dog or wolf, mammoth, deer, the leaping tiger, the heron or the crane, a web-footed bird, and that of an unidentified quadruped with broad hoofs, sharp pointed at the toes. These all can be classified, but the bipedal tracks in dispute differ from all in showing no natural foot characteristics of structure.

Dr. Harkness' conclusion is that the tracks are those of progenitors of the present human race, and he has given them the title of the "Nevada Man"—*Homo Nevadensis*. The feet that made the impressions were shod with sandals, in one instance of wood and in others of rawhide or other yielding materials. They vary in size from fourteen to twenty inches in length, with an average breadth of about eight inches. Arrangements have been made by the California Academy of Sciences for taking plaster casts of the footprints now exposed, and they are so valuable in palæontological research that the Smithsonian Institution at Washington, the National Museum at Paris, and many other eminent scientific societies have applied for duplicate casts. An area forty-nine feet by eight is to be cast in sections.

## HARD WOOD FLOORING.

The use of beech, birch, and maple has been restricted to a few specific purposes, but the example of the builders of the new Flint Mill at Fall River, in flooring with these woods, will probably be followed by others. The narrow Southern pine planks that have been so long and extensively employed for flooring require to be culled with great care to insure an even floor. They must be straight grained, or they will bend and splay by use, splintering into short slivers dangerous to the feet, and collective of all the fluff and fibrous dirt with which they come in contact. The heart of the pine is especially open to this objection. But a beech or maple floor will wear evenly and smoothly, and has greater endurance for heavy rolling weights than that of the Southern pine. It is more cleanly, and is not so readily inflammable.

The birch when properly seasoned under cover, or kiln dried at a heat not sufficient to vaporize its contained oil, makes a durable and evenly wearing floor. This cheaply estimated wood is really elegant also for furniture purposes. It shows well in cabinet work alternated with maple or apple, and it is fully as valuable for drawers and chests in defending the contents from moths as is the red cedar. The best qualities of birch timber come from the black birch or the yellow birch, the white birch wood being too open or porous for fine finish or durability; and the yellow and black birch grows also to a larger size generally.

The New York *Evening Post* says that the new building of the Pacific Mills at Lawrence, Mass., is to be floored with hard wood, some 300,000 feet to be used, and that other mills throughout Massachusetts, Rhode Island, and Connecticut, have also ordered this hard wood flooring, and it is very evident that Southern pine flooring will find a serious competitor. A good hard pine mill floor board, free of sap and coarse knots, will cost about $28 per thousand feet in large lots, according to the quality, while hard wood flooring will cost from $30 to $32 per thousand feet all dressed and delivered.

## HOW GRANITE COLUMNS ARE POLISHED.

The word "granite" generally conveys the idea of roughness, coarseness, and solidity. The idea of finish, smoothness, and polish does not, in the popular mind, belong to the material. But most kinds of granite are susceptible of a beautiful and almost faultless surface finish. The effect of this finish in contrast with the hammered faced granite, on monuments where a tablet is surface polished, or lines of lettering are in brilliant contrast with the dull gray of the unpolished stone, is very fine, especially so when the shafts of columns are thus finished, the bases being hammered and the capitals carved. As this finish can now be obtained by machinery at a low cost, the possibilities of obdurate granite for ornamental as well as for building purposes have been greatly enlarged.

Granite columns, vases, and similar cylindrical ornaments are polished in a lathe. This differs but little from an ordinary machinist's lathe, except that a continuous bed is not necessary to hold the lathe heads, that the spindle of the foot-stock revolves as well as that of the head stock, and that no tool carriage and appurtenances are required. The head-stock is furnished, like that of the ordinary back-geared lathe, with a back shaft, on which is the driving pulley, or the cone of step pulleys, from which the spindle is driven by means of a gear and pinion, the surface speed of a column under process of grinding and polishing being from 230 to 240 feet per minute, giving to a twelve-inch column about 77 turns per minute, and to a thirty-six inch column about 25 turns per minute.

To center and swing a column in the lathe the stone has a square recess cut each end, into which is fitted a block of cast iron with round hole through its center. The place of this block is found by means of a cross of wood with sliding arms on each of the four limbs of the cross, the arms projecting over the surface of the column longitudinally, and when equidistant from the center denoting the place of the center block, so that the true center of the column or shaft is found, just as it is on an iron shaft, from the circumference. The iron block is secured in place by a running of Babbitt metal, or a similar unshrinking compound, around it. The centers of the lathe spindles fit the holes in the blocks, and when swung in the lathe the column is rotated by means of a lug or dog on the face plate engaging with one seated in the end of the column.

Back of the lathe is a wall of plank against which rest the ends of a number of iron blocks, three or four inches diameter, long enough to project over the column and to have their rear ends resting against the bulkhead or wall. Their under sides are concaved to embrace the column one-fourth of its diameter or less, and as the motion of the column in grinding is reverse to that of the ordinary lathe, the blocks are held against the wall by the rotation of the column. These blocks are arranged closely side by side, and when the column is first worked its irregularities of chiseling and unevenness of contour make these blocks play up and down like the movements of pianoforte keys under the fingers of a performer. But as the grinding progresses this irregular movement becomes a very slight undulation, pleasant to see.

A trough runs under the column its entire length, and from it an attendant shovels beach sand and water on the revolving column, the blocks with their concave faces acting as grinders, just as the hinge clamps of the machinists are used in polishing a turned shaft. And like the clamps, the series of blocks are occasionally pushed along one-half of their width to avoid rings of roughness. This quartz sand is used until all the bruises, "stunts," and chisel marks are taken out, and the surface shows a uniform color. Then the trough is cleaned and emery of the numbers 40 to 60, according to the quality of the stone, is weighed out in the proportion of about half a pound to every superficial foot; thus a column of ten feet in length by three feet diameter—ninety superficial feet—would require from 45 to 50 pounds. This is all weighed out at one time, and is never added to during the entire process. Mixed with water, it is fed to the grinders by the shovelful, over and over, until the grinding is entirely completed. The reason for this is evident from the fact that, in using, the emery becomes ground up and mixed with the *detritus* of the granite and the particles of the iron blocks or grinders, and after a time is a pasty mass losing much of its original sharp grittiness. If,