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Water for Cities.

A plentiful supply of good wholesome water is just as necessary for the health of individuals and families, in city and country, as a bountiful supply of pure air. In many places, however, it becomes an expensive matter to obtain a sufficient quantity of it, but however great the expenses may be, these must and should be incurred. Unlike a certain kind of food which may become scarce, and its place supplied by another kind, no substitute for water can ever be invented or discovered. It forms three-fourths of the weight of our bodies, and the food of our daily meals, and without plenty of it, there can neither be health, cleanliness, nor cheerfulness, in any family or community. In villages where the houses are scattered widely apart, wells in the earth, or cisterns of filtered rain water, are generally found sufficient for the supply of the people; but these become inadequate to fulfill the sanatory conditions of life, when street after street becomes packed with huge buildings, and a dense population; hence some other mode of supply becomes imperative.

At the present moment, various cities and villages in our country seem to be sensibly agitated with regard to procuring supplies of good water. We have now before us a report upon a supply of water for Baltimore, by G. H. Bryson, C. E., and two keen pamphlets, controversial in their character, on providing water for the city of Brooklyn. Beside these, we have lately received letters from various correspondents in relation to supplying certain villages with water.

It is certainly very desirable to know what is the cheapest method of supplying a city with water. Happy, let us say, is that city which can obtain an abundant supply—even although the distance be considerable—by gravitation, for it is indeed an expensive matter to force water from a low to a high level for distribution. Where water is supplied naturally from an elevation, the dams, reservoirs, and conduits are the only great items of expense; to these expenses must be added the engines, and the means of continually working them, when water has to be raised from a low to a high level. But for all these expenses, many cities are thus supplied, both at home and abroad. This is the case with Philadelphia, Pa., Jersey City, N. J., Chicago, Ill., and Cleveland, Ohio, all of which find it for their interests and welfare thus to supply themselves. Steam is the power, used, and Cornish engines are employed in all of these cities, with the exception of Philadelphia, which uses both water power and a Cornish pumping engine—the former being derived from the Schuylkill river, acting upon immense wheels; the latter being the latest introduction, and found, as we are informed, to be the most economical. The city of Glasgow, in Britain, once supplied by water pumped with Cornish engines from a distance of three miles, has found it to be more economical to conduct water by gravitation from a distance of twelve miles. These two facts are worthy of consideration by all cities which are seeking greater supplies of water. The city of Baltimore is fortunate in being able to obtain a large supply of water by gravitation; the city of Brooklyn has not the like sources of supply. The Croton water might be conducted from Manhattan to Long Island by two large pipes, the one to be a safeguard in case of danger in the river, to the other; but such an enterprise, by many, has been looked upon as too hazardous.

It is asserted that plenty of water can easily be collected on Long Island to supply a city with half a million of inhabitants; if this is so, the citizens of Brooklyn should do something more for obtaining that supply than merely making one or two surveys, and expending column after column of ink, year after year, as they have been doing on the subject. The engineering appliances are at hand, ready and able to execute their wishes successfully; it is for them to call them into action.

It is a shame that a city like Brooklyn should have no better means of a general water supply than the public wells.

Free Night Schools.

Free Schools during two hours of five evenings every week are now open in New York and Brooklyn, and will continue for three months. Their object is to afford the means of a better education to young men and women who are engaged at work during the day, and who, from circumstances beyond their control have been compelled to work for a living before they acquired the rudiments of a common education. No young person in this community can plead inability in obtaining a good common education, for the means to obtain such are provided for all. We regret to say, however, that too many young persons, at least those who are, in a measure, their own masters during evening hours, have no honorable ambition to acquire a good and solid education,—hence such noble institutions as Free Schools have less attraction for them than theatres, ball-rooms, and places of amusement. It is also true that those who toil severely all day long, naturally seek for amusement rather than study during spare hours; and this is the case more especially with the most ignorant, the very ones who most require a better education. We therefore hope that all those who employ young persons of a very limited education will use their influence in exhorting them to attend these schools. The teachers of Evening Schools, we hope, will remember that their instructions should be blended with great cheerfulness and kindness, so as to win the attention and affection of their scholars. We hope the master-mechanics will urge upon their apprentices and the young men in their employ the benefits to be obtained from attending these schools. We have known several mechanics who have arisen to distinction for great knowledge, and who had no other means of acquiring an education but by Evening Schools.

New Paper Material.

A correspondent has sent us some samples of a wild plant obtained in Maine, which he considers might be profitably used as a substitute for rags in the manufacture of paper. The samples sent us are very long and strong in the fiber, and resembles flax in appearance. Paper can be made of almost any vegetable substance, but the simple question is one of economy, viz., "of what substance can it be made cheapest?" We have no doubt but beautiful thread and cloth could be made from the material sent us by our correspondent, and it would be well if the ingenuity of our inventors were directed to improvements in processes and machinery for making new fabrics out of new materials, of which, no doubt, many might be profitably cultivated, or gathered wild, in various parts of our country. Cotton, silk, wool, and flax may be said to constitute all the raw materials used in our textile manufactures. In the name of "progressive improvement" let us have a little more variety than the four substances named. Cotton and flax are both vegetable substances, but the fabrics produced from them are entirely different in character. We are confident that a dozen substances—differing as much from one other—might be obtained from sea and land grasses, and the bark of trees, to produce as many different fabrics, all of which would find a sale in the market, owing to the great variety of tastes prevailing.

The Famous George Law Muskets.

We learn from good authority that the Russian Government has purchased the above fire-arms—100,000 old U. S. muskets, we believe—and that the same are now in process of alteration into semi-Minie rifles at Colt's establishment, Hartford, Conn. It is a singular fact that the chief belligerent parties in the present European war have come to the city of Hartford, Conn., to obtain their best arms. Messrs. Robbins & Lawrence are turning out over 1000 rifles per month for the Sharp's Rifle Co., of that place, on an English contract, besides a large quantity of other arms. Extensive additions have been made to their works by the erection of new buildings, and if the war continues, further extensions will be made.

The steamship *Adriatic*, now being built for the Collins line of steamers, will be, when completed, the largest and most magnificent vessel afloat. She will measure five thousand six hundred tuns; her length will be three hundred and forty-five feet on the broad line; depth of hold thirty-three feet; breadth of beam fifty.

Reminiscences of the Paris Industrial Exhibition.

STEAM ENGINES—Many persons suppose that the French people know but little about steam engines, and that their number is very limited in France. This is a mistaken idea, for steam engines of remarkable beauty, and in great numbers, are made and used in that country. While in Paris, those exposed in the grand Exhibition impressed us favorably, both with regard to the simplicity of their character, and the highly cultivated taste displayed in their style of execution. The favorite and most common steam engine used in France is the double horizontal kind, that is, two cylinders yoked at right angles to one shaft. They are mostly low pressure and condensing; the pumps and condenser are placed below, and are worked by eccentrics from the main shaft, and thus they are very compact. The engines of the river boats are of this construction, and a number of these were on exhibition, but not a single large marine one. Some small ones, however, were on exhibition, and one of 30 horse power, as a working model, by Tod & McGreggor, of Glasgow, Scotland, of the steeple class, was well made, but we did not like it; we prefer greater simplicity, such as is now attained in the marine engines built in New York. M. Gache, of Nantes, exhibited a double horizontal river boat engine, and so did M. Creusot, the largest maker of this class of engines in the country. One from Holland, by M. Cail, was justly admired for its workmanship, and gave evidence of the mechanical skill of the genuine Dutch. An engine from Birmingham, England, gained more notice for its elaborate finishing than most of those exhibited, but it did not show such harmony of proportion and skillful arrangement of parts as those made in France. All the large engines for factories in France have double cylinders, and are said to insure perfect steadiness and regularity in working the machinery. Some very large ones of this class were exhibited, but the most unique, for the purpose of insuring a smooth motion, was a small engine having three cylinders with their piston rods so yoked as to overcome all the difficulty of *dead points*. Three cylinder engines are not new, nor are they commendable, as two cylinders can accomplish the same objects with sufficient accuracy, and are certainly much cheaper. We did not attempt to count all the engines exhibited; their number was too imposing for this task.

The French locomotives in contrast with the English ones—and there were quite a number of both—exhibited superiority both in construction and finish. This surprised us not a little, as we did not expect to find such engineering excellence in France, especially when compared with the parent country of the locomotive; but when we remembered that M. Seguin, of the St. Etienne Railway, first greatly increased the heating surface by his tubular locomotive boilers, patented in 1828, and that M. Pelletan early applied the steam jet to increase the draft of the fire, we could not but admit that too little credit has been given to France for what she has done to improve the steam engine. The French locomotives did not appear to be any better than the English ones, but while they exhibited as much power, they displayed a greater artistic finish and beauty of design. Both English and American engineers might learn a lesson from those of France, with respect to combining beauty with usefulness in designing machinery.

France, like all other countries, has her enthusiasts, and perhaps in greater numbers.—We thought so while looking at an engine by M. Paschal, propelled with steam, smoke, and hot air, and which has made nearly as much noise in Paris as the *Ericsson* did in New York. Air is forced in small jets through an annular furnace, surrounded with water on the outside, where the steam is formed, and from which it is taken to mingle with the heated air and products of combustion of the furnace, thence into the cylinder to operate the piston. The working cylinder itself is also heated by a grate, but all the other parts of the engine are the same as those in common use. Its results, so far, have not come up to the anticipations of its admirers and advocates, and never will.—It, however, shows that the French engineers are not of the stand-still order. Without such experiments no improvements could ever be made.

IRON AND STEEL—The display of iron and steel manufactures greatly interested us, more especially the productions of Prussia. As at the World's Fair in London in 1851, so at the Great Exhibition in Paris, 1855, M. Krupp, of Berlin, Prussia, made by far the finest display, surpassing both the French and English steel and iron makers. The Exhibition in London must have done good, for those who witnessed it have confessed that M. Krupp has improved upon his samples of fine steel there exhibited, and it will not be forgotten how these were admired and spoken of. His iron books, with leaves thin as paper were described as the most wonderful achievement in the science of iron making. We must confess that it was impossible to ascertain whether France, Germany, or England occupied the first place for iron products, so far, however, as it relates to commercial utility—cheapness of product—England surpasses all the others, but the products of each—taking a general view of them—were nearly alike, massive and beautiful. There were huge iron rails 60 feet long, and iron girders of equal length. There were iron plates for the new French gun boats, 30 feet long, 6 feet wide, and 4 inches thick, made by M. Cave & Co., and intended to knock down with impunity the granite walls of fort and citadel. There were also displayed sheets of iron 30 feet long, and as many wide, and M. Petin & Co., displayed steel tires for locomotive wheels 15 feet in diameter. The wheel adopted on all the French lines of railroads is composed of a corrugated steel disk bound to a steel tire, and a solid hub pierced for the axle. These are stated to be cheaper and stronger than any other kind—the cheapness having reference to durability. One large wheel 18 feet in diameter, forged wholly of iron—nave, felly, and spokes,—exhibited by a M. Gouin, attracted much attention for its huge proportions, and the massive machinery required to forge it. We were not prepared to see such masses of iron forged into wheels, beams, and plates, but the Titan power of steam is equal to the task. Those on exhibition were worth a voyage across the Atlantic to behold.

Fair of the American Institute.

This exhibition opened on the 4th, at the Crystal Palace, as previously announced, but the articles were so illy arranged, we concluded it best to defer our remarks on the merits or demerits of the products displayed until next week.

There is a good prospect that the Fair this year will be the best the Institute has ever had, but it will be some days before order and system prevails throughout the building. The Exhibition will be kept open during the entire month, and next week we shall devote considerable space to the subject, and continue it from week to week till the Fair closes.

Carpenter's Rotary Pump is advertised in another column. It is a good one. Reader, just refer to the pungent manner in which the advertisers speak of its merits.

An article on the encroachments of the Patent Office by the Secretary of the Interior, prepared for this number, is unavoidably crowded out. It will appear next week.