We have of late years heard much of drought and consequent famine in the Cape de Verd Islands. The soil is of a peculiarly porous nature, and therefore requires a constant supply of moisture as an indispensable condition of fertility. For a long time the climate has been constantly growing less and less humid. The Socorrodos, the largest river in Madeira, formerly had a sufficient depth of water to float timber down to the sea. It is now a mere rivulet, whose waters, except in flood time, are scarcely discoverable as they trickle along its pebbly bed. This diminution of moisture can be traced directly to the destruction of the forests that formerly covered the mountain sides. The Portuguese government were early aware of this, and laws were framed prohibiting the cutting down of trees. But timber was valuable, and the land was wanted for vineyards. Portuguese laws were powerless against the demands of immediate interest. So the trees were cut down, the springs failed, and fountains dried up. Hence came drought, famine, and destitution. Present gain must sometimes be purchased by future loss. 81-4

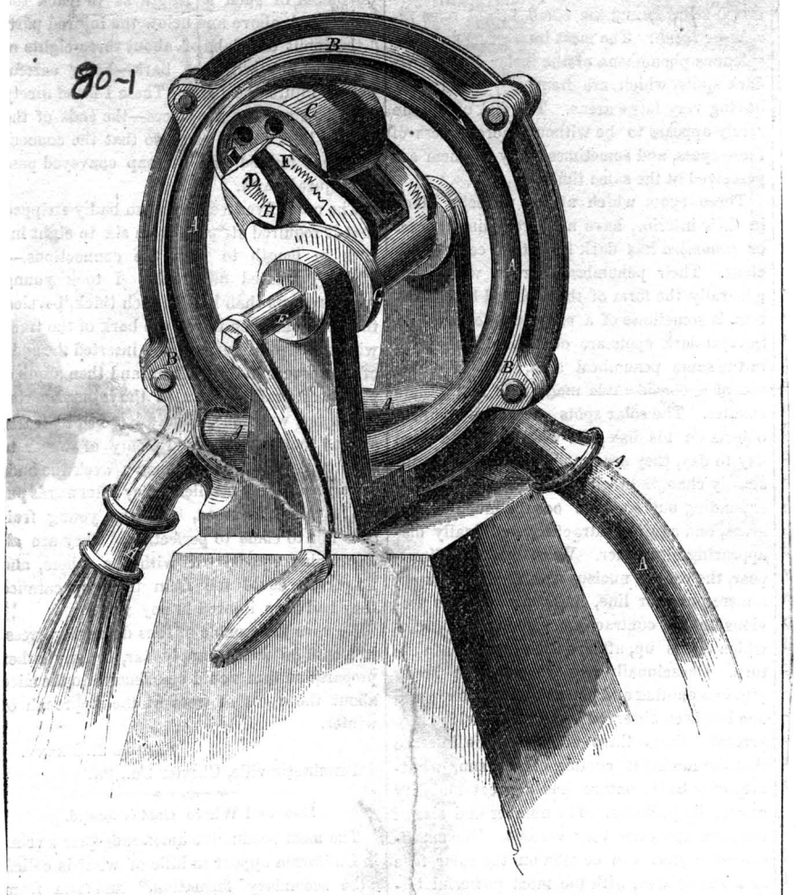
Trees regulate the supply of moisture in many ways, even where we cannot suppose that they affect its absolute amount. The evaporation from their leaves is considerable, and this, diffused through the atmosphere, is wafted over wide tracts of country. They shelter the ground beneath them, and thus prevent the water that falls from being carried off by evaporation, allowing it to penetrate the earth, keeping the springs and fountains in perpetual flow in the driest seasons. Their roots and interlacing fibres penetrate the soil, preventing it from being washed away by sudden showers, and forming a sort of sponge that absorbs the water, and gives it out slowly and uniformly, thus equalizing its flow, preventing droughts on the one hand, and floods on the other. When the forests on hillsides and ravine slopes are cut down, the rain slides off from them as from a roof. A sudden shower swells every rivulet into a torrent. Every tiny brook pours its accumulation at once in the rivers, whose channels are inadequate to carry off the sudden accession, hence disastrous inundations, followed at short intervals by low water. The supply of water that should have been distributed over weeks is exhausted in hours. That which should have bubbled up in springs and flowed through rivulets, making the meadows green, is carried at once through the great rivers to the ocean, to be again taken up by evaporation only to go again through the same round. The volume of the great rivers, the Danubes, the Mississippis, the Niles, the Rhines, and the Euphrates may undergo no change from age to age; for they derive their waters from a wide extent of country, and droughts in one section are balanced by showers in another. But the smaller rivers diminish, the rivulets dry up, and the springs fail, except immediately after rains, when they are greatly swollen. Thus by the operation of one law, the destruction of forests causes the two opposite evils of floods and droughts.

Humboldt called public attention to the probable consequences of the destruction of forests as early as the year 1800. It is a well known fact, that the lakes in the valley of Mexico have greatly contracted since the old Aztec times. The city of Mexico occupies its ancient site, but it is now some distance inshore instead of on an island, as formerly. This is to be ascribed to the felling of the forests that clothed the adjacent hills. The British Association has collected from India a vast amount of information bearing upon the same point. Among the hills of Ceylon, where the forests have been cut down, in order to form coffee plantations, the loss of the springs and fountains has already become an evil of great magnitude.

Our own country is yet too new, and our forests are yet, in spite of woodmen and axes, too numerous for the scarcity of water to have become a serious evil. But like causes produce like effects; and unless we change our procedure, our children will suffer from our wanton carelessness. We have no right for our own temporary advantage to desolate the country. No generation has more than a life-interest in the earth, of which it is but the trustee of posterity. Every man who has revisited his early home in the older States, after an absence of a few years, can not have failed to notice the diminution of the streams and springs. There is probably no water in the brook that turned his water-wheel. The springs in the pasture, which he remembers as ever-flowing, are dry; and if a season of unusual drought happens, the cattle must be driven long distances to water—a necessity which never was known in his early years. More especially will this be the case if a railroad or an iron establishment has occasioned a rapid demand for fuel. The trees have gone, and with them the water; and the meadows and fields are dry and parched. In their haste to be rich, the farmers have killed the goose that laid the golden eggs for them.

NOVEL ROTARY PUMP.

80-1



New Rotary Pump.

Our engraving illustrates an improvement in pumps of a rather novel character. No piston or valves of any kind are employed. The invention consists of a coil of india rubber pipe, A, placed within a metallic ring, B. The suction necessary to raise the water is produced by compressing the rubber by means of roller, C, against the ring, B. The roller is attached to bearings, D, in the arms, F, on shaft, E, rotary motion being given by the crank.

As the roller revolves in the direction of the arrow it presses the rubber tube, forces out the water in front, at A', and thus produces a vacuum behind, which the water fills as fast as the roller advances. Cam G presses the roller, C, up against the rubber tube, B; the set screws, H, serve to adjust the degree of pressure given to roller, C. When the pump is not in use the handle is turned backwards from the direction of the arrow, which at once presents the lower side of the cam to the set screws, H, and thus removes the pressure of roller, C, upon the elastic tube. 80-2

This is both a suction and force pump. It is extremely simple in construction, said to be very durable, and to possess, among others, the following advantages:—

It is not liable to get out of repair, and in case it should, it can be repaired by any one who can use a screw-driver. It has no valves, and can be used in pumping any kind of liquid substance, and can be put up easily without the aid of a plumber; it discharges the water after use, so that it will not freeze in winter; it can be put in the house if the well is out of doors, while the chain pump must be put directly over the well; it is a fire-engine for every house, although only costing about the same as an ordinary suction pump; being rotary, it can be easily driven by power. It is not affected by steam or any kind of acids, and will stand any climate. Messrs. George Denison and D. S Mcnamara are the inventors of the described improvements in this apparatus, for which application has been made for a patent. A part of the invention was patented to Denison & Bradley, April 17th, 1855. Foreign patents are in process of being secured. For further information apply to Asa Farr, Jr, No. 55 Cliff st., New York City.

Extracting Heat Water

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This branch of business is one that commends itself to public attention. 80-3

The Philadelphia Water Works.—We give below the amount of water pumped into the basin at Fairmount, Twenty-fourth Ward, the Schuylkill and Delaware Water Works, for the past seven months ending the 1st of August, and used in the First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth and Tenth Wards. The amount pumped at the Fairmount Works, with nine wheels, was as follows:—

	Total Quantity of Water Pumped.	*Average Quantity Pumped per Day.*
January,	175,849,265	5,672,556
February,	260,365,734	9,298,776
March,	188,362,436	6,398,788
April,	228,300,427	7,610,014
May,	264,909,060	8,548,064
June,	292,962,121	9,765,404
July,	344,425,448	11,110,498
Total,	1,775,255,581	8,486,300

The Schuylkill Steamworks, with four engines, for the use of the Eleventh, Twelfth, Thirteenth, Fourteenth, Fifteenth and Twentieth Wards:

January,	126,202,440	4,071,046
February,	142,768,656	5,099,880
March,	157,723,087	5,087,809
April,	181,892,006	6,063,066
May,	231,264,424	7,460,142
June,	230,500,320	7,683,344
July,	243,614,288	7,858,525
Total,	1,313,965,221	6,181,973

At the Delaware Works, for the Sixteenth, Seventeenth, Eighteenth, Nineteenth and part of the Twenty-third Ward, the amount was as follows:

January,	48,475,925	1,563,739
February,	52,299,724	1,874,990
March,	59,822,406	1,929,755
April,	63,194,637	1,206,288
May,	77,290,940	2,493,253
June,	73,030,102	2,434,336
July,	87,273,365	2,547,495
Total,	461,387,099	2,178,550

At the Twenty-fourth Ward Works, for the supply of the Twenty-fourth Ward, the operation of the two pumps was as follows:

January,	6,525,630	210,504
February,	5,553,670	198,324
March,	7,009,470	226,112
April,	8,918,100	297,270
May,	11,087,820	357,639
June,	12,159,090	405,303
July,	14,383,800	463,961
	59,107,580	308,473

Fires in July.—By the report of the Chief of the Fire Detective Police, it seems that the number of fifty-seven, which