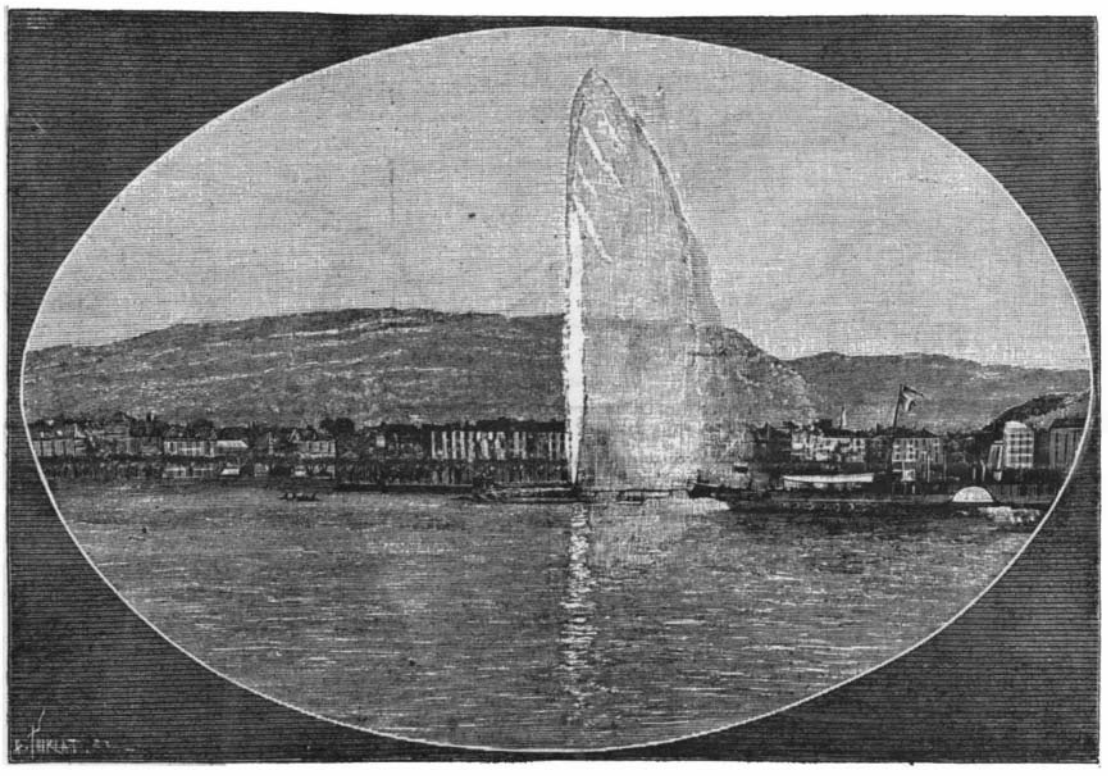
THE FOUNTAIN AT GENEVA.

Our engraving represents the fountain that the municipality of Geneva has recently established at the entrance of the port of that city, at the extremity of the south jetty. This is certainly the largest fountain that exists upon the surface of the globe, since it is no less than three hundred feet in height. It may be seen from a great distance, in clear weather, detaching itself like a great white sail flapping through the effect of the wind.

The city of Geneva possesses a most complete distribution of water under pressure, the motive power for which is obtained from an artificial fall established upon the Rhone at the point of the lake. The water for domestic purposes and for the running of certain motors is raised to a height of 215 feet above the level of the lake. For the distribution of motive force, it is raised to a height of 460 feet. The reservoir is an open air one, and is situated upon the top of Bessinges, at a distance of three miles from the turbine building. A very ingenious regulator, invented by Mr. Turrettini, assures the uniformity of pressure in the piping.

The length of the first pipe line is about 40 miles, and that of the second about 60. It is with this latter that the fountain conduit is connected. The latter is set in play only on Sundays. It is sometimes set in operation also on week days, in the evening. Instead of a single jet of great height, several are then utilized that do not rise so high. Powerful electric light projectors, placed in a structure near by, brightly illuminate them with their rays of varied colors, which transform them into a luminous fountain of the most beautiful aspect.—La Nature.



THE GENEVA FOUNTAIN.

Safer Than Lightning Rods.

Each day adds some new virtues to the long list of those already credited to the pneumatic. The latest of these is that the wheels of a bicycle being encircled by a band of India rubber and dry air—which is a perfect insulator—the rider is completely insulated from the earth, and, consequently, is impervious to the attacks of the electric fluid. Thus, day by day it becomes more and more a fact that life without a pneumatic tire is neither safe nor worth having. Any one who suffers from nervousness during a thunder shower has now only to go into a barn or the cellar and seat himself upon the saddle of a pneumatic-tired bicycle to be perfectly safe from lightning stroke. As the chances of a man on a bicycle being struck by lightning have been carefully calculated to be about one in a billion, the Wheel adds, there will, of course, be some pessimists who will deny that this newly discovered virtue of the pneumatic as a lightning insulator amounts to very much.

Ancient Glass.

The glass blowers of ancient Thebes are known to have been as proficient in that particular art as the most scientific craftsman of the same trade of the present day, after a lapse of forty centuries of so-called "progress." They were well acquainted with the art of staining glass, and are known to have produced that commodity in great profusion and perfection.

Rossellini gives an illustration of a piece of stained glass known to be 4,000 years old, which displayed artistic taste of high order, both in tint and design. In this case the color is struck through the vitrified structure, and he mentions designs struck entirely in pieces from ½ inch to ¾ inch thick, the color being perfectly incorporated with the structure of the piece, and exactly the same on both the obverse and reverse sides.

The priests of Ptah at Memphis were adepts in the glassmaker's art, and not only did they have factories for manufacturing the common crystal variety, but they had learned the vitrifying of the different colors and the imitating of precious stones to perfection. Their imitations of the amethyst and of the various other colored gems were so true to nature that even now, after they have lain in the desert sands from 2,000 to 4,000 years, it takes an expert to distinguish the genuine articles from the spurious. It has been shown that, besides being experts in glass making and glass coloring, they used the diamond in cutting and engraving glass. In the British Museum there is a beautiful piece of stained glass, with an engraved emblazonment of the monarch Thothmes III. who lived 3,400 years ago.

The New European Ship Canals.

The opening of the Corinth Canal in Greece and of the Manchester Canal in England having now been followed by the practical completion of the Baltic and North Sea Canal in Germany, a review of some of the salient features of these important works is opportune. While they possess many points of similarity, they present marked differences in the purposes they are intended to serve.

The Corinth Ship Canal affords a passage from sea to sea and is intended to meet the needs of commerce by shortening a route which is not, however, one of the highest degree of importance. Taking advantage of the fact that the Gulf of Corinth, lying in a general easterly and westerly direction, nearly separates Greece into two parts, this canal pierces the narrow Isthmus of Corinth and thus furnishes a passage from the Gulf of Corinth on the west to the Gulf of Ægina on the east. It thereby shortens the sea route from the western Mediterranean and from the Adriatic to the seaports of Eastern Greece, Turkey, Asia Minor and the Black Sea. The distance saved differs considerably in different cases, depending upon the ports of departure and destination, but is not more than 185 miles in any case. This canal is about 4 miles in length and has a minimum width of 72 feet at the bottom and 77 feet at the surface of the water, the sides rising very abruptly and being faced with masonry to a height of several feet above the water level. The minimum depth is 26 feet. The axis practically follows a straight line which passes through a low country toward either end, but in the middle portion encounters a rocky ridge, necessitating a cut about 260 feet deep in one part. The total quantity of earth and rock removed is estimated at 11,500,000 c. m. Breakwaters and artificial harbor works have been found necessary at both entrances. A high bridge, carrying the Piræus & Peloponnesus Railway, crosses near the western end. The canal is lighted at night by electricity.

The formal opening of the Corinth Canal, which took place in August, 1893, marked the final achievement of a scheme dating back in one form or another to ancient times. The work as completed follows closely, in some parts at least, the line of a similar undertaking on which much labor was expended in the time of Nero. The modern project dates back to 1881. Work began in 1882 and was prosecuted vigorously for some years, but in 1889 ceased for a time owing to lack of funds. The enterprise was afterward taken up by a new company, the Société Hellenique du Canal de Corinthe. Work was resumed in 1890 and carried to a successful conclusion in 1893. The total cost was about $13,000,000. The lease held by the present company is to continue in force for 99 years, at the end of which period the canal is to become the property of the Greek government on the payment of $1,000,000.

Turning now to a much larger and much more costly work, the Manchester Ship Canal, special mention should be made of the fact that the main purpose served by this great artificial waterway is to give deep draught vessels direct access to the important manufacturing city of Manchester. Formerly it was necessary to depend chiefly upon the shipping facilities afforded by Liverpool, and the canal project encountered active opposition from interests identified with this port and from the railroads affected. Authority having been finally granted by Parliament, after a prolonged discussion extending over a period of several years, and a company having been formed, the work of excavation began late in the autumn of 1887 and was pushed forward with energy. Unexpected delays occurred later, owing to financial embarrassment and other causes, but all difficulties were overcome and the enterprise was carried through to completion within the space of six years. It was believed at first that four years would be sufficient and that the cost would not exceed $30,000,000. The actual outlay was about $75,000,000. Although Manchester is 50 miles from the sea, it was not necessary to carry the canal this entire distance, as the tidal estuary of the Mersey furnished an approach for about 15 miles from the sea. Throughout the remaining 35 miles existing water courses were enlarged and utilized wherever practicable, including along one part of the route an old canal of small cross section. As Manchester has an elevation of 60 feet above the sea level, an ascent of this amount was necessary, and was accomplished by a system of locks. The line of the ship canal is crossed by a number of highways and railroads, besides a smaller canal, and numerous engineering problems were encountered. In some cases fixed bridges were required; where these occur they have a minimum height above the canal of 75 feet in the clear. The minimum depth of the canal is not less than 26 feet, and the minimum width at the bottom is 120 feet. The sides are protected by masonry, where this seemed advisable, the aim being to permit a speed of about 6 knots, thus enabling a vessel to pass from the entrance up to Manchester in eight or nine hours. By the use of electric lights the canal is made navigable by night as well as by day. The preliminary opening took place early in December, 1893, and the canal was formally opened for general traffic on January 1, 1894. It may be added that Manchester is the center of a district said to be more thickly populated and to show a greater output of commercial products than any other region of like area in the civilized world. The density of population is 13 times as great as that of Belgium, which is said to have more inhabitants to the square mile than any other country of Europe. The Manchester region contributes two-thirds of the total value of British exports.

The Baltic and North Sea Canal differs from the other two, concerning which some details have just been given, in that it owes its construction primarily to political and strategic considerations rather than to the commercial advantages which will incidentally result from it. Germany has two naval yards of great importance, one at Kiel on the Baltic and the other at Wilhelmshafen on the North Sea, and in order that vessels may be able to pass promptly between them and concentrate in either sea the ship canal has been cut under the auspices of the German government. It extends from Kiel to the River Elbe, entering the latter at a point below which deep water extends to the North Sea. Commercially the canal is important in the saving of time heretofore lost in going around the northern end of Denmark and in making it possible to avoid a stormy and dangerous passage. The distance saved between ports is from 100 to 425 miles, according to their relative position. The canal is practically a sea level one, there being tidal locks at the ends, but none along the course of the waterway. It was necessary to build several bridges over the canal, but they do not interfere with navigation. The fixed bridges, of which there are two, have a height in the clear of 138 feet. The cutting was largely through a low country, following an old canal in part. At the highest point there is a ridge rising 82 feet above the sea. There are several sharp turns, though the general course is a fairly direct one. The canal is 61 miles long. The standard depth is to be 29·5 feet upon final completion in all parts. The width at the bottom is 72 feet. Work on this canal began in 1887. It was then expected that it would be necessary to excavate about 77,000,000 c. m. of material, but this estimate was too small by from 3,000,000 to 5,000,000 c. m. The total cost of the canal amounts to about $40,000,000, of which Prussia pays about one-third, the remaining part being paid by the German Empire.—Iron Age.

TWENTY-FOUR carat gold is all gold; 22 carat gold has 22 parts of gold, 1 of silver and 1 of copper; 18 carat gold has 18 parts of pure gold and 3 parts each of silver and copper in its composition; 12 carat gold is half gold, the remainder being made up of 3½ parts of silver and 8½ parts copper.