

Hong Kong's Plight Illustrates Part That Water Plays in Building a City

WASHINGTON, D. C., July 26.—The plight of Hong Kong, where a drought has made it necessary to import emergency supplies of water by the shipload for a community of more than half a million people, emphasizes the dependence of cities on an abundance of water.

A bulletin from the Washington, D. C., headquarters of the National Geographic society tells of the various sources of water supply to which cities have turned and traces the development of the modern city waterworks.

"So long as men live in villages the problem of a supply of water for drinking and other household purposes usually can be solved easily," says the bulletin. "But when the village grows into a town and the town into a city, the furnishing of an adequate amount of water becomes increasingly difficult. The history of the growth of great cities in all parts of the world has in large part been the history of the reaching out farther and farther for a greater supply of this all-important fluid.

Water Supply Is Age-Old Problem

"It is not a modern problem. Six thousand years ago the cities that grew up in the valleys of the Tigris and Euphrates and the Nile were faced with the same need for a dependable water supply. In fact they grew where they did because water was there easily available. Because they were situated on level valley lands, these earliest cities of which we know could bring in water in canals, and from these the populace dipped it as they needed it.

"Phoenicians were probably the first to construct what may be called waterworks. They sank a series of shafts and connected the bottoms by tunnels, thus leading a stream of water underground from upland sources to their coastal cities. Impervious strata were chosen in which to dig the tunnels, and in this way loss by seepage and evaporation was avoided. Such underground water systems are still made use of in the near east, notably in Persia where all the larger cities obtain their water from such hidden streams.

"The early Greeks borrowed the shaft-tunnel system from Syria, and conducted water to a number of their cities in this way as well as by surface canals.

"Most of these earliest city water systems were for the purpose of furnishing a necessity—the water which was essential for drinking and cooking and cleaning. There were public baths in Greek cities, but apparently it was not until Rome had grown into a great city that a marked concentration of population that the idea came to supply to such a big population center a superabundance of water—not only enough to meet the urgent necessities of the populace, but also a large surplus to increase their comfort and pleasure. Some of the greatest engineering accomplishments of the Romans were in the construction of their aqueducts. The ruins of a number of these great works, stretching across valleys and lowlands near Rome on arches from 50 to 100 or more feet high, are among the most striking remains of the ancient Roman civilization.

Rome Reached Out 60 Miles for Water

"The earliest of the Roman aqueducts had its source of water supply less than seven miles from the city. But as the population grew and more and more water was required, new aqueducts were built extending 11, 29, 40 and even 61 miles into the country. A popular idea that these aqueduct channels were all carried far above ground is incorrect. Long sections of most of the channels were underground, and in some cases high hills were pierced for them by long, deep tunnels.

"Although Rome surpassed all earlier great cities in the abundance of its water supply, it did not go far beyond them in the matter of distribution. For the most part the water for household use was fed to fountains and reservoirs from which it was necessary for the people or their servants to take it in jars. Supplies were also

conducted to important public buildings, to the private homes of a few very wealthy families, and to the public baths.

"The dwellers in the cities of medieval Europe, like those of many cities of the near and far east today, had water supplies far inferior to that of the Romans. Some of the outstanding exceptions were cities established as Roman colonies. In which the Roman-built aqueducts continued to function. The typical medieval city depended on wells, and on cisterns filled by rain-water drained from roofs. The water was often unclean and easily became contaminated. These polluted city water supplies played an important part in the recurrence of the devastating plagues that swept over European cities during the middle ages.

"London began piping water into the city from outside sources as early as 1236, but it was supplied only to fountains and reservoirs. Few connections to individual homes were made before the 18th century, and it was not until well into the 19th century that this ultimate step in city water distribution took water into the dwellings of a large percentage of the city's population. Until cast-iron and wrought-iron pipe could be made cheaply and in great quantities the piping of water into large numbers of individual homes was out of the question. The earliest London water mains were of lead and wood. Most of the present London water supply is taken from the Thames not many miles above the city.

New York Uses Nearly a Billion Gallons a Day

"New York, situated on a relatively small island, had great water difficulty in London in obtaining an adequate water supply. Until 1842 the city depended on local wells and springs. If Manhattan's present supply came from the island's rainfall, a cloud bank more than 25 miles deep would have to discharge its water burden daily. In the forties the Croton aqueduct was constructed bringing what was then an abundant quantity of water from a distance of 25 miles or more north of the city. Since that time the city has found it necessary to reach farther and farther to the north to tap additional sources. Early in the twentieth century a great artificial subterranean river was constructed to flow for nearly 100 miles from the Catskill mountains, under the Hudson river, and beneath the city, finally to bubble up into its network of distributing pipes. New York's combined water supply now constitutes the greatest city water system in the world. It furnishes to the inhabitants of Greater New York an average of nearly 900 million gallons a day.

"Chicago obtains its water supply simply and economically. Tunnels have been extended under the bed of Lake Michigan for only three or four miles from shore, and through these, great streams of lake water are pumped into the city. Similar systems supply Milwaukee, Cleveland and Buffalo. St. Louis and New Orleans get their water supplies from the Mississippi river, and because of the great amounts of mud carried in suspension, must make use of systems of settling tanks and must also treat the water chemically.

"Los Angeles has had to reach out farther for its water than any other American city. It transports the greater part of its supply in a huge conduit for more than 250 miles, much of the distance across deserts. For the additional supply which the city will soon need it plans to reach even farther—300 miles, east to the Colorado river.

"The world's record for distance over which a large volume of water is piped for community use is held in western Australia by the three desert-surrounded, gold-mining towns: Kalbarrie, Cockatrice, and Boulder. Five million gallons of water a day are pumped to these communities through 351 miles of pipe 23 inches in diameter.

"Wells still play their part in furnishing water to large cities; but they are not the crude, shallow pits of the middle ages. In-

stead, they are shafts drilled to a depth of hundreds or perhaps a thousand or more feet and from them, electric pumps lift millions of gallons of pure water daily. El Paso, Texas, a city of more than 117,000 population, and numerous smaller cities of the American west, as well as Memphis, Tennessee, and other cities near the Atlantic seaboard, obtain in this way an abundant water supply.

"Other island cities besides Hong Kong are dependent on local rainfall to furnish their water. St. Thomas, in the Virgin Islands, has constructed a brick-paved watershed near the town to aid in the collection of clean water. A sim-

ilar concrete-covered watershed on the rocky, prominent slope of the Rock of Gibraltar. In Key West rain-water, drained from roofs into cisterns, makes up the main supply. As the city has grown, however, it has been necessary to ship in water by rail in tank cars from the mainland.

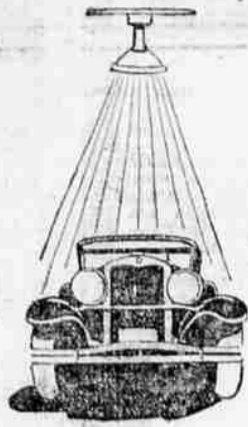
"In a few arid coastal regions, the fresh water that can be collected from all sources is inadequate to meet the needs of the population, and in order to supplement the supply for towns it is necessary to distill sea water. Jidda on the Red Sea is a typical example. In the hot sun, a haked town where drinking water is thus wrung from the sea. The

condensing factory is one of the landmarks of the Jidda harbor.

AVIATORS REGRET LOSS OF HOTEL ON MOUNTAIN

SPRINGFIELD, Mass. (AP)—Destruction of the summit house on Mt. Tom, in the Connecticut valley, caused consternation among those, not because they feared or stopped there but because the sun's rays.

COPENHAGEN (AP)—From dating the Neanderthal man. He Greenland Dr. Phil Poul Norlund said the bones showed this early has brought human bones which man was a giant, had a very low forehead and almost no neck.



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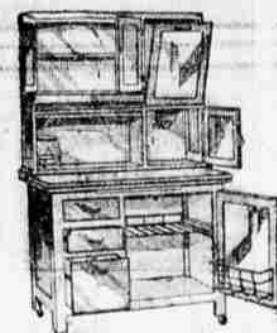


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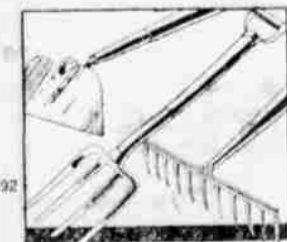
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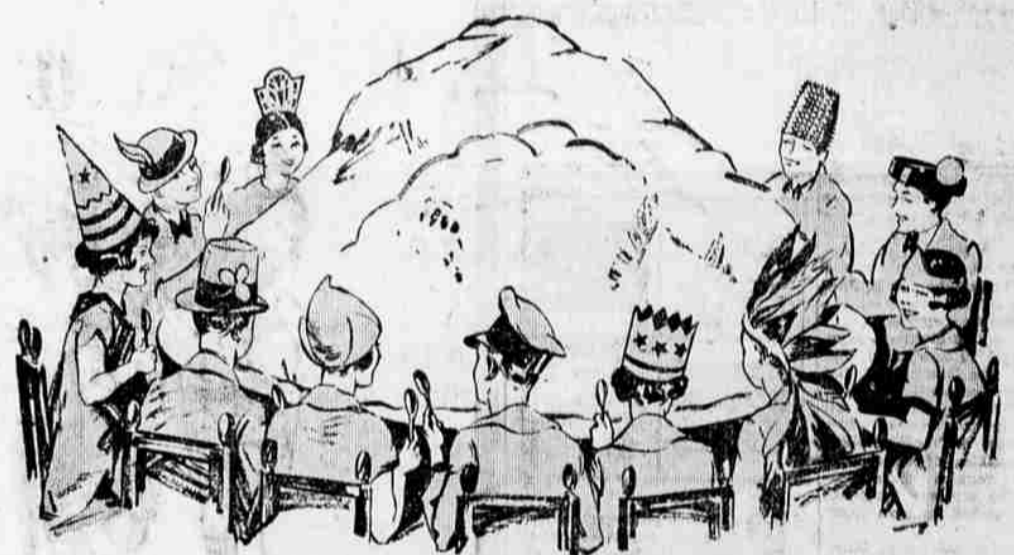
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Note: See "Smudge Smoke" for free translation of this "Gumbji" (not a soup) middle link in my name, as the story goes.

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