

Aluminum Gas Pipes

Light, thin-walled drawn aluminum tubing, which can be bent at right angles instead of having to be cut and screwed into angle fittings, is coming into use in Germany to replace the old-style heavy iron pipes used in houses for carrying cooking and lighting gas.

It is claimed that the new tubing can be used in considerably smaller sizes than iron pipes not only because of its thinner walls, but because it is completely smooth inside and therefore offers less resistance to the flow of the gas. It is also much less unsightly than the old pipes.

Angles are bent in it at any desired point by means of a special hand-operated tool employing a clamp and two channelled rollers. Where joints or T-fittings are necessary, self-sealing aluminum castings are used.

The tubing is made in sixty-foot lengths, which can be coiled up and carried over the workman's shoulder if necessary, thus reducing the expense of cartage and eliminating the traffic dangers attendant to having long lengths of stiff piping sticking backward out of a truck.

Engineering
Science News-Letter, March 29, 1930

School Reading

One of the classic criticisms leveled for forty years against the education of children in the United States has been tested and found to be no longer true, Dr. Charles H. Judd, of the University of Chicago, showed in an address before the meeting of the Department of Superintendence of the National Education Association.

It was in 1890 that President Eliot of Harvard startled everybody by his assertion that all the reading material covered by children in a typical public school in the third to eighth grades could be read aloud in 46 hours. After forty years, Dr. Judd has checked up to see whether the reading matter in school courses is still worthy of criticism as a thinly skimmed product. Dr. Judd asked teachers of fifth grades to estimate the amount of reading material covered by their pupils.

"I find that the amount of reading mastered in the average present-day fifth grade is eight or more times as great as that reported by President Eliot," he reported.

"The meaning of these facts is clear. Even if we make our comparison without regard to such additions to the curriculum as the arts and the special subjects such as physical education, the difference in quantity of reading shows that there has taken place within the last four decades a great expansion in the content of in-

struction in American schools. This expansion of the curriculum has been necessary to keep education abreast of expanding civilization.

"The demands made upon the individual in our times for a broad view of the world are so far in advance of those which were imposed on the common man in 1890 that the elementary school has been compelled to enlarge its offerings much beyond what was provided a generation ago."

Education
Science News-Letter, March 29, 1930

Conservation

Every leaf you pluck costs you a piece of your shirt.

This stringent and fantastic penalty was exacted for violating the protection bestowed by an emperor on a tree. The tree was an ancient lime-tree that stood in the town of Adelsheim in Baden, and the Emperor Ruprecht decreed its perpetual protection in 1401. So strong was the tradition of this medieval enactment that even at the beginning of the nineteenth century offenders were still penalized for plucking twigs or leaves; although a modification of the original rule, almost as fantastic as the emperor's whimsical decree itself, let offenders off with whole shirts if they would buy ribbons and tie them to the tree.

By 1857, however, the tree had declined to such a ruinous state that it had to be cut down, and for fifty years or so its place stood empty. Now, however, a new lime-tree grows where the "emperor's tree" once stood.

Forestry
Science News-Letter, March 29, 1930

Storing Electricity

A mythical storage battery of enormous size in which electricity could be stored during times of its abundance at flood seasons or off-peak load periods and from which it could be drawn during dry weather and heavy demand is no longer a mere dream of engineers.

Such a device, though scarcely resembling a storage battery, has recently been put in operation in the United States. It cost about \$6,000,000.

In discharging, it will supply 32,160 horse-power continuously for 1,116 hours. In charging, 3,105 hours are required to return this enormous amount of energy.

It is the Rocky river pumped-storage hydro-electric plant of the Connecticut Light and Power Company. When power is abundant on the company's system, two huge 8,100 horse-power pumps, the highest power single centrifugal units in America, fill the storage reservoir by pumping water

IN VARIOUS

from the Housatonic river, one mile distant. Then at peak load when power is scarce, this water falls back through the power house, turning a 24,000 kilowatt generator.

In actual practice the pumps would have to operate only about 2,320 hours before the reservoir would be filled, because some additional water is supplied from a small drainage area.

Strangely, most of the electric power used to pump the water into the reservoir is supplied by a steam plant. The combined efficiency of converting the steam to electricity, of pumping the water with electricity and of using the water to make electricity again, is 61 per cent.

The storage reservoir is 10 miles long and one and three-quarter miles across at its widest point. It contains 6,210 million cubic feet of water useful in producing power. This water is between 200 and 230 feet above the turbo-generator.

This is thought to be the first pumped storage station in the United States, although several are in existence elsewhere. One has been installed recently for a German power plant near Niederwartha.

Electricity
Science News-Letter, March 29, 1930

Ingenious Smokers

Ambassador Dawes' famous "under-slung pipe, which was looked upon as the last word in radicalism in smoking utensils when first it burst upon the hazy horizon of nicotinic America, is tame and conservative by comparison with the multitude of pipes and other tobacco-using devices which have been invented by the natives of Africa and Madagascar. The dark inhabitants of the dark continent have added to the conventional pipe-material, wood and clay, such things as antelope horns, gourds of many species, bamboo, and a hole in the ground partly filled with water. Some of them have even been known to smoke their flintlock muskets, filling the priming-pan with tobacco and sucking the smoke out through the muzzle.

Three scientists of the Field Museum of Natural History, Berthold Laufer, Wilfrid D. Hambly and Ralph Linton, have made a study of tobacco and its use in Africa. They report that although the plant was not introduced until considerably later than its discovery in America, it is now

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smoked, chewed and snuffed all over the continent and on the neighboring big island of Madagascar. In most places everybody is a tobacco user—men, women and children alike. But a few tribes, mainly those under Mohammedan influence, abstain from tobacco or limit its use. On the other hand, some groups increase the potency of their smokes by adding jimson-weed or hemp, the latter plant having reached Africa from Arab sources.

One tribe includes in its tradition of the introduction of tobacco a tribute to the soothing qualities of the weed that would do credit to Ik Marvel himself:

"When you have had a quarrel with your brother, you may wish to kill him; sit down and smoke a pipe. By the time this is finished, you will think that death is too great a punishment for your brother's offence, and you will decide to let him off with a thrashing. Relight your pipe and smoke on. As the smoke curls upward, you will think that a few harsh words would serve instead of blows. Light your pipe once more and, when the bowl is empty, you will be ready to go to your brother and forgive him."

Customs

Science News-Letter, March 29, 1930

Warming the Walls

Principles of heating used in Roman villas 2000 years ago are being applied to homes today to produce conditions of the atmosphere excellently suited to the human body.

The Latins warmed their marble floors with underground flues and basked in the radiated heat. Now hot water pipes or electrical units installed high up on the wall or in the ceiling, invisible beneath the plaster, keep a room comfortable at a temperature as low as 60 degrees Fahrenheit and impart to its occupants a freshness and vigor lacking in warmer rooms.

This new form of heating, called panel warming, and the way it keeps a person comfortable at temperatures, the mere thought of which brings shivers to many, were told by L. J. Fowler, of London, before the recent International Heating and Ventilating Exposition.

Dressed in a bathing suit one can stand in the middle of a snow-covered field and experience no dis-

comfort, Mr. Fowler said, provided the sun is shining brightly and there is no wind. The heat of radiation directly from the sun and reflected from the snow is sufficient to keep a person warm even when the mercury has fallen, if there is no wind to carry heat from the body.

The same principle applies to the panel heated room, Mr. Fowler explained. Heat is radiated from the upper walls and ceiling, and one feels comfortable at a comparatively low temperature. The panels, which need to be only slightly warmer than the atmosphere in the room, do not set up draughts, as the more concentrated and hotter heat units do, to take heat from the body.

In a test conducted by Dr. Vernon, of the British Industrial Fatigue Research Board, the upper air in a panel heated room was found to be just one degree warmer than that near the floor. In an ordinary room this temperature difference is many times greater. The panels themselves were only two and three degrees higher than room temperature.

Modern panel warming is only 20 years old. It was first employed in England where it has been used in numbers of public buildings and the better residences. It is spreading to countries in Europe and other parts of the world.

The cost of installing panel warming is said to be little higher than that of a system employing enclosed radiators. Its continuous operation is considered reasonable, but intermittent heating with the panel system is expensive. When used constantly it is especially well suited to care for a sudden fall in temperature because heat is stored in the walls ready to combat the change.

Engineering

Science News-Letter, March 29, 1930

Smallest 'Possum

The world's smallest opossum, a tiny animal no bigger than a mouse, is a native of Argentina. H. Harold Shamel of the U. S. National Museum, who describes the new species in the *Journal of the Washington Academy of Sciences*, states that the specimen was collected some time ago by Dr. Alexander Wetmore, but that it remained unstudied until now.

The little opossum is less than five inches from nosetip to tailtip, and nearly half its length is accounted for by tail. The specific name given it is *muscula*, which means "little mouse." There are many species of mouse which are larger.

Zoology

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Interference

It is next to impossible for the radio enthusiast who lives within a few blocks of a high-powered station to get a distant program.

That is just what the aviator has to do, only the interfering broadcaster is within a few feet of his supersensitive receiver. In fact, it is the engine.

The U. S. Bureau of Standards has effectively silenced this local broadcaster, the engine ignition system, by sheathing it and all its parts and wires in metal.

The wires are housed in a liquid-tight flexible metal tubing with a surrounding layer of copper braid to insure sufficient shielding. Water-tight fittings are provided at both the spark plug and magneto ends.

Engine interference is successfully eliminated from sets having an overall voltage amplification of about 3,000,000 to 5,000,000. The assembly is now in commercial use.

Radio—Aviation

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Raising Wood Crops

Several hundred acres of waste land in the eastern part of the United States have been planted in hybrid poplar trees which will yield a crop of pulp wood for the paper industry comparable in value to the financial return from flaxstraw and cotton.

This is the first practical application of research conducted during recent years by Dr. Ralph H. McKee and others scientifically to increase America's diminishing supply of wood. Its success was described by Dr. McKee before the Franklin Institute recently.

The new hybrids will produce from 10 to 14 times as much wood per year as wild poplars growing under similar conditions, their studies disclose. In 60 years natural reforestation yields about six cords of useful wood per acre, or 125 pounds of cellulose a year from each acre, it was pointed out. The yield per acre-year for cotton is 150 pounds of cellulose, for flaxstraw 100 pounds and cornstalks nearly 500 pounds.

"Well managed reforestation plantations of pulpwood using wild species produce about 2,000 pounds of cellulose per acre-year," Dr. McKee said. "From the new hybrid poplar plantations we have every reason to expect 80 cords of pulpwood per acre in 12 years, that is, an average of about 16,000 pounds of merchantable wood per acre-year, equivalent to 8,000 pounds of cellulose."

Forestry

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