MUELLER RECORD

MAY • 1949 • JUNE

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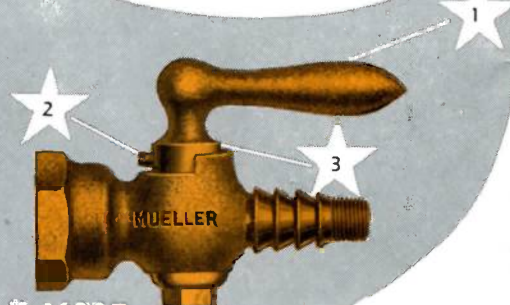

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MUELLER RECORD

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May • 1949 • June
Vol. XXXV No. 6
GENE J. KUHN, Editor

CONTENTS

COVER
Harold M. Lambert Studios
Philadelphia, Pa

MOSTLY PERSONAL

FRANK J. McDONOUGH, the man in charge of Chicago's pumping stations, was mentioned last issue as one of the staunchest friends of the city's old water tower at Michigan and Chicago avenues. What we didn't know at the time was that Mr. McDonough has quite an interesting history himself.

For one thing, Mr. McDonough, who is 70 years old, has been a city employee for 49 years, having started in the city engineer's department in 1900 while a student at Rush Medical College.

Furthermore, he also has the right to sign his name Frank J. McDonough, M.D. It seems that Mr. McDonough ran out of money while attending the medical college, a serious situation at the time, since he wanted to get married. He took a city civil service examination, got a job at $75 a month, was married, and finished medical school nights at Chicago Medical College. He couldn't afford to look for a practice or become an interne, so he then enrolled at Lewis Institute and took a mixed course in engineering, specializing in the mechanical branches. This enabled him to pass another examination for a position as a junior engineer, and a few years later he was assigned to the operating division, which included the pumping stations.

(Continued on page 20)

A ROARING WELL.

Gas, Oil & Developing Company Struck a Powerful Flow of Gas Monday Morning

9,000,000 FEET VOLUME.

Two Feet of Coal Penetrated at a Depth of 165 Feet.-- Excitement at a High Pitch Over the Discovery.

Between 9 and 10 o'clock Monday morning, drillers for the Gas, Oil & Developing Company tapped the gas sand and opened up a howling gaser at a depth of near 500 feet.

Conservative estimates of the flow place it at 9,000,000 feet daily. The

concerns, the inducements Dexter now has to offer.

P. H. Albright will run an excursion from Winfield today. He telephoned Tom Nicholson Tuesday to prepare dinner for seventy.

THE DEXTER ADVOCATE, MAY 14, 1903

Dexter's Hot Air Well

There was only one thing wrong with the gas brought in near the small Kansas town—it just wouldn't burn.

THE RESIDENTS of Dexter, Kansas, had every reason to believe prosperity had not only rounded the corner but was full upon them that day in May, 1903, when a spurt of mud and water ushered in a strong gas flow at the discovery well drilled by the Gas, Oil & Developing Company.

When the well blew in, the drillers were about eight feet away, sharpening a bit at the forge. Their first thought, after the startling realization that they had a successful strike, was to extinguish the fire in the forge before the powerful stream of gas blazed up, adding to the difficulty of bringing it under control. Within a matter of seconds they had grabbed buckets and cans and thoroughly doused the fire with water and dirt.

Dexter's well was as "a cyclone to a mild wind" compared to the well at nearby Winfield, the county seat, the editor of *The Dexter Advocate* exulted. His elation was such that he could picture the transformation of the raw little town in southeastern Kansas into a busy industrial center. Industry, he thought, would not overlook the vast source of cheap fuel and power indicated by the well.

"We cannot refrain," he wrote, "from again impressing upon our citizens the importance of the speedy organization of a commercial club and combined effort to impress upon men of capital looking up locations for industrial concerns, the inducements Dexter now has to offer."

And as for the immediate advantages to be realized, he assured his readers, "King coal will be displaced as fuel in

Dexter. The company can comply with the franchise granted by the council last winter and our citizens will toast their toes by a gas fire next winter. The comfort and convenience of it will never be fully realized until tried."

On the basis of past experience in the development of new gas fields, the editor had a right to be optimistic. The only trouble was, as he and others who shared his enthusiasm were to find, the Dexter well's performance was to be unlike any other that had been brought in up to then. But in those first few days after the strike they had no reason to suspect that.

Word of the discovery was flashed to surrounding towns by telegraph and telephone, and within a few hours' time news that the well was a producer had been spread throughout the state. The afternoon train was crowded with those who saw a means of exploiting the wealth that must follow such a strike.

Several thousands of shares of stock in the company were sold in Dexter that afternoon, and W. E. Merydith, one of the company members, easily disposed of a similar amount in Winfield. Enthusiasm was high in both Dexter and Winfield, the residents of Winfield reasoning that even if the Dexter well did have a stronger flow than anything brought in around Winfield, it was at least in the same county. What would benefit Dexter must surely benefit Winfield.

The company secretary, J. H. Bagnall, left for Independence, east of Dexter, where other gas wells had been producing for some time, and returned with packers to close in the well. They experienced little difficulty, and they expressed their thankfulness that fire had not complicated their work.

With the flow under control, the company decided to give the people a show for their money. Accordingly, it was announced that the well would be touched off and allowed to burn for a time, thus providing a fitting demonstration, which might possibly serve to sell additional shares of stock.

The crowd kept back at a respectful distance as one man applied a torch while another carefully cracked open a valve. The gas, which had a rock pressure of 110 pounds per square inch, screeched through the valve, but, instead of igniting, it merely blew out the torch. The men looked at each other questioningly, but they figured the torch had simply been extinguished by the velocity of the stream of gas. The valve was closed, the torch lighted and applied, the valve eased open, and again the blast of gas blew out the torch. This was repeated several times with the same result.

"Must be a hot air well," one of the Winfield boys chortled.

But there was little humor in the remark to others in the crowd who had put up hard-earned cash to buy stock in the company. Some of the more timid began to unload their stock at reduced prices.

The demonstration was called off, and members of the company ineffectively tried to explain the failure of the gas to ignite. The editor of *The Advocate* printed what was perhaps the official version, which stated the gas would not burn "owing to the high pressure of gas within and the high wind without."

There really wasn't anything to worry about, Mr. Bagnall assured the editor, and he, for one, would lose little sleep over the failure. All that was required to conduct a proper demonstration, he said, was a regulator to cut down the pressure.

One of the drillers had a slightly different explanation. The gas, according to a statement he made to the editor, was almost entirely free of sulphur, but outside of that it was the "pure, dry, natural article." It merely lacked the "highly combustible elements of the ordinary sulphurous gas most generally found in gas wells." This, the editor was given to understand, was all in its favor. Dexter might still become an industrial city.

Another attempt was made to ignite the gas that night, but it too failed. The next morning a line was laid to a boiler and it was found that when a fire already was kindled in a fire box and the gas introduced, it would begin to burn, developing sufficient heat to generate steam moderately well. But as soon as the other fuel in the fire box was consumed, the gas would no longer burn.

The newspapers in that section of the state found the peculiar behavior of the gas an ideal subject for humorous articles, and the well received wide publicity —to the understandable annoyance of the company. The matter came to the

Thirty-six persons perished when the hydrogen-filled Hindenburg caught fire at Lakehurst, N. J.

ACME PHOTOS

A misshapen steel skeleton, resting on blackened earth, was all that remained of the giant aircraft.

attention of the state geologist, who deemed an investigation in order.

On his advice the well was opened and allowed to flow freely for 11 days through an 8¼-inch pipe, then through a 3-inch pipe for three more days. After that the gas was tested by trying to use it again in boilers and stoves. But it still would not burn. The well was reported to have a flow of seven million cubic feet each 24 hours.

A sample of the gas was then shipped to the University of Kansas for analysis. Erasmus Haworth and David F. McFarland found that the primary reason the gas would not ignite was its high nitrogen content. Only slightly more than 15 per cent of the gas was combustible, as compared to more than 70 per cent of nitrogen and an inert residue which could not be immediately identified.

Dr. Hamilton P. Cady, a young associate professor of chemistry at the university, became interested in the gas situation at Dexter. He and Professor McFarland obtained additional samples of the gas and ran detailed analyses. In his first report, Mr. McFarland had hinted the residue might contain argon, but neither of the scientists expected at the start of their work that they would find helium, which had been discovered in the sun by Janssen, a French astronomer, in 1868. When they published the results of their work, the report that the Dexter gas had a helium content of 1.84 per cent created something of a stir in the scientific world. But the discovery was of little interest to the public, including those residents of Winfield and Dexter who still owned stock in the well. *The Advocate's* editor admitted editorially, "What next will be found in Dexter gas is a question that puzzles us."

Until World War I was at its height, there seemed to be no practical use for helium. The Germans were using Zeppelins for bombing raids on England, and a means of retaliation was sought. Retribution in kind did not appear to be the answer. The ships carried a formidable bomb load, but this was offset to a great extent by the fact that they were being inflated with high inflammable hydrogen, making the cumbersome craft a perfect set-up for an incendiary shell.

Dr. Cady's work with helium was recalled, and the government belatedly set about obtaining a supply of the gas. By the time the plants were built and extraction methods perfected, the war was nearly over. Helium never entered the fight. When the Armistice was signed, the first supply of helium was on the dock, ready to be shipped to France.

The war had stimulated interest in lighter-than-air craft, and at its end the major nations began exploring the possibilities of using the ships for long distance commercial flights. A race to build larger and ever larger ships started in the 1920s, culminating in such giants as

U. S. NAVY

Helium-filled blimps, patrolling convoy lanes, were one of the weapons used to win the Battle of the Atlantic during World War II, when Allied ships were being sunk at an alarming rate.

the USS Akron, the USS Macon, and the Hindenburg, which was Germany's pride. However, the percentage of disasters among the craft was so high the program was all but abandoned after 1936. Thanks to helium, fire was not one of the hazards of ships of the United States, which maintained a miserly control on its world-wide monopoly.

The Akron and Macon each had a capacity of six and a half million cubic feet of gas, making them the largest dirigibles in the world at the time. The Akron, commissioned late in 1930, plunged into the sea off the New Jersey coast on April 4, 1933. There were only three survivors among the 76 officers and men aboard. The Macon was wrecked off Point Sur, California, in February, 1935, as she was returning from fleet maneuvers in the Pacific. Fortunately, only two lives were lost, 81 survivors being picked up by warships.

The Hindenburg disaster marked the end of an era for the huge airships. The Hindenburg, which had a gas capacity of 7,063,000 cubic feet, was the largest lighter-than-air ship in the world. She measured 811 feet in length and had a diameter of 135 feet. She had made ten trans-Atlantic trips during 1935, carrying upwards of 70 passengers a trip. On her first crossing in 1937, she caught fire as she was mooring at Lakehurst, New Jersey, on May 6, and 36 persons lost their lives.

The United States was sharply criticised for being so niggardly with its helium as a result of the Hindenburg tragedy. However, it went right on guarding its supply. Helium was an ace in the hole that might some day be put to good use.

When World War II came along and German U-boats were sinking ships within sight of our own coast, the Navy turned again to lighter-than-air craft. No attempt was made to build large ships. Instead, efforts were concentrated on small craft — blimps — for patrolling convoy lanes. The blimps were ideal for spotting lurking submarines. Patrolling for many hours longer than airplanes, they provided highly effective convoy coverage. Helium had an important role in this war, for the blimps were an important factor in winning the Battle of the Atlantic.

Helium, which also is found in Texas, Utah and New Mexico, still is in limited demand. In addition to military purposes, industry and medicine use it to some extent, but the total is only a small fraction of what could be supplied.

Dexter itself has received little or no benefit from its hot air well. No industries ever found their way to the town. The editor of *The Advocate*, if it had not long ago been forced to suspend publication, might now remark: "What next will be found as a use for helium is a question that puzzles us."

A History of Boston's Water Supply

Meeting the needs of a population which doubled every 30 years has been a continuous problem for the system.

II

DURING 1849, the first complete year of operation of Boston's public water supply, the average daily consumption was 3,680,000 gallons; ten years later it had increased to 13,175,000 gallons; and in 1861 it reached 18,189,000 gallons.

With the decision to develop Lake Cochituate for a water supply for the rapidly growing city of Boston, a policy of taking water from clean, unpolluted upland watersheds was established as being the most practicable method of providing a safe and acceptable water supply.

An increasing consumption of water, and the continued growth of the city, made it evident that the Cochituate supply would have to be supplemented. It was necessary for the city to make a contract in 1869 with the city of Charlestown, then a separate municipality, to receive water from the Mystic Water Board to meet the demand.

It was not until 1871 that active steps were taken to seek a new source of supply. On April 8, 1872, Governor W. W. Washburn, signed the Sudbury River Act for an additional supply from Sudbury River and Farm Pond in Framingham, thereby authorizing the Cochituate Water Board to divert the waters of the Sudbury River in Framingham. The act provided for the construction of seven storage reservoirs on the river, and a 17-mile conduit, now known as the Sudbury Aqueduct, through which water was to be conveyed to Chestnut Hill reservoir.

With the annexation of Charlestown, West Roxbury and Brighton in 1874, the Cochituate and Mystic Water Boards were united; and in 1876 the Boston Water Board was created, succeeding the Cochituate Water Board.

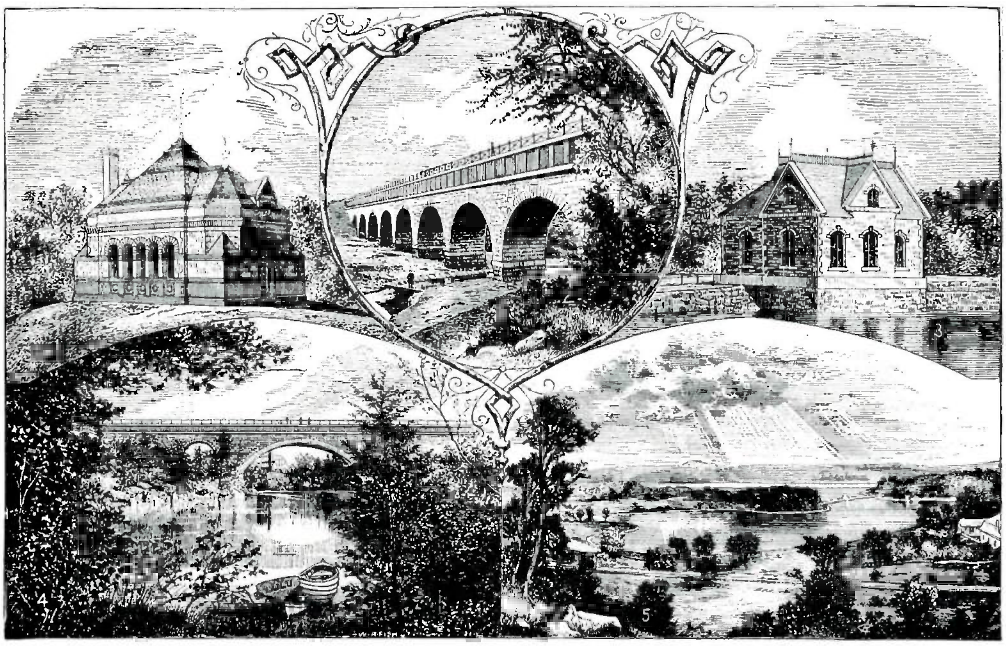
About 1890 it was realized that further additions would have to be made to supply the increasing needs of Boston. Also, the cities and towns around Boston began to feel the inadequacy of their water supplies.

In 1893 and 1894 an intensive study was undertaken by the state board of health relative to procuring a water supply for the city of Boston and its suburbs. The report recommended the creation of the Metropolitan Water District and the immediate construction of a storage reservoir by impounding the Nashua River, an aqueduct capable of conveying 360 million gallons a day, another aqueduct—Weston Aqueduct—capable of conveying 300 million gallons a day, pumping stations, and a system of supply pipe lines to various cities and towns comprising the district.

The first contract awarded by the newly-created board was for the construction of the Wachusett Aqueduct on February 14, 1896. Water was first turned from the Nashua River into the completed aqueduct on March 7, 1898. Wachusett Dam, located in Clinton, is a gravity type structure, 944 feet long, with its top 20 feet above high-water level in the reservoir. The main dam is composed of rubble masonry. The height at the point of deepest excavation is 207 feet and the maximum thickness is about 185 feet. The Wachusett Reservoir has a watershed area of 107.69 miles. Generating equipment was installed in the lower gate chamber of the Wachusett Dam, and electric energy was produced for commercial use, for the first time, on August 10, 1911. This development of electric energy from a water supply was the first of its kind so far as we are able to ascertain.

At the beginning of the Metropolitan Water Board's activities it purchased the various storage reservoirs and aqueducts of the Cochituate, Mystic, and Sudbury systems from the city of Boston; also Spot Pond was purchased from the cities of Walden, Medford, and Melrose.

This is the second of two articles on Boston's water supply system. The author, James J. Matera, is senior civil engineer and superintendent of the Wachusett Section, Metropolitan District Commission.



BETTMANN ARCHIVE

Several views of Boston's early water system are shown in this old woodcut: (1) the gate house, Chestnut Hill; (2) Waban bridge, Needham; (3) gate house, Parker Hill; (4) Charles River bridge, Newton Upper Falls; (5) Chestnut Hill reservoir, completed in 1869.

Metropolitan Boston had a water system second to none in 1910. At that time the general assumption was that the then existing facilities and supply of pure and sparkling water would be sufficient to serve many generations to come.

However, in 1919, less than ten years later, the Massachusetts legislature asked for an investigation of the water supply needs of the commonwealth relative to increasing the available supply.

The joint boards of the state department of public health and the Metropolitan District Commission were given the responsibility of making the investigations.

Relative to the supply for the metropolitan district, the recommendations submitted in their report of January, 1922, were based on the original proposals and recommendations of the report of 1895, which stated that the chief reliance of the future water supply of the district was placed upon the use of the Ware and Swift rivers.

At this time the Metropolitan Water District included the city of Boston and 18 suburban cities and towns: Arlington, Belmont, Chelsea, Everett, Lexington, Malden, Medford, Melrose, Milton, Nahant, Newton, Quincy, Revere Somerville, Stoneham, Swampscott, Watertown and Winthrop.

The total population served by the district in 1920 was 1,252,903, including 748,060 in the city of Boston. Making comparisons at this date with the census records of the past, the figures show that the population has doubled in each period of 30 years, although for the last 30-year period, ending with 1920, the increase was about 89 per cent. Therefore, an estimated population growth of the district of 67 per cent was assumed for the next 30 years, ending with 1950. At the present time this figure will be closer to 50 per cent.

Much controversy arose at the time regarding the report.

In May, 1924, a report of the legislative joint standing committee on water supply was submitted. Further divided opinion evolved from this report relative to additional water supply for the Metropolitan District.

The Metropolitan District Water Supply Commission was created by an act of the legislature in 1926 and was given additional power and duties in 1927. An appropriation of $65,000,000 was made

This is a view of Winsor Dam, which is 2,640 feet long, and its administration buildings. The dam contains 4,000,000 cubic yards of earth fill, and is 170 feet above the river bed.

for the development of the Ware and Swift River watersheds as recommended in the report of the joint board in 1922.

The Quabbin Aqueduct, 24.6 miles long, 11 feet wide, and 12 feet, nine inches high, of horseshoe shape, with a capacity of 975 million gallons per day, was built from the westerly portion of the Wachusett reservoir in the town of West Boylston to the new Quabbin reservoir. A diversion dam on the Ware River, and other works necessary to provide for the diversion of water into the Quabbin Aqueduct, were built.

Quabbin reservoir, about six times as large as the Wachusett reservoir, was built in the valley of the Swift River with a storage capacity of 412 billion gallons at high water elevation 530. It is 18 miles long, with a water surface of 38.6 square miles, a shore line of 118 miles, and has a depth of 102 feet to the lower intake sill of the Quabbin Aqueduct.

The main dam, called Winsor Dam for the late chief engineer of the water supply commission, is 2,640 feet long, 170 feet high above the bed of the river, and 295 feet above the sound ledge foundation. It contains 4,000,000 cubic yards of selected earth fill above the original surface. A spillway, 400 feet long, with a crest at elevation 530 feet above the mean low tide fixes the high-water elevation of the reservoir.

Quabbin dike, located about three miles east of Winsor Dam, is 2,140 feet long, 135 feet high above the bed of the brook, 264 feet above the sound ledge foundation, and contains 2,500,000 cubic yards of earth fill above the original surface. Both dams were built with a concrete core wall foundation to sound ledge, and the fill embankments were built by the hydraulic fill method.

The impounding of water in Quabbin reservoir was begun on August 7, 1939; on May 30, 1946, water reached the crest of the masonry spillway at elevation 528. On June 22, 1946, a celebration was held commemorating the filling of Quabbin reservoir.

With the completion of the Ware-Swift River development for the Metropolitan Water Supply, the Commonwealth of Massachusetts had constructed one of the greatest engineering projects undertaken in this part of the country.

In 1938 an extensive report was made by the department of public health, working in conjunction with the Metropolitan District Water Supply Commission, relative to improvements in distribution and adequate prevention of pollution of sources of the water supply for the Metropolitan Water District. It dealt mainly with the pollution problems in the Cochituate, Sudbury and Wachusett watersheds, created by increased population and industrial activities on these watersheds.

Several recommendations were made for the elimination of sources of pollution which included the discontinuance of the regular use of water derived from the Cochituate and Sudbury watersheds, although use of the Cochituate supply for consumption in the district ended during October, 1931.

Another feature of the report was for the immediate construction of a pressure aqueduct, by-passing the Sudbury system and connecting the distribution system with a long-range plan for a tunnel loop which would reinforce existing supply mains, thereby eliminating considerable pumping.

On the basis of these recommendations the construction of the pressure aqueduct, now known as the Hultman Aqueduct, was undertaken by the Metropolitan District Water Supply Commission. The Hultman Aqueduct was first placed in service during October, 1940, making it possible to bring water from the open channel of the Wachusett Aqueduct directly into the distribution supply mains for district consumption, a distance of approximately 18 miles.

Now under construction is a portion of a tunnel which starts at the terminus of the Hultman Aqueduct in Weston. This section will be approximately five miles long, ending at Chestnut Hill in Brighton. When completed, existing pumping at Chestnut Hill for the southern high service distribution will be eliminated.

During 1947 the legislature gave authority to the Metropolitan District Commission to transfer to the department of conservation certain reservoirs in the Cochituate and Sudbury watersheds that were no longer used for water supply purposes. Included was Lake Cochituate from which no supply had been taken since October, 1931, as already mentioned.

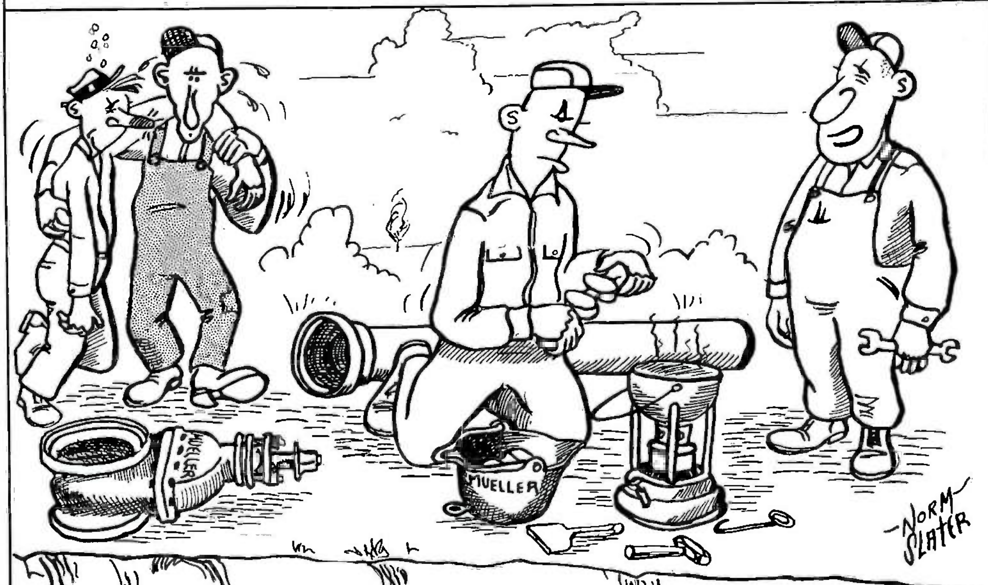
On June 30, 1947, the Metropolitan District Water Supply Commission was abolished, and all completed work was turned over to the Water Division of the Metropolitan District Commission for operation and maintenance.

It is interesting to note that the present vast system, capable of delivering about 300,000,000 gallons of water a day, has developed within a century from the Cochituate supply which was originally planned to furnish less than five per cent of the present supply.

The Metropolitan District Commission is comprised of William T. Morrisey, chairman, William F. Rogers, Joseph McKenney, Max Ulin, and John J. Grigalus.

Approximately 471 civil service employees carry out the duties required for the operation, maintenance and improvements of the water supply that make up the Water Division of which Harold J. Toole is director and chief engineer and Charles O. Clark is deputy chief engineer.

Liverlip and Leo



"Say, boss, did you send Leo for a joint runner?"

SLIDES SHOW LINE STOPPER PROCEDURE

SOON TO BE made available to gas companies through the Southern Gas Association are a series of 24 color slides and an accompanying wire recorded narrative which describes the procedure followed by the Alabama Gas Corporation, Gadsden, Alabama, in using a Mueller C-1 power-operated drilling machine, stopping machine, completion machine and welding fitting. In the operation shown by the slides, a new 2,300-foot section of main had been installed parallel to an old main and connected to it through a gate valve. The Mueller machines and line stopper fittings were used to cut off and plug the old main under pressure. The slides are a portion of a series shown recently at the Biloxi, Mississippi, convention of the association on new equipment and labor saving devices used by gas companies. The slides were contributed by Alabama Gas Corporation.

1. Tack welding the two halves of the fitting together on main.

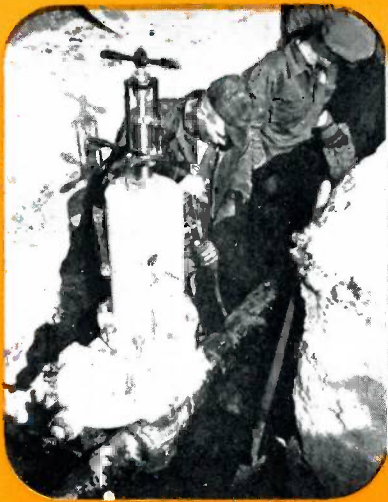
2. The fitting is now permanently welded in position on the line.

3. The valve adapter is securely bolted down on welded fitting.

4. Gate valve is attached to the adapter ready for drilling machine.

5. Cut is made into the line under pressure using a C-1 machine.

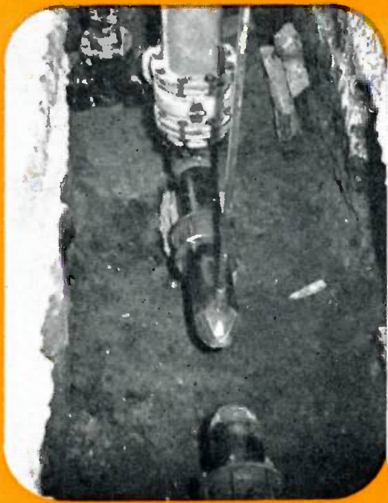
6. With gate valve closed, stopping machine is bolted to adapter.



7. Stopper is pushed down in position shutting off the gas flow.

8. Rubber stopper is holding the pressure and the main is cut.

9. Installing clamp over coupling; bull plug is vented for safety.



10. View of the plug and coupling before welding on clamp.

11. Completed job showing clamp welded in place, vent capped.

12. Stopper is raised; gate valve being closed to remove machine.

13. Stopping machine is removed; gate valve is holding pressure.

14. Completion plug is inserted by inserting and extracting machine.

15. Threaded plug installed; completion cap is then bolted to fitting.

Along this 1,200-foot runway, 40-foot sections of pipe were welded into 1,000-foot sections, five of which were then welded together for towing into the bay.

These floating oil drums support nearly a mile of pipe, submerged during towing. Tug, top center, can be seen towing a 5,000-foot section of the pipe line.

Underwater Pipe Line to Provide Power for Alcoa Reduction Plant

Gas from offshore wells to be used as fuel to generate electricity at new Point Comfort, Texas, works.

WHEN THE NEW Point Comfort, Texas, works of the Aluminum Company of America is completed next year, it will use natural gas from offshore wells in the Matagorda Bay field as fuel to generate the vast quantities of electrical power required for the reduction of alumina to metallic aluminum.

Gas from the wells will be transmitted through 13 miles of 8⅝-inch pipe, eleven miles of which are laid on the bottom of Matagorda Bay. The underwater pipe line is the longest and largest gas transmission line laid thus far to an offshore gas field.

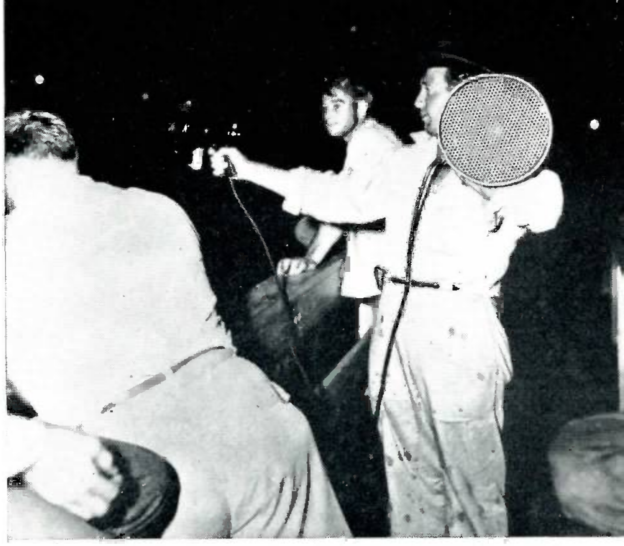
The gas will be used as fuel for 120 gas engines, each driving a generator for supplying direct current. The electrical generating equipment at the Alcoa plant will have a 120,000-kilowatt installed capacity, and the operation of the plant will mark the company's first peace-time use of electricity generated by other means than water power to produce aluminum, except for a brief period in the earliest days of the industry.

The production of aluminum from its ores requires large quantities of materials and great amounts of electric power. Aluminum is never found as a metal in nature, but is always tightly locked in compounds with other elements. Aluminum produced commercially in the United States today is obtained from a mineral known as bauxite. Alcoa obtains its supplies of bauxite ore from mines in Arkansas and in Surinam (Dutch Guiana), South America.

Four to six pounds of bauxite are required to make two pounds of alumina, which in turn is needed to make one pound of aluminum. In addition, three-quarters of a pound of carbon, 10 kilowatt-hours of electricity, and various quantities of other materials are consumed in the production of each pound of this metal.

Aluminum smelting is an electrochemical reduction process. The purified ore (bauxite) is dissolved by molten cryolite in tanks called "pots," and electric current is passed through the solution. This

A war surplus LCT, carrying a tractor boom, was used as a working platform to join the end of the section already laid to the latest seaward addition.



Sammy Collins superintended operations. Launching was often started in pre-dawn hours to take advantage of the comparatively calm water conditions.

separates the oxygen from the aluminum, and molten metal is deposited at the bottom of the pots. The aluminum is removed periodically, and is poured into "pig" molds to solidify. Later the metal is remelted and freed of non-metallic impurities. Alloying materials are added if desired, and the metal is then cast into ingots for further fabrication.

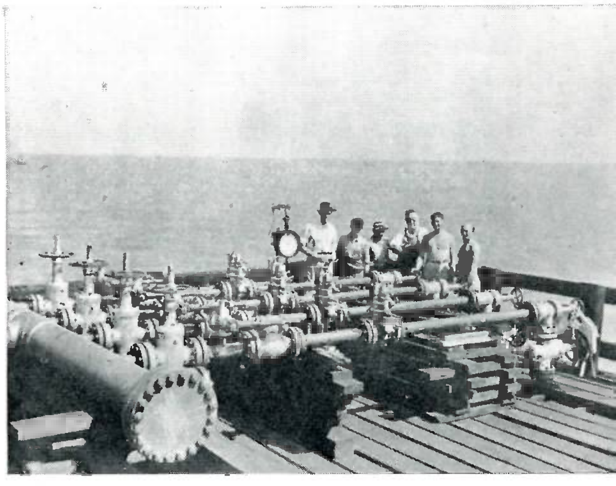
Contracts for the purchase of natural gas for the plant have been made by Alcoa with Stanolind Oil & Gas Company, The Texas Company, Amerada Petroleum Corporation, The Salt Dome Corporation, W. L. Goldston, W. J. Goldston, The Atlantic Refining Company, John R. Black, L. A. Grelling, Fidelity Oil & Royalty Company, The Mound Company, R. A. Welch, and the Francitas Oil & Gas Company.

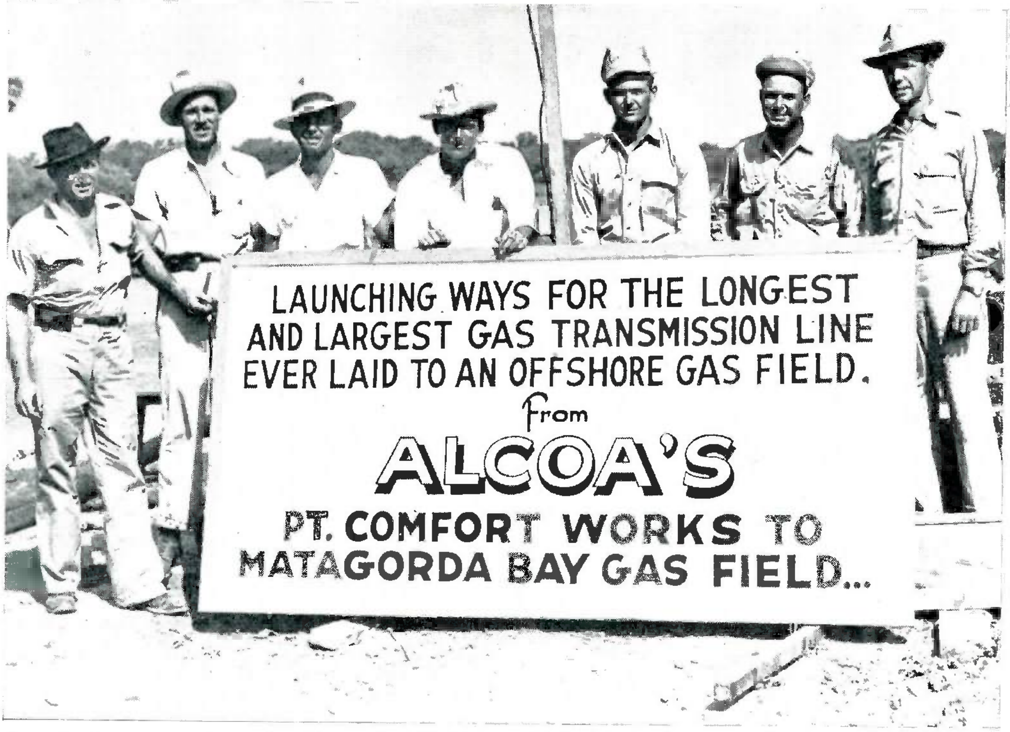
Actual laying of the pipe line from the metering station, where gas from six wells is gathered, was done by Continental Construction Company, Inc., of Port Lavaca, Texas. Its construction presented a number of problems to both Alcoa and Continental. The pipe had to be formed up in sections, launched, towed to location, welded to the sections already in place, and then lowered to the bottom of the bay.

Forty-foot sections of the seamless pipe were welded together on a 1,200-foot runway to form a section 1,000-feet long. When completed, these were placed on a greased launching way and oil

A Continental Construction Company welder on the LCT joins two 5,000-foot sections of the line at sea.

Gas from six offshore wells is gathered at this metering platform for transmission to Point Comfort.





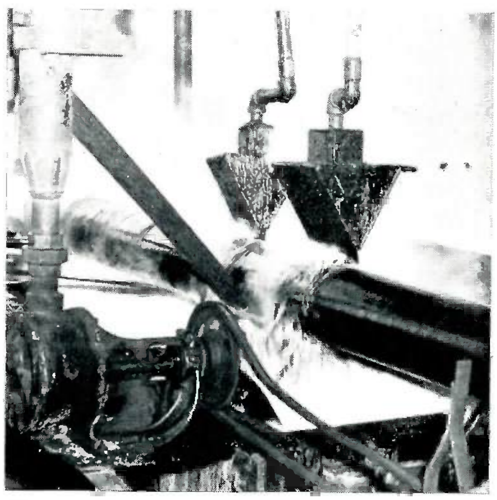
Posed at a sign which tells the story of the underwater pipe line are, left to right: Sammy Collins, superintendent of Continental Construction Company; Bill Alben, skipper of the LCT which served as a workshop out in the bay; Eugene Wright, now receiving clerk at Point Comfort; the McKinney brothers, welders; and John Castle, timekeeper on the big pipe line job.

drums were attached to serve as pontoons. As the 1,000-foot section was launched in the water, another 1,000-foot section was welded to it on the skidway, so that the process was continuous until a length of pipe 5,000-feet long had been welded into a single section.

The 5,000-foot section was then towed to the point where it would be joined to the portion of the line already laid. Welders aboard an LCT joined the sections, which were raised by means of a tractor boom on the craft. In the shallow water of the bay a man could easily dive below the surface to locate the submerged ends of the sections.

To take advantage of calm weather conditions, much of the launching work was done at night. Sammy Collins, vice-president of Continental Construction Company, relied on a signal lamp and a portable bull horn in superintending operations.

Gathering lines to the six wells and the transmission line were completely installed, tested, and pressure on the line built up on October 15. On the following day, the first electric power at Point Comfort was generated with gas from the offshore wells.



Pipe gets a coal tar enamel for protection against corrosion. A wrapping of glass mat, more coal tar, more glass mat and finally kraft paper were used in treating the pipe.

The pipe line will be operated by the Lavaca Pipe Line Company.

Nature Gives Canton A Helping Hand

A. E. Ransom, water superintendent, sees a pleasant summer ahead, thanks to city's underground reservoirs.

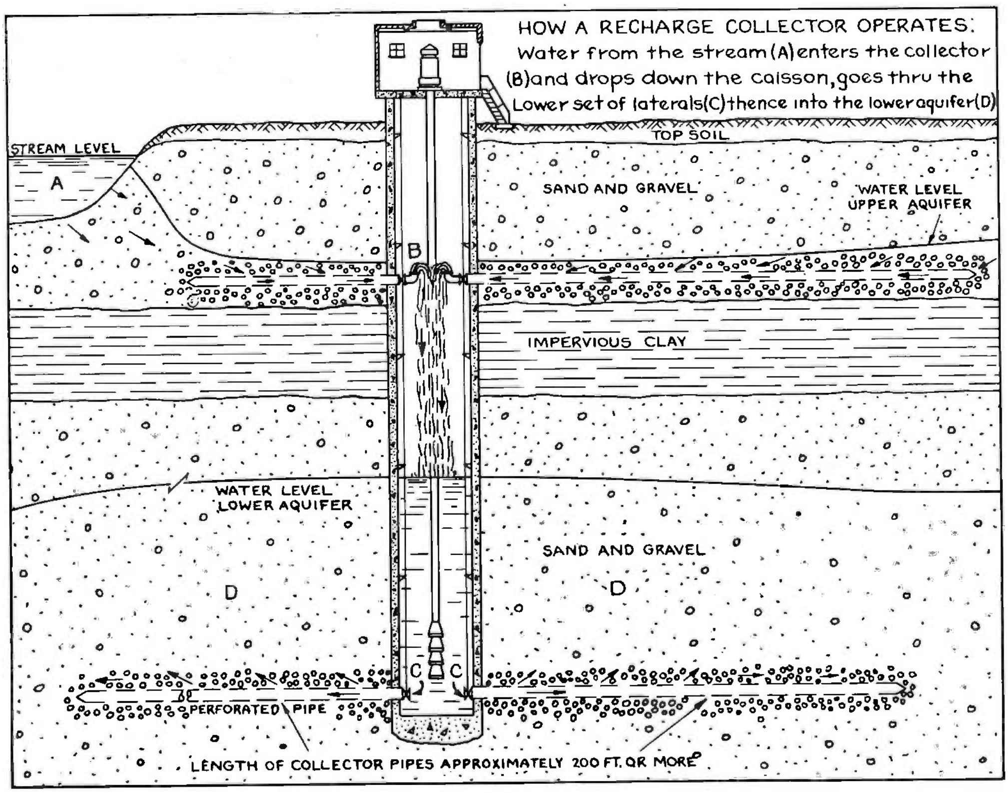
FOR MANY a water superintendent, the start of summer marks the beginning of a period of nagging worry over a possible water shortage. His worries increase in direct ratio with the advancing season. And by mid-August the shortage is not only a worry, it's an actuality. He pleads, prays, crosses his fingers, and keeps on worrying. Sometimes a serious shortage is averted by chance, by divine intervention, or by customers who finally decide the superintendent really is in earnest and resign themselves to letting their lawns burn up, taking fewer baths, and practicing other irking economies.

A. E. Ransom, superintendent of the Canton, Ohio, water department, has the greatest sympathy for those who find themselves up against this problem every summer, for he knows how it is at first hand. As a matter of fact, he had a taste of it last summer, but relief came at the last minute. He's confident that this summer will be different, and that his supply worries are over for a few years at least.

Nature, some engineers, and a couple of geologists are responsible for this respite from his regular summer worry, which was becoming an occupational disease.

This happy state of affairs dates back to February, 1947, when a survey was completed by the Raney Method Water Supplies Co., Columbus, Ohio. The city had been bracing itself for an outlay in the neighborhood of $6 million for a dam to impound surface water, and the firm's report was more than comforting.

The company's engineers, along with geologists of the U. S. Geological Survey and the Ohio Water Resources Board,



had found two water-bearing strata beneath the city in which from 10 to 15 million gallons of water could be trapped for use. The two strata were separated by an impervious layer of clay five feet thick.

"Why not," the report suggested in effect, "use these two immense underground reservoirs. Nature has equipped them with filtration equipment and gravity power for moving the water. Furthermore, the cost of utilizing these natural reservoirs will be less than ten per cent of what a dam would cost."

The engineers reported that a large area of land around the west branch of Nimishillen Creek would lend itself to the use of a comparatively new idea in water storage systems.

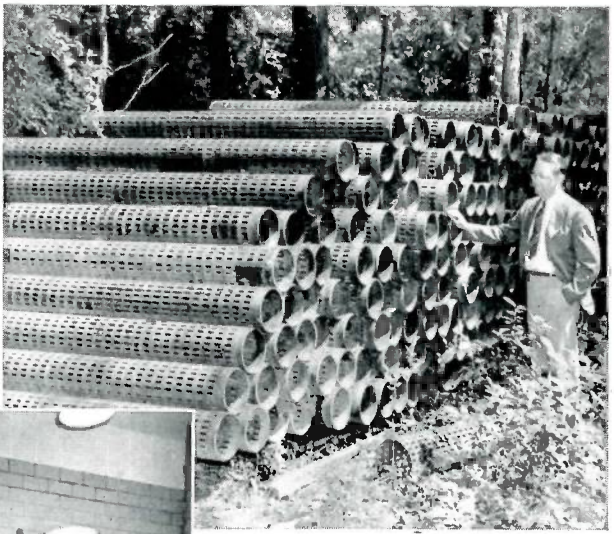
Forty acres were purchased, and preliminary drilling was started less than three months after the report was received.

Three huge caissons, 16 feet in outside diameter and 13 feet inside, were sunk into the field. Two were "collector wells" to feed surface water into the lower reservoir, and the third was equipped with three pumps, each having a capacity of five million gallons a day, for withdrawing the water.

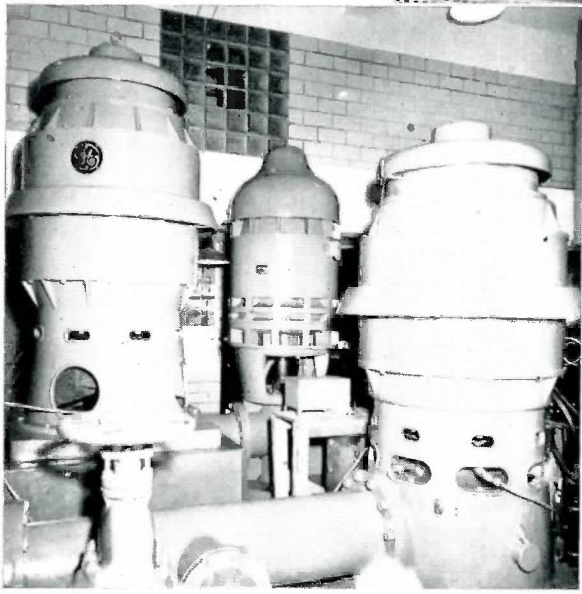
The collector caissons extended through the clay layer separating the reservoirs, 50 feet below the surface. They were equipped with 8-inch laterals, which extended into both layers of sand and gravel in all directions. The pumping collector was sunk 140 feet deep into the lower level.

As Mr. Ransom explains the method, the water collected in the reservoirs is surface water impounded and stored un-

One of the three caissons built for the Canton system. Two serve as collector wells, feeding surface water to the underground reservoirs; the third is equipped with pumps for withdrawing the water. The system was built for a fraction of the cost of a surface dam.



A. E. Ransom, superintendent of Canton's water department, is shown beside a pile of 8-inch perforated pipe, used as collecting laterals. These laterals extended into both layers of sand and gravel in all directions.



These are the pumps with which the pumping caisson is equipped. Installation of the first pump last August came just in time to avert a serious water shortage. With the installation of the other two, Mr. Ransom this year is looking forward to a pleasant, trouble-free summer.

derground instead of on the surface.

"This is accomplished," he said, "by inducing the infiltration of the water through the beds of streams, thereby using the natural filtration media of sand and gravel instead of building an artificial filtration plant. By doing this, the temperature of the water is kept at approximately 51 degrees.

"Normally the ground water is at stream level or above and discharges into the stream. Our system is to 'de-water' the area under the stream bed, allowing a portion of the water flowing in the stream to filter down through the bed to recharge the underground storage.

"Recharging takes place approximately six months of every year, the remaining six months, water is pumped from underground storage alone. We have to use both strata in the field in order to get adequate storage space during the recharging period.

"It operates just like a reservoir—you catch it at the flood and hold it for use later on."

Mr. Ransom put the first pump into service last August, right in the middle of the usual summer drouth. The level of water in the city's equalization basin was dropping at an alarming rate despite capacity operation at all existing pumping stations. Use of this first pump came just in time to stave off a major emergency, but it was still nip and tuck until the second pump was installed and in service. With three pumps to rely on this summer, Mr. Ransom is expecting a nice, uneventful summer, one that he'll enjoy for a change.

Off the . . Record . .

"Did you participate in many engagements on the Continent?" an inquisitive lady asked an ex-serviceman.

"Only seven," replied the former G.I. with becoming modesty.

"And you came through all of them unscathed?"

"Well, not exactly, ma'am," he replied sadly. "I married the seventh."

* * *

A 12-year-old boy entered a book shop and told the clerk he wanted a book for his younger brother. "How old is he?" the clerk asked. "Well," said the boy, "he's too old for the stork story and too young for the birds and bees."

* * *

"I'll give you five dollars if you'll let me paint you," said the artist.

The old mountaineer shifted his chaw from one side of his jaw to the other and back again.

"It's easy money," the artist insisted.

"Thar hain't no question about that," the mountaineer replied. "I was jes' a-wonderin' how I'd get the paint off afterward."

* * *

"Doctor, isn't it out of your way to visit me here?"

"Not so much. I have another patient nearby, so I'm just killing two birds with one stone."

Recruiter: "You can follow your regular trade in the Navy."

Recruit: "But I'm a cowboy."

Recruiter: "That's all right. You can ride the range in the galley."

* * *

"Daddy, is 'water works' all one word, two words, or do you spell it with a hydrant?"

* * *

A party of tourists in Arizona came upon an Indian brave riding a pony, while his heavily burdened squaw walked along beside him.

"Why doesn't the squaw ride?" asked one of the tourists of the Indian. "Her got no pony," was the reply.

* * *

"Tommy Hagan will not be in school today."

Teacher: "Who is this speaking, please?"

"This is my father speaking."

* * *

The officers of the ladies' auxiliary are still trying to find who was responsible for the following announcement on last week's bulletin board:

"The women of this organization have cast off clothing of all kinds. Come and see them any time this week."

* * *

"Mama, if I get married will I have a husband like daddy?"

"Yes, dear."

"And if I don't get married will I be an old maid like Aunt Minnie?"

"Yes, dear."

"Mama, it's a tough world for us women, isn't it?"

"They'll wait a long time before I'll pay $25 for a pair of shoes --- say, here's a cute pair for only $24.50!"

"Would you object to my selling chances around the office on you for a dinner, theater and night club date?"

A home owner, wearing his oldest clothes, was out cutting the lawn when a woman in a brand new car stopped and shouted:

"What do you get for doing yard work?"

The owner looked back at his house and then at the woman.

"The lady of the house lets me live with her," he said.

* * *

A man and his little girl were among the passengers in an over-crowded elevator. Suddenly a lady standing in front of the man turned around and slapped him. Before he had a chance to ask why he deserved such treatment, the woman had left in a huff. The little girl, however, innocently explained the whole incident by saying, "I don't like her either, daddy. She stepped on my toe, so I pinched her."

* * *

They laughed when he sat down at the piano, but when the little blonde gave him the key to A flat, how he accompanied her!

* * *

Groom: "Have you kissed the bride?"

Best Man (absently): "Oh, yes, hundreds of times."

* * *

The patter of little feet was heard at the head of the stairs. The hostess motioned for silence. "Listen," she cooed, "the children are going to deliver their good night message."

There was a moment of hushed expectancy. Then: "Mom! Willis just found another bedbug."

Office boy: "Excuse me, sir, I think you are wanted on the phone."

Boss: "You think! Don't you know?"

Office boy: "Well, sir, the voice at the other end said, 'Hello, is that you, you old idiot?' "

* * *

"I feel sure, my poor man, it was poverty that brought you to this," said the kind old lady visiting the state prison.

"No, ma'am, quite the contrary," answered the prisoner. "I happened to be coining money."

* * *

Spinster: "So this waiter says to me, 'How would you like your rice?' "

Friend: "Yes, yes, go on."

Spinster: "So I says, 'Thrown at me, big boy.' "

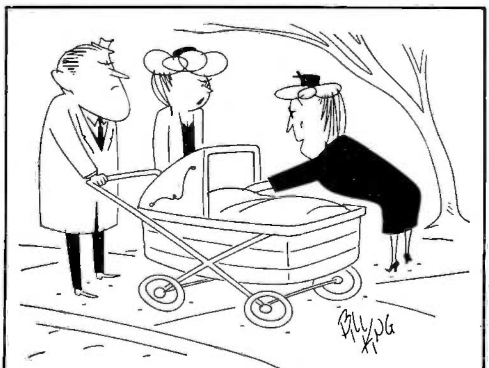
* * *

A young woman who had recently taken charge of a kindergarten entered a trolley car and, as she took her seat, smiled pleasantly at a man sitting opposite. The man raised his hat, but it was evident that he did not know her. Realizing her mistake, she said, in tones audible throughout the car, "Oh, please excuse me. I mistook you for the father of two of my children." She left the car at the next corner.

* * *

A sign in front of a shoe repair shop pictured several styles of rubber heels and a beautiful girl saying: "I'm in love with America's Number 1 Heel."

Underneath, in small feminine handwriting, someone had written, "Too bad, sister! I married him."



"My, what a beautiful, bright-eyed little darling! Oh, that's the doll---here's the baby!"

"You want them to stay or leave?"

Mostly Personal

(Continued from page 1)

The article, "Dexter's Hot Air Well," has a personal association. The late Dr. Hamilton P. Cady was chairman of the department of chemistry at the University of Kansas during the time the writer was an undergraduate and wanted to enroll for the first course in inorganic chemistry. However, the writer, being a foul mathematician, had side-stepped plane geometry in high school, and that was one of the requisites for the course. Dr. Cady kindly consented to write a note, waiving the requisite, but a hard-hearted dean said nothing doing. After an exchange of words, the writer caught the first train to Kansas City, took the inorganic chem course there, and returned to the university where he then proceeded to enroll for two other chemistry courses during his undergraduate years. To this day he is unable to understand why plane geometry should trip up college freshmen and sophomores who neglected to take the course in high school.

H. P. Cady

■ ■ ■

During the annual convention of the American Water Works Association earlier this month, we came across a photograph of delegates attending the nineteenth annual convention of the A.W.W.A. at Columbus, Ohio, May 16-19, 1899. Frank O'Dell, a veteran Mueller Co. representative, was able to identify three of the delegates: Hieronymus Mueller, founder of Mueller Co., and two of his sons, Adolph and Fred.

* * *

We are indebted to R. R. Suttle, managing director of the Southern Gas Association, for the loan of the slides used on pages 10 and 11. Black and white prints were made from the color slides, which show Mueller line stopper equipment in use. Those selected were among a series of 24 contributed by Alabama Gas Corporation.

Officers and department heads of the Quebec Hydro-Electric Commission met recently to honor Frederick H. Worrall, superintendent of services of installation, who celebrated his 50th year with the commission and its predecessors. E. E. Potwin, commission president, is shown congratulating Mr. Worrall. In the front row, left to right, are: Vice-president J. Arthur Savoie, Commissioner Raymond Latreille, Mr. Worrall, Mr. Potwin, Commissioner J. W. McCammon and Commissioner Rene Dupuis, surrounded by the chiefs of the various departments.

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