

MUELLER
Record
JUNE • 1959



“Go West—Then Wester!” . . . See Page 9



Recording Our Thoughts

THE Water Works Utility Advancement Program will take another giant step forward at the San Francisco convention in mid-July. This will be the first time since the inception of the program that its various phases have been employed for an annual meeting.

When you register, you'll learn that, with your co-operation, a news release and a photograph of you can be speeded back to your hometown while you are still in attendance at the convention. This phase of activity, the "Hometown News Program," is designed to bring recognition to you and your activities in behalf of the consumers you serve.

Monday morning, July 13, Session 1 will be devoted to water works development. Scheduled for discussion are: "Upgrading the Water Supply Industry," "AWWA's Water Works Advancement Program," and "Promoting Good Community Relations."

What's new in sea travel? An underwater cargo vessel of tomorrow is pictured in this artist's conception of a design now being worked out by Aerojet-General Corporation's Underwater Engine Division.

This issue of the RECORD contains a complete convention schedule, and you will notice that the pages are placed in the center of the magazine. This will allow you to tear them out, and keep them with you throughout the convention.

Coming up in the August issue of the RECORD will be what we think is a timely and important story that needs to be told and re-told—the story of Strategic Air Command and the part it plays in our national defense. This writer was privileged to visit Offutt Air Force Base outside Omaha in early-April. Offutt is SAC Headquarters, and a very impressive and interesting installation. The Office of Public Information at Offutt has been kind enough to furnish us with many wonderful photographs for display in the August issue, so we hope you will enjoy the story as much as we will enjoy bringing it to you.



MUELLER RECORD

JUNE • 1959

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OUR COVER this month shows you some of the fascinating sights offered by the AWWA's 1959 convention city—San Francisco. From left to right on the cover are Chinatown, with an estimated population of 30,000; the twin spires of the Golden Gate Bridge; and a typical view of Fisherman's Wharf, which will host conventioners with fabulous seafood dinners.

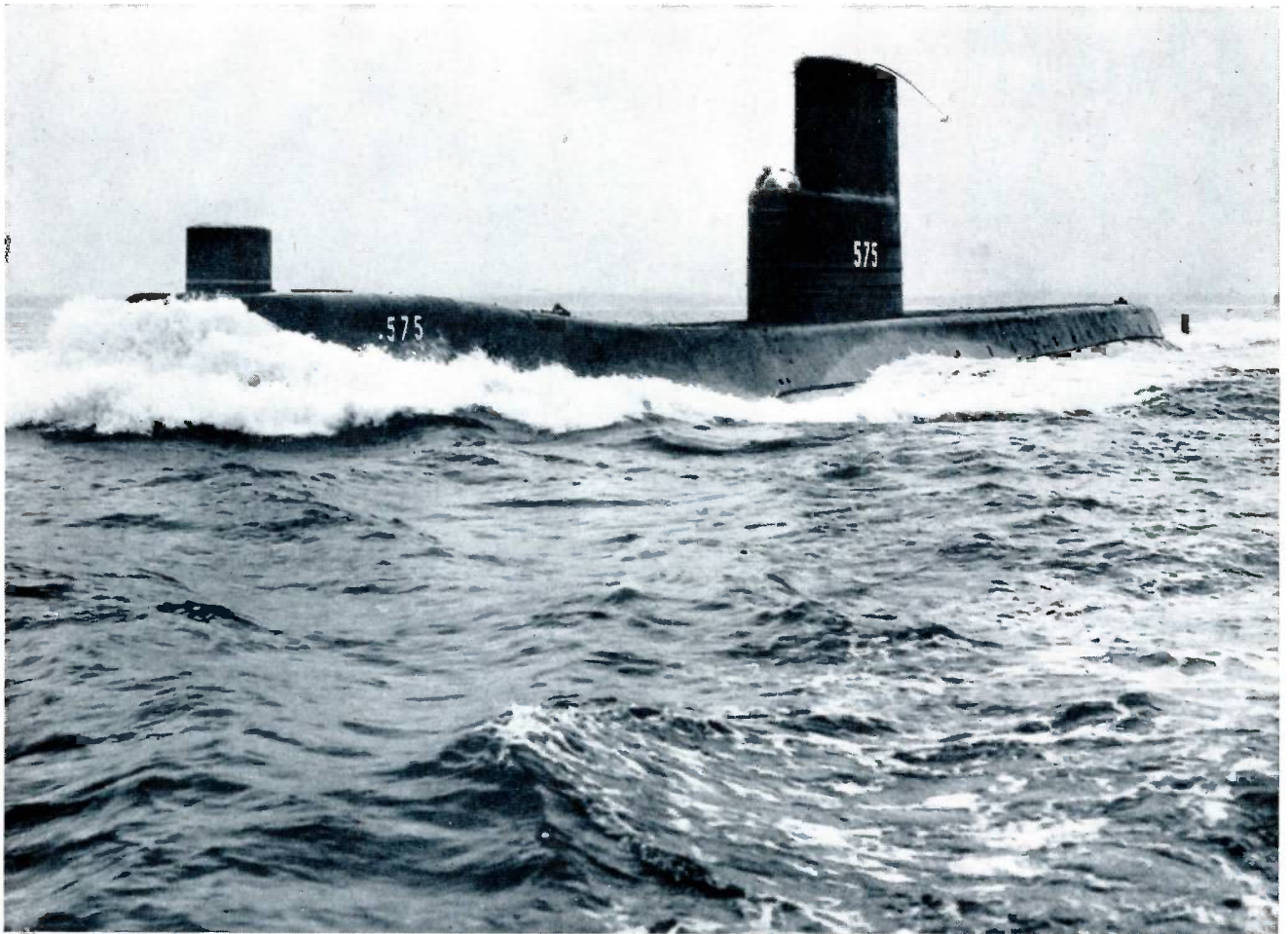
Contents

- 4 OUR HIDDEN DETERRENCE** . . . is a timely, authentic story concerning our nuclear submarine fleet.
- 7 AROUND THE WATER INDUSTRY** . . . keeps you abreast of recent developments in your field.
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- 9 SAN FRANCISCO—CITY WITH OPEN ARMS** . . . presents a preview of what's in store for water works people this July.
- 11 CONVENTION SCHEDULE** . . . is printed on removable pages for those who wish to keep an up-to-date schedule with them.
- 16 PUBLIC RELATIONS AT WORK** . . . in Wichita, Kansas, where Mueller products perform an educational function.
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Preview

The July-August issue of the **MUELLER RECORD** brings you material of interest to personnel in both the waterworks and natural gas industries, including a dramatic but reassuring account of the part Strategic Air Command plays in our defense effort.

This issue will also contain a post-card to be filled in by those readers who have had a change of address or title. We are attempting to keep our mailing list as accurate as possible, so your help will be appreciated.

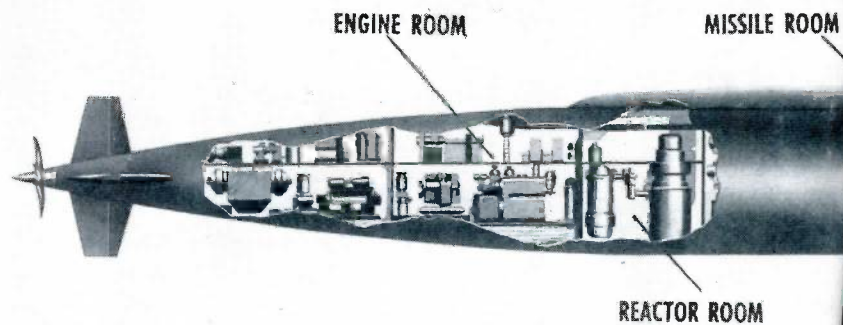


The atomic submarine, "Sea Wolf," one of the growing fleet of nuclear subs, makes a practice run somewhere in the Atlantic. It is capable of speeds in excess of 20 knots per hour.

Our Hidden Deterrence

While the United States and Russia compete for supremacy in outer space, this country's Navy is looking to the depths of the world's oceans as a launching element for new defense weapons that promise to be perhaps a more immediate deterrent to war than satellites.

The new weapons are a deadly refinement of the atomic submarine capable of roving the seas for months without refueling, and, perhaps more importantly, capable of accurately hurling, while protectively submerged, a nuclear-headed missile 1,500 miles to target. According to military authorities, a 1,500-mile range would encompass



approximately 85 per cent of the Soviet's industrial centers.

These same strategists do not rule out the possibility of Russia developing its own atomic fleet with nuclear weapons similar to our new Polaris program. But apparently U. S. has the jump on Soviet development. To date the Russians have not launched an atomic submarine, much less one equipped to fire nuclear warheads. This country's sixth atomic submarine was launched late last May and another 16 have been authorized. Keels are being laid for three of them to carry Polaris nuclear warheads of the 1,500-mile range variety.

However, in the field of conventional diesel submarines, Russia eminently is better equipped than U. S. At the last count, according to this country's best intelligence, Russia had in operation 450 diesels, most of which are capable of long-range operation. By contrast, the United States has some 100 conventional submarines with another 50 standing by in its moth-ball fleet.

If Russia should successfully undertake a nuclear-missile submarine program, how safe would our industrial defense centers be? The answer is that our shores would be roughly about as safe as Russia's. At a recent hearing of the House of Representatives Appropriations Committee in Washington — considering the financing of 100 nuclear-powered, missile-firing submarines—Chairman Cannon pointed out that 43 of our largest cities and 85 per cent of America's industry are situated less than 500 miles

from our coasts, standing as prime targets for submarine-borne enemy missiles.

Assuming the Congress approves an atomic submarine fleet, what is this country's industrial potential in filling the order? Currently, it appears better than the Russian potential on a basis of America's greater industrial diversification plus the knowledge gained in the building and test operation of our small but growing fleet.

When the U.S.S. Skipjack was launched May 26 at the Electric Boat Division yards of General Dynamics in Groton, Conn., it was the product of more than 500 American firms which had been brought together by the Atomic Energy Commission, the Navy Department and the Electric Boat Division of General Dynamics. Subcontractors were among our largest industrial concerns that provided important electronic instruments, as well as coffee urns, belt washers and thousands of other items required.

From Westinghouse came the atomic reactor; U. S. Steel provided new and special steels. From these large industrial producers, subcontractors range down to firms like Circle Steel, a 42-man Brooklyn shop which fabricated the crew's toilet lockers.

Initially the Atomic Energy Commission in cooperation with the Navy Department and industry constructed a land prototype nuclear propulsion plant of the U.S.S. Nautilus at Arco, Idaho, which was designed the STR Mark I. The Mark II version of this plant later was to be installed in the Nautilus.

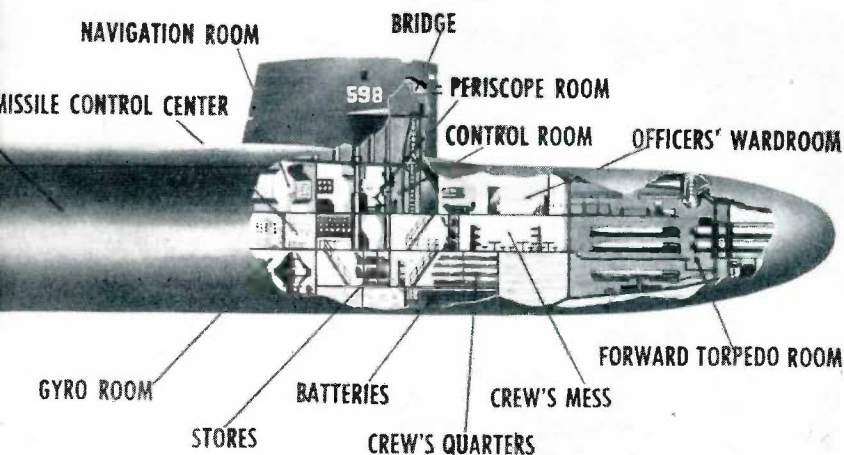
It has been 11 years since the Navy, with Congressional authorization, started its atomic submarine program under the direction of Admiral Hyman Rickover, then a captain. Today with three of these awesome defense weapons in operation, the results have been fantastically successful. "Our world leadership in this field, stands as a tribute to naval foresightedness and the ingenuity of more than 500 individual companies — and their thousands of subcontractors — brought together by Electric Boat to solve the knotty problems of nucleonics, electronics and metallurgy confronting them," according to Clifford F. Hood, President of U. S. Steel.

What have been the problems in developing this pipefitter's nightmare? How were the enigmas solved of engineering a vessel which was to have half of its hull crammed with power plant, machinery, wires and pipes? Then would there be space left for a crew of nearly 100 to man an heretofore unknown multiplicity of instruments?

First, there were few engineering precedents to guide its makers. Special steels were required to resist the critical temperatures and pressures of the atomic reactor and its adjacent boilers. Better armor plate was required, a step which fell to U. S. Steel's metallurgists. Working closely with the Navy, U. S. Steel technicians came up with a tough plate known as HY-80, a product of its Homestead (Pa.) Works, which last summer was written into Navy specifications. Samples of steel that go into underwater ships are painstakingly tested to assure proper performance under the severe usage to which they are submitted.

Samples are twisted, bent, pulled apart and X-rayed to determine dependability. In the case of hull plate, samples are put between bars of an oversized magnet and an oil and powdered iron mixture is washed over the plate's edge. If the plate is faulty or laminated, the iron particles cling to the cracks between the strata and the plate is rejected.

When it came to "wiring" our early atomic submarines, it was quickly ascertained that ordinary electrical conduits, many of which



pass near the reactor chamber, could not withstand nuclear heat. As a result, U. S. Steel's American Steel and Wire Division, among others, was able to provide through development and careful testing a highly resistant electrical cable which has been able to keep the submarine's electrical "nervous system" intact.

A wide range of special carbon, alloy and stainless forgings are required for the nuclear reactor which houses a "charge" of uranium, which, although smaller than a baseball, can propel the submarine more than 60,000 miles without refueling. Today, U. S. Steel is pouring heats of special steel to be cast and machined to unbelievable tol-

erances to meet these requirements. The intense heat of the coolants generated by the core (enough to provide for a city of 100,000 persons) could not be transferred by ordinary steel tubing to the vessel's turbines to drive twin propellers.

Moreover, metallurgists have been confronted with the problem that intense heat lowers resistance to corrosion, weakens metals, deforms parts under constant stress, and hastens metal fatigue.

"We not only are constantly improving the performance of the atomic submarine, but we are finding new and better ways of helping to adopt atomic power for peacetime application," according to Mr. Hood.

To help utilize every cubic inch of space, U. S. Steel's Christy Park Works has provided the Navy with another "first" in the form of curved stainless steel high pressure oxygen cylinders which follow the contour of the hull. It was another case of providing a special steel, engineering skill and fabricating know-how to help win the battle of space in our atomic submarines. The tough-skinned cylinders hold oxygen in highly-compressed form to meet the requirements of long-range submerged cruising.

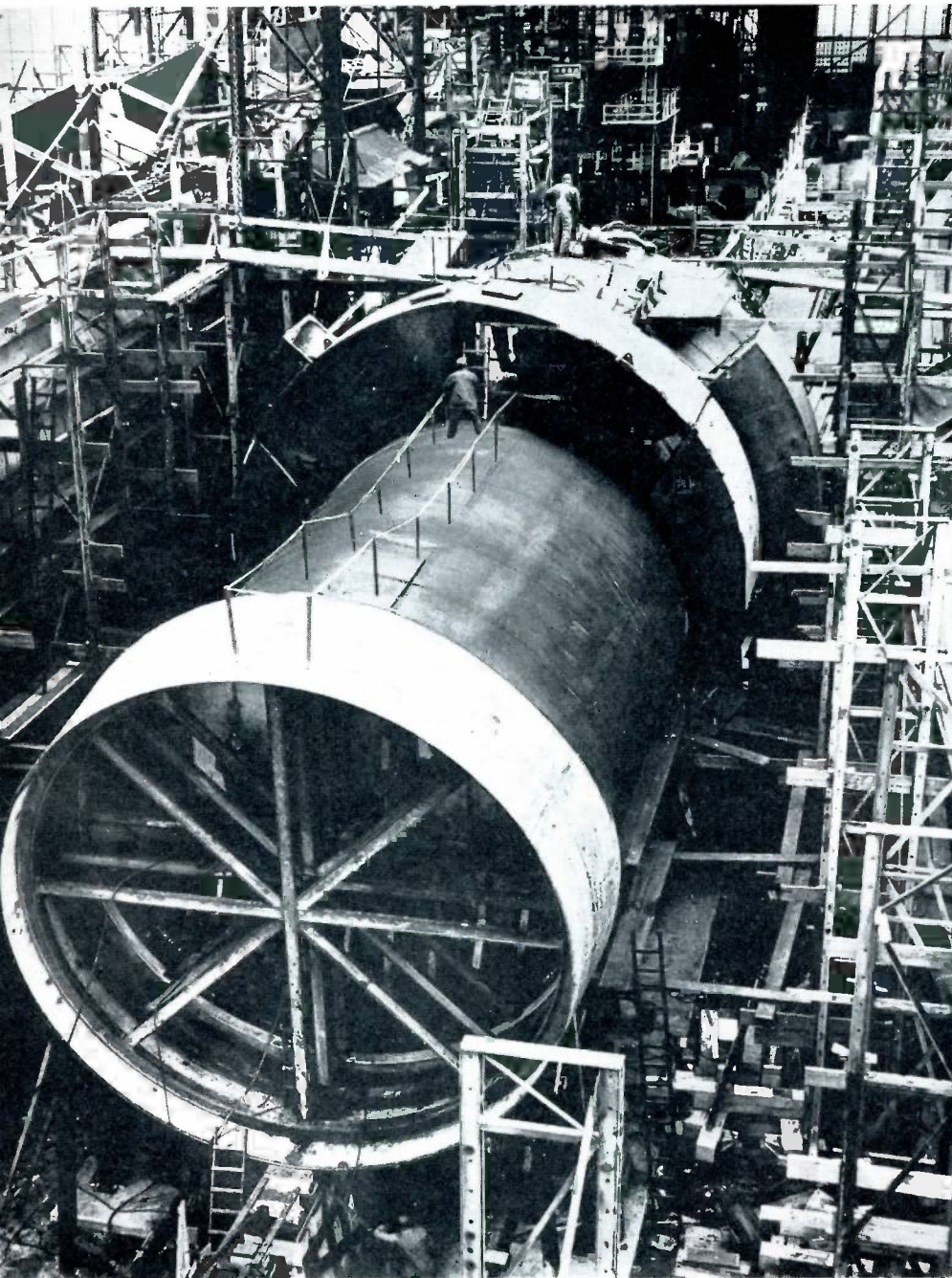
Specifications were painstakingly worked out to protect the crew against radioactivity. A pinhole leak in the water or "coolant" circulating system could be fatal. Despite the proximity of the crew to radioactive materials, the atomic submarine is so well shielded that a crew member is exposed to less radiation than the average civilian receives from everyday exposure to X-rays, cosmic rays and from the natural radioactivity in the sea through drinking water or from the ground, according to the Navy.

The submarine once was known as a "pigboat," or described more critically as "an oversized sewer pipe packed tight with hardware and manned by a crew of lunatics." She has come a long way since then.

The reason that neither side will ever win the battle of the sexes is that there is too much fraternizing with the enemy.

— :: —
No excuse is as good as a satisfactory performance.

An atom sub takes form at Groton, Conn. These underwater giants are approximately 300 feet long and take two years to build. (All photos courtesy United States Steel Corporation).



. . . . Around the Water Industry

Age Tests For Water

Tracing underground waters as they seep downward from the surface into water-bearing rock units is being accomplished through analysis of **tritium**, a radioactive isotope produced by thermonuclear explosions. Rain contaminated by tritium soaks into the ground and slowly makes its way to springs, rivers or wells. Analysis of the radioactivity of these waters can show the rate of ground-water flow, the quantity of natural replenishment, and the length of time since the water fell as rain.

Tests made by the New Mexico Institute of Mining and Technology on water seeping through the roof of Carlsbad Caverns showed an age of about three years. Tests of local deep wells and springs at Carrizozo and Silver City, N. Mex., showed that some of the ground water had been underground at least since 1954, when the first thermonuclear blast occurred.

Water Shortage Headed for Nevada?

Nevada faces a 1959 **drought**, unless spring rains are unusually heavy, according to predictions of state water officials. Flows in some streams may be as little as twelve percent of normal, and there is a possibility that power plants on several rivers will have difficulty in generating normal amounts of electricity next winter. Snow surveys have caused the Soil Conservation Service to predict an equally gloomy outlook for the Rio Grande and many other areas in the Southwest.

A New Way To Prospect

Traces of metals in water flowing in streams are now widely recognized as valuable clues to the location of hidden bodies of ore. By analyzing water samples as he moves upstream along tributaries, a prospector can track down the precise area in which minute quantities of metal originated.

This relatively-new branch of science, called **geochemical prospecting**, is being applied all over the world with considerable success. A truck-mounted apparatus devised by the U. S. Geological Survey can easily make 300 determinations daily, using a two-man crew.

Progress

Mechanical Equipment Co. of New Orleans says its new low-temperature evaporation unit may produce fresh water from salt water at a cost of only \$0.70 per one thousand gallons.

Russian Claims and Flood Protection

Russian weather-control methods cleared the skies over Moscow during a parade in 1952, according to the Soviet radio. Special "cloud-chasing" aircraft were given credit for the feat.

Federal flood protection should not be extended to areas with outmoded zoning ordinances, according to a TVA recommendation to Congress. Flood damage has been increasing for the past 50 years, despite huge federal outlays for flood control, because cities and towns continue to expand onto lands threatened by frequent floods. TVA recommends that zoning ordinances be based on flood studies, which the federal government would help to prepare.

(The information on this page was taken from **WATER NEWSLETTER**. For further information on any item, or to learn how you can receive the **NEWSLETTER**, write: Water Information Center, Inc., 60 East 42nd Street, New York 17, N.Y.)

STRICTLY *Off The Record*

When a man says, "It's not the money, it's the principle of the thing," it's the money

When a man is pushing 60, that's exercise enough.

Parking meter: snitching post.

Child guidance is what more people are getting from their children.

Some people are happy to have a means to live beyond.

For every student with a spark of genius, there are a dozen with ignition trouble.

The views expressed by the husband in the home are not necessarily those of the management.

Connoisseur: a person whose judgment agrees with yours.

Did you hear about the rich boy who has a hula hoop with white sidewalls?

A man pulling his own weight seldom has any left over to throw around.

"Be yourself" is the worst possible advice you can give to some people.

Younger Generation: A group that is similar in many disrespects.

Among things so simple a child can operate are parents.

A perfect wife is one willing to help her husband with the housework.

Buffet Dinner: When the hostess doesn't have enough chairs for everyone.

Someone has come up with a novel Christmas Club: you save up to pay for last year's gifts.

The modern idea of roughing it is driving with a standard shift.

Wolf: A man who believes in life, liberty and the happiness of pursuit.

Would it surprise you to learn that:

The world record for non-stop talking—133 hours—was set by Kevin Sheenhan of Limerick, Ireland in 1955?

About 75 percent of American school principals now have the authority to spank their pupils?

The average American spends 20 minutes per day on the telephone? (This figure does not include teenagers).

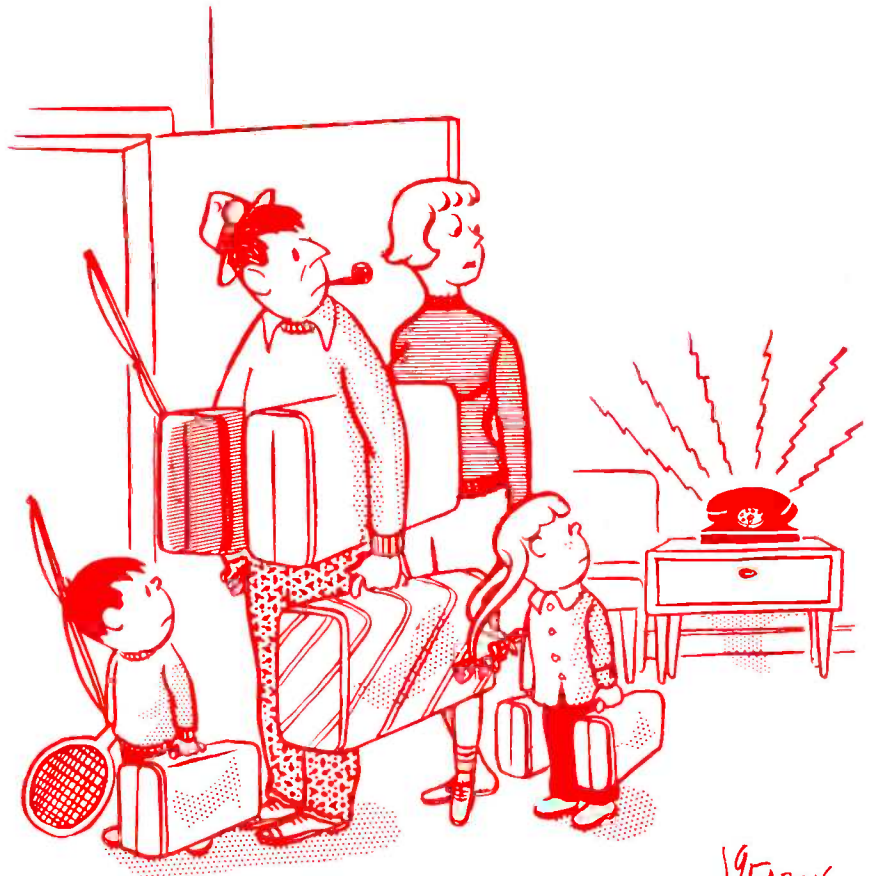
The Pacific Ocean is more than 35,000 feet deep in some places?

Llanfairpwllgwyngyllgogerychwyrndrobwlllantysiliogogoch is the name of a town in Wales?

One of the hardest secrets for a man to keep is his opinion of himself.

The president of a large corporation has instructed his personnel department to step up the hiring of personable young men. He says he's convinced it's the only way the company can attract secretaries.

Many a man is enough of a dope To be easily cleaned by the use of soft soap.



J. G. FARRIS

"Come July—Go West, Then Wester!" That's what the colorful literature from AWWA states. Reference is made, of course, to the 79th annual conference of the American Water Works Association, scheduled for San Francisco from July 12 to July 17.

The city is planning to roll out the red carpet, and conference plans are formalized and full of fact and fun.

Twenty-five official hotels and nine official motels have made rooms available to AWWA guests—including the famed and grand Sheraton-Palace, the Fairmont and Mark Hopkins hotels atop Nob Hill, and the beautiful Sea Captain Motel.

The very location of this year's conference is, in itself, a guarantee of a never-to-be-forgotten week in wonderland. It is a city of unsurpassable magnificence—with its steep hills, quaint architecture, multi-colored sunsets and, of course, all the magic that is Chinatown at night.

Certainly one of the prime attractions for visitors, whether it is the first trip or the fiftieth, is the fabulous "Top of the Mark," the world-famous cocktail lounge atop the Mark Hopkins Hotel. It is both unforgettable and thrilling to watch the watery reflections of the sunset give way to the early evening mists as they float like cotton over the city. And when the mists disappear, all of San Francisco—indeed, the countryside for miles around—glistens with a million tiny lights.

Fisherman's Wharf is a "must" for seafood dinners. Don't fail to drive across the Golden Gate. Visit Coit Tower and the import shops in Chinatown.

If you should be fortunate to find the time to sleep while in San Francisco, you'll find the climate conducive to that elusive habit. The days are warm and sunny; but, when the sun goes down, cool



An impressive part of San Francisco is the financial district, pictured above. The city is fast becoming a financial giant, and already ranks near the top among cities west of the Mississippi.

AWWA Convention

San Francisco—— City With Open Arms



Alcatraz Island, "The Rock," location of the Federal maximum security prison in San Francisco Bay, derives its name from the pelicans which roosted there in Spanish days. (All photos on these two pages courtesy San Francisco Chamber of Commerce).

breezes sweep the city, and a light blanket is a welcome addition.

It will be a wonderful week, and many of the AWWA visitors will extend their trip one week by visiting our newest state-to-be, Hawaii. Those taking the tour will leave San Francisco for Honolulu by Pan American Clipper on Saturday, July 18. Included on the trip is an all-day Circle Island Tour and a cruise to Pearl Harbor. Additional features will be attendance

at a Luau (Hawaiian feast) and a hula show at Kapiolana Park. The return flight by Pan American Clipper leaves on Saturday, July 25, for arrival in San Francisco on Sunday, July 26.

Every effort is certainly being made to assure you of a wonderful and exciting visit to the "City by the Golden Gate." For your convenience, the following pages are devoted to a complete convention business schedule.

At the right, San Francisco's most famous cable car ride, the Powell and Mason Line, ends just two blocks from Fisherman's Wharf. In the background is Russian Hill. Below, the fabulous Bay Bridge. Total estimated cost of the structure was \$77,200,000. The total length of the bridge from the San Francisco terminal to the Oakland terminal is eight and one-quarter miles.



MUELLER RECORD

The following convention schedule may be removed for your convenience



... Convention Schedule ...

MONDAY A.M., JULY 13 — SESSION 1

WATER WORKS DEVELOPMENT - MANAGEMENT

- 9:00 Motion Picture
9:30 Upgrading the Water Supply Industry..... L. S. Finch
10:00 The Business and Defense Services AdministrationH. B. McCoy
10:30 AWWA's Water Works Advancement Program.....James B. Corey
10:50 PROMOTING GOOD COMMUNITY RELATIONS
10:50 Good Utility Citizenship—What It Can Mean.....M. M. Jorgensen
11:10 Count Down to Oblivion..... Robert Gross
11:30 Representative of National Education Association
11:40 General Discussion

MONDAY A.M., JULY 13 — SESSION 2

PURIFICATION DIVISION

- 9:00 Motion Picture
9:30 Radioactivity of Surface Waters of the U. S.....L. R. Setter
9:50 Discussion (10 minutes each) . . .H. H. Gerstein, Harry P. Kramer, Harold E. Pearson, James C. Vaughn
10:30 General Discussion
10:40 Water Analysis by Neutron Activation.....Harry P. Kramer
(*Authors: R. L. Blanchard, G. W. Leddicotte and D. W. Moeller*)
11:00 Discussion
11:10 Stabilization of Magnesium Hydroxide by Up-Flow ClarifiersT. E. Larson
11:40 Discussion H. O. Hartung, J. L. Tuepker

MONDAY P.M., JULY 13 — SESSION 3

JOINT WATER RESOURCES AND MANAGEMENT DIVISIONS

- 1:30 Motion Picture
2:00 Development of the Upper Colorado River.....Ernest O. Larson
2:20 Discussion
2:30 The Philosophy of a Model Water Law.....Arthur M. Piper
2:50 Discussion
3:00 East Bay's New Aqueduct.....James W. Trahern
3:20 Discussion
3:30 Water Well Stimulation—A Survey of Current PracticesLouis Koenig
3:50 Discussion
4:00 Application of Hexadecanol to a Municipal Water Storage Reservoir..... Morrison B. Cunningham
4:20 Discussion

MONDAY P.M., JULY 13 — SESSION 4

JOINT DISTRIBUTION AND PURIFICATION DIVISIONS

- 1:30 Principles of Coagulation.....A. P. Black
1:50 Discussion
2:00 Conversion of Saline Water.....Everett D. Howe
2:30 DiscussionSheppard T. Powell
2:45 New Delhi Hepatitis Epidemic.....Joseph M. Dennis
3:15 Discussion Abel Wolman, Norman Clarke or Richard Woodward
4:00 PANEL DISCUSSION—Cross-Connection Control.....(Moderator) Andrew Dempster

TUESDAY A.M., JULY 14 — SESSION 5
GENERAL RESOURCES DIVISION

- 9:00 Motion Picture
- 9:30 Progress of the California Water Plan. M. J. Shelton
- 9:50 Discussion
- 10:00 Water—America's Number One Problem. Fred A. Seaton
- 10:45 Discussion
- 11:00 New Jersey's Forward Step in Water Supply. William J. Orchard
- 11:20 Discussion
- 11:30 San Francisco's Water Supply. James H. Turner
- 11:50 Discussion

TUESDAY A.M., JULY 14 — SESSION 6
PURIFICATION WORKSHOP

- 9:30 TASK GROUP REPORTS
 - Membrane Filters J. E. McKee
 - Filterability Index Joseph M. Sanchis
 - Diatomite Filters E. Robert Baumann
 - Radioactive Contamination Harold E. Pearson
 - Synthetic Detergents Paul D. Haney
 - Filter Backwashing J. E. McKee
 - Biological Infestation Marshall P. Crabill
- 10:45 RESEARCH REPORTS
 - Water Treatment Effect on Main Capacity T. E. Larson
 - Protective Coatings for Mains. Robert F. McCauley
 - Chromium/Cadmium Tolerance R. U. Byerrum
 - Coagulation A. P. Black
 - Manganese Problems A. E. Griffin
 - Chlorine Impurities Thomas DeVries
- 11:45 Election of Officers

TUESDAY P.M., JULY 14 — SESSION 7
PURIFICATION DIVISION

- 1:30 Motion Picture
- 2:00 Design Criteria for Rapid Sand Filters. (Moderator) John M. Jester
- 3:00 Short Filter Run Study—Lake Michigan. Merrill B. Gamet, John M. Rademacher
- 3:30 Discussion
- 3:45 PANEL DISCUSSION—Recalcing Water-Softening Sludges. (Moderator) William B. Crow
- 4:30 Discussion

TUESDAY P.M., JULY 14 — SESSION 8
GENERAL — MANAGEMENT DIVISION

- 1:30 Motion Picture
- 2:00 Consolidating Water Systems in California. John C. Luthin
- 2:20 Discussion
- 2:30 The Puerto Rico Aqueduct and Sewer Authority Rafael Urrutia
- 2:50 Discussion
- 3:00 Regional Water Supply Systems—Developed by the Central City. . . W. W. DeBerard or James W. Jardine
- 3:30 Regional Water Supply Systems—Developed by District Authority John W. McFarland
- 4:00 Discussion
- 4:15 Long-Range Weather Forecasting as a Water Supply Tool. Irving P. Krick

WEDNESDAY A.M., JULY 15 — SESSION 9
RESOURCES WORKSHOP

- 9:00 Motion Picture
- 9:30 Weather ControlF. W. Decker
- 9:50 DiscussionR. S. Millar
- 10:00 Underground Waste Disposal..... Lynn Miller
- 10:20 Discussion
- 10:30 Ground Water Recharge.....John J. Baffa
- Erosion Control
- Salinity Reduction
- 11:30 Election of Officers

WEDNESDAY A.M., JULY 15 — SESSION 10
WATER WORKS ADMINISTRATION — OPEN SESSION

- 9:30 Motion Picture
- 10:00 Report of General Chairman
- 10:15 TASK GROUP REPORT—Rating Water SystemsJohn Murdoch
- 10:30 Discussion
- 10:40 TASK GROUP REPORT—Job Classifications Robert S. Millar
- 10:50 Discussion
- 11:10 Domestic Water UseH. E. Hudson, Jr.
- 11:30 Discussion
- 11:45 Pension and Retirement Systems..... John Copley

WEDNESDAY P.M., JULY 15 — SESSION 11
JOINT MANAGEMENT AND DISTRIBUTION DIVISIONS

- 2:30 Motion Picture
- 3:00 Mechanics of Bond Election Campaigns.....F. H. Eastman
- 3:30 Maintaining Public Support of Water Works ImprovementsMilton Rosen
- 3:50 DiscussionRobert S. Millar (and others)
- 4:15 Highway Regulations Relating to Utility Facilities(Moderator) Bruce Baty

WEDNESDAY P.M., JULY 15 — SESSION 12
WATER WORKS PRACTICE — OPEN SESSION

- Certification of Water Works Materials.....L. S. Finch, H. E. Jordan
- Research on Water Meter Casings.....H. F. Barrett
- AWWA's Interest in International StandardsS. Logan Kerr
- REPORTS: Cast Iron Pipe Committee.....Raymond J. Faust
- Spillway CommitteeRaymond J. Faust
- DISCUSSIONS:
 - Plastic Pipe Use and Experience Therewith
 - Epoxy Resins as Protective Coatings
 - Standards Designs and Diagrams for Blocking of Pipe Bends, Plugs and Fittings

THURSDAY A.M., JULY 16 — SESSION 13
MANAGEMENT DIVISION

- 9:00 Motion Picture
- 9:30 Blue Sky Thinking—The Water Works of the Future
 - 9:30Victor A. Appleyard
 - 9:45William R. Seeger
- 10:00 Discussion
- 10:15 How Much Does Your Accident Price Tag Show?..... George Sopp
- 10:40 Discussion
- 10:50 Changes in State Laws Concerning Public LiabilityGerald Remus
- 11:20 Discussion
- 11:30 25 Years of Parallel Private and Public Utility OperationPeter C. Karalekas
- 12:00 Discussion
- 12:15 Adjourn

THURSDAY A.M., JULY 16 — SESSION 14

DISTRIBUTION DIVISION AND WORKSHOP

- 9:00 Motion Picture
9:30 The Role of the Corrosion Engineer in the Water SystemPaul Beerman
9:50 Discussion
10:00 Distribution of Soil Conductivity and Its Relation to CorrosionGordon N. Scott
10:20 Discussion
10:30 Ground Storage vs. Elevated Storage Marsden C. Smith
10:50 Discussion
11:00 The Effect of Valve Operation on Water Hammer S. Logan Kerr
11:20 Discussion N. B. McPherson
11:30 to 12:00 Distribution Workshop — Election of Officers — Remarks by the Chairman

THURSDAY P.M., JULY 16 — SESSION 15

MANAGEMENT WORKSHOP

- 2:00 Budgeting and Cost Accounting Systems at WorkJ. P. Dieter, C. E. Hemphill
2:45 Compensation of Water Works Managers Garvin Dyer
Discussion Raymond J. Faust
3:15 PANEL DISCUSSION—The Need for Demand Meters (Moderator) George H. Dann
3:45 Meter Manufacturer's Viewpoint W. P. Hersey, M. E. Hartz, J. P. O'Grady
4:30 Election of Officers

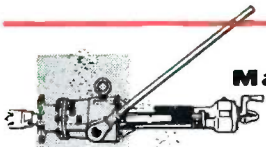


MR. LAUREN W. GRAYSON

President-Elect

American Water Works Association

MUELLER® PRODUCTS STANDARD OF THE WATER WORKS INDUSTRY



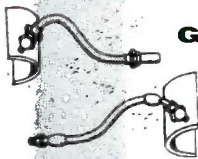
Drilling Machines

...cuts from ½" to 12".
Pressures to 500 p.s.i.



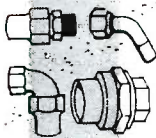
Corporation Stops

...½" to 2". Practically
any combination of
inlets and outlets.



Goosenecks

...wiped joint, lead
flange, solder joint.



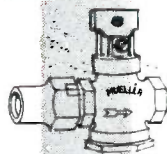
Service Pipe and Fittings

...tees, branches,
couplings, fittings.



Service Clamps

...single or double strap.



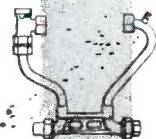
Curb Stops

...inverted key or solid
head. ½" through 2".



Curb Boxes

...telescopic type.

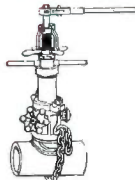
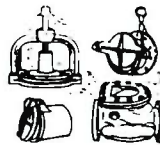


Meter Setting Equipment

...yokes, relocators, stops,
meter box covers.

Since the first Mueller Tapping Machine revolutionized the method of making service connections to mains, Mueller products have been the water industry's basic equipment. Today, a large portion of the nation's water works companies use Mueller products — many exclusively. Their trust in the superior quality of Mueller products is repaid with long, trouble-free service.

**Miscellaneous
Valves**...check, flap,
mud valves...shear gates...
valve operating mechanisms
...indicator posts, floor
stands, extension stems.

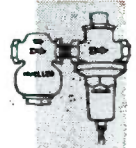


Tapping Machines

...for inserting corpora-
tion stops ½" through 2"
...plugs ½" through 4".

Regulators, Strainers, Relief Valves

...for water, steam,
gas or oil.



Tools

...jointers, calking tools.



Fire Hydrants

...AWWA improved.
Flush type.



Gate Valves

...2" to 48". Four-point
wedging mechanism.



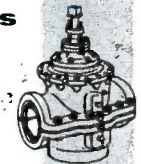
Tapping Sleeves, Crosses, Valves, Repair Sleeves

...to 48". Calked or
mechanical joint types.



Inserting Valves - Equipment

...for 4", 6", 8" lines.
Pressures to 125 p.s.i.



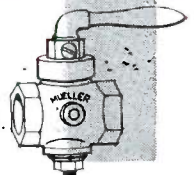
Valve Boxes

...for valves to 24"



Rough Plumbing

...stops, drains, faucets.



**MUELLER CO.
DECATUR, ILL.**



Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario

Public Relations At Work

Water Department public relations in Wichita, Kansas, took another step forward recently, when the Wichita Water Department began exhibiting a model of a typical Wichita water service. According to Mr. R. W. Johnston, Operations Chief Engineer, the model, which was made with Mueller products, has been used in the department's office to explain to new customers exactly what constitutes a water service.

In addition, the model was displayed in a Water Department booth during an exhibit of materials used in new home construction. In this instance, the model was used to demonstrate the typical water service connection.

The exhibit is rather inexpensive to make, and can usually be constructed from Mueller products already on hand. Another effective use for such a model would be as a display in your community schools, since many schools study water sources and means of distribution as a part of conservation courses.



The model of a typical water service connection was displayed in late February and early March by the Wichita Water Dept. at a home show.



The model is also used in the department's office for educational purposes.

THE East Bay Municipal Utility District was created by vote of the people in 1923 to overcome the water supply shortage which then faced the communities on the east side of San Francisco Bay. The water shortage was solved by going to the Sierra country for pure snow water and transporting it to the East Bay through an aqueduct system. The original Utility District service area of 93 square miles has since grown to a 230-square-mile area covering much of two counties.

Because they knew what it was like to be without enough water, the leaders of that day had seen the wisdom of planning ahead to anticipate future needs so that there would never be another water shortage. That is why the people of the Utility District have never felt a lack of water since the first Mokelumne supply reached East Bay faucets, in sharp contrast to many other areas of our country during recent years.

The consumption of water within the Utility District, however, continues to climb sharply each year, and the need for water today is nearly five times as great as in 1923, when planning for the Mokelumne system was begun. Things are rapidly reaching the point where water demand will exceed the Utility District's present supply capacity. At the present rate of increase, by 1967, consumers will take every gallon of water the Utility District is able to deliver with present facilities. In the immediate future, therefore, Utility District expansion must include major additions to the basic supply system, as well as continued expansion of distribution facilities.

For the past 10 years, the Utility District has been working on plans to prevent a future water shortage by expanding the entire EBMUD water system. The result of these years of effort is the Water Development Project for the East Bay Area.

Everything starts with people, and it is because of people that the

California Utility Prepares for the Future

**Nine Years To Plan;
Ten Years To Construct**

East Bay Municipal Utility District's Pardee Dam and Reservoir, showing spillway to right of dam. Capacity is 68 billion gallons. Two new reservoirs, one above and one below, will increase capacity to 144 billion gallons.



Utility District must expand. You are well acquainted with the population growth of the State of California. The East Bay is prominent in that growth. In 1940, the population served by EBMUD was 519,000. Today it is more than double that amount—1,040,000. District forecasts for 1967 place the population at 1,300,000. The ultimate population projected for the EBMUD service area is 2,600,000.

A reliable index of a community's growth is increasing water consumption. A growing demand for more water invariably means there are more thirsty mouths, more homes, more industry, and, incidentally, a higher standard of living. Garbage disposals, automatic washers and dishwashers all take water that wasn't needed in past years. The amount of water served each day by EBMUD has grown tremendously, from 42 million gallons daily in 1940 to 130

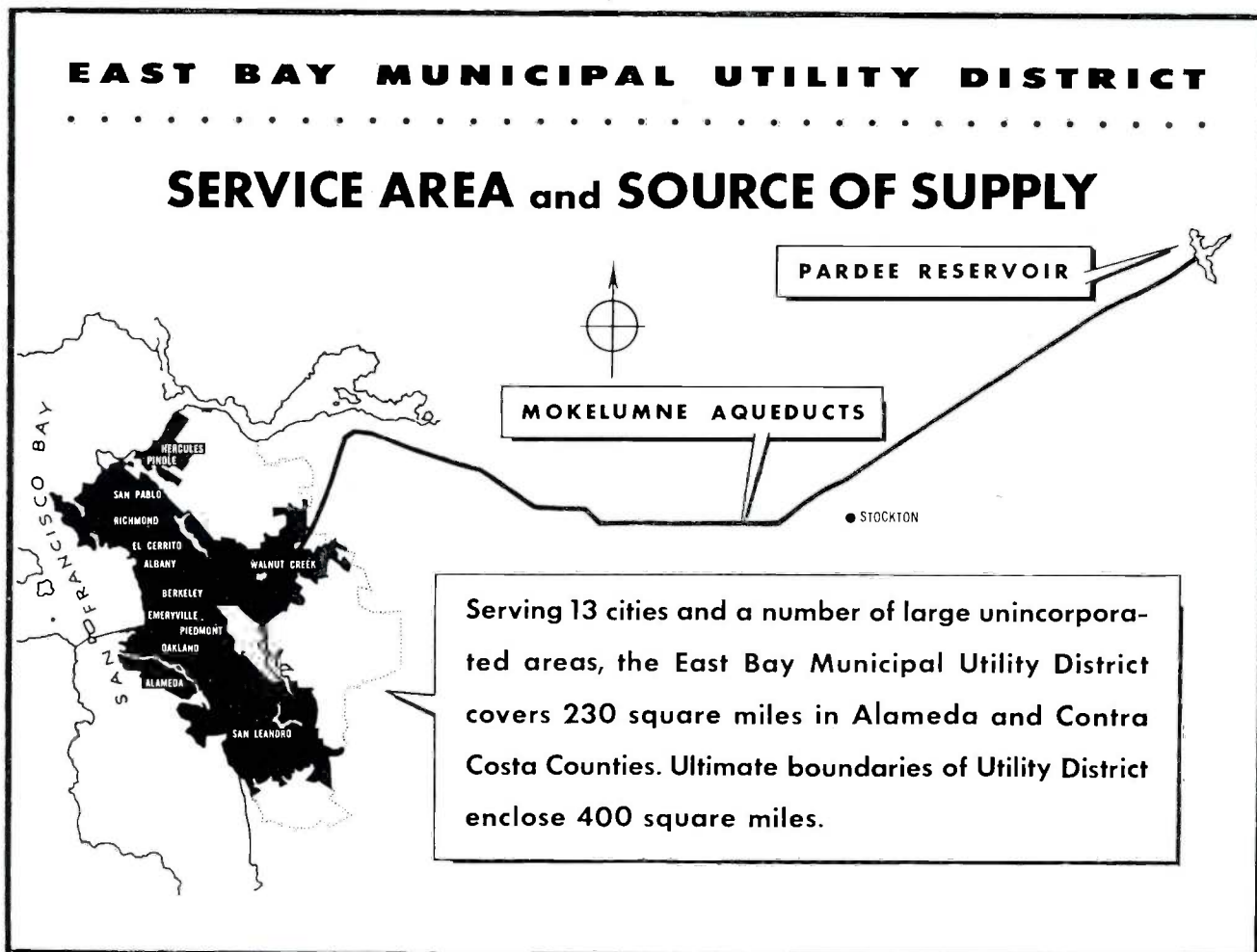
million gallons each day in 1957. And it is still growing. The consumption forecast for 1967—200 million gallons daily—will equal the amount of water EBMUD can serve each day with its present water storage and its present facilities. The ultimate forecast is for 350 million gallons daily.

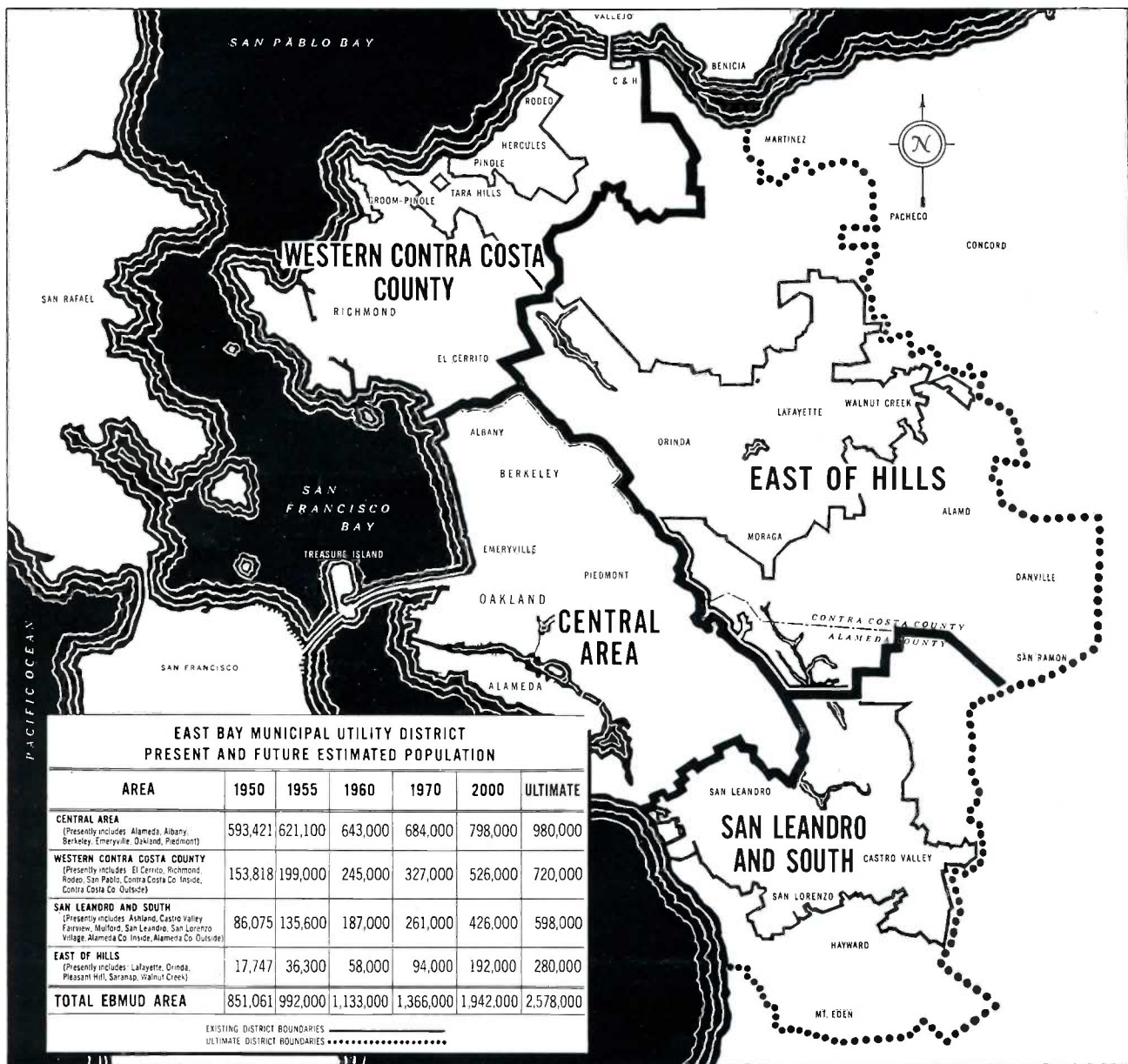
Since the Utility District's previous forecasts of both population and water consumption have proved to be remarkably accurate, we can realistically assume that unless something is done to provide more water, there will not be enough to go around after the year 1967. The Utility District engineering staff recently completed plans for a giant construction program to provide the needed water.

The foundation upon which the EBMUD water system has been built is the Mokelumne River, formed by the melting snows of the Sierra Nevada. The original

water right permit for 200 million gallons daily was augmented in July 1956 by a new permit from the State of California for an additional 125 million gallons daily. Water source development will include facilities to impound this additional flow now available to EBMUD. At the present time, the Mokelumne River storage capacity is 68 billion gallons. This is the amount of water which can be impounded by Pardee Dam. The Water Development Project for the East Bay Area will increase Mokelumne storage to 144 billion gallons of water for their use. This will be accomplished by construction of two new reservoirs, Middle Bar and Camanche. Middle Bar Dam and Power House will be built above the existing Pardee Reservoir; Camanche is to be located downstream from Pardee Dam.

The first Mokelumne Aqueduct,





linking Pardee Reservoir with the East Bay, was completed, along with Pardee Dam, in 1929. A second aqueduct, which more than doubled the original aqueduct capacity, was placed in service in 1949. The present combined capacity of these twin aqueducts is 175 million gallons daily. The third aqueduct to transport water from the existing and proposed Sierra reservoirs to the East Bay will be constructed on the same right-of-way as the existing aqueducts. Together with the two present aqueducts, it is designed to be capable of transporting all of the available

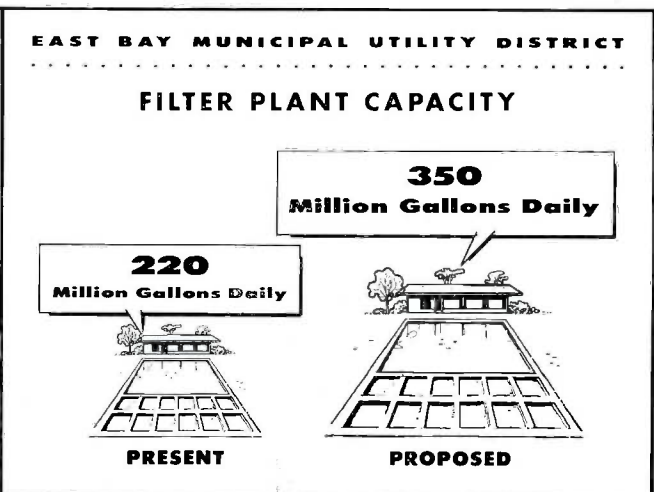
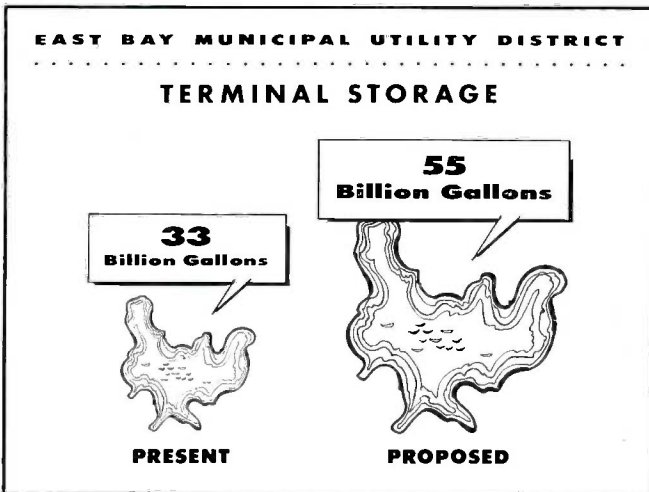
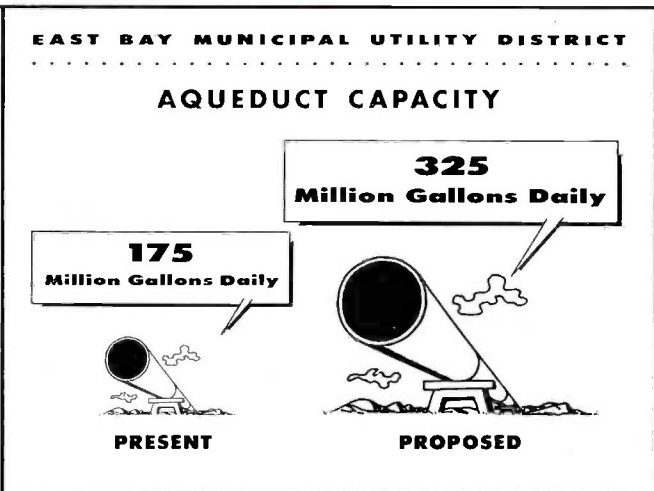
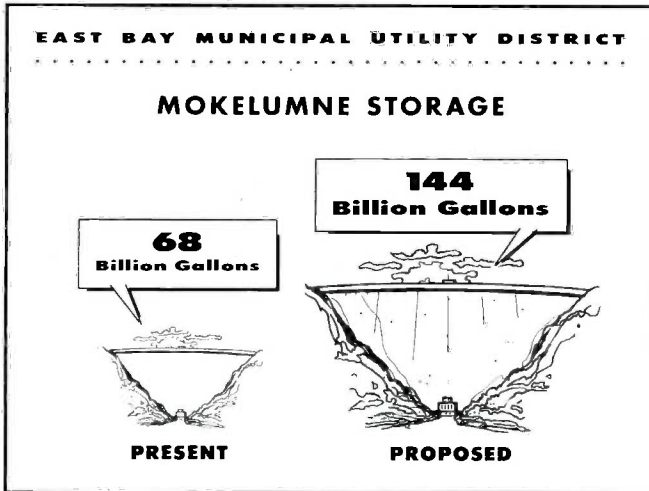
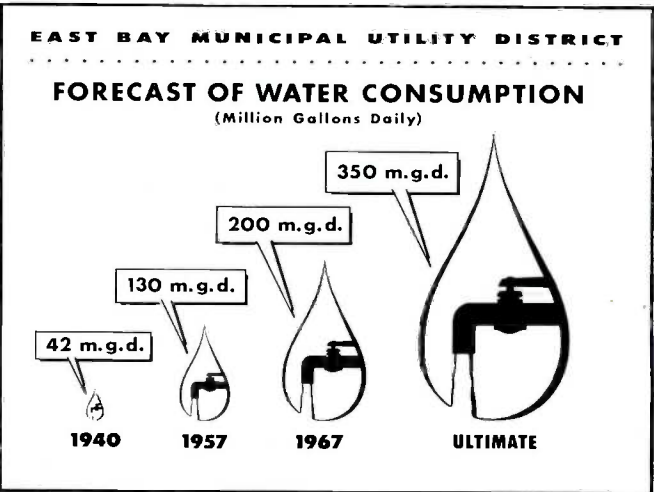
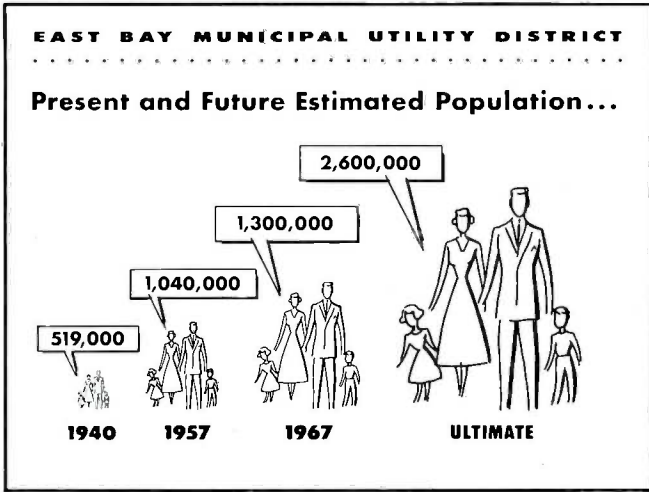
Mokelumne River water supply, 325 million gallons daily.

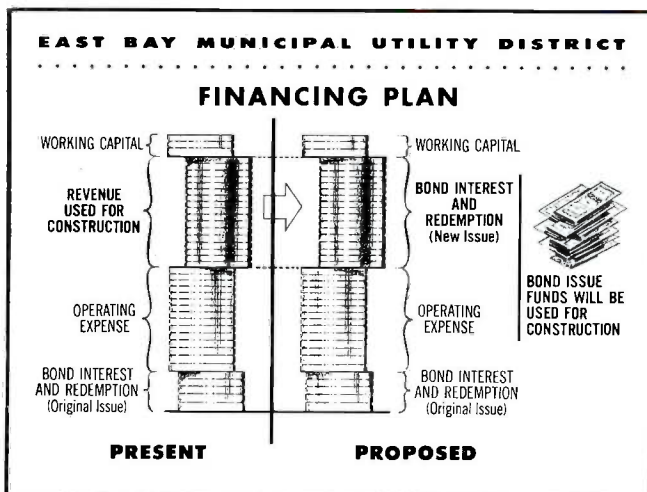
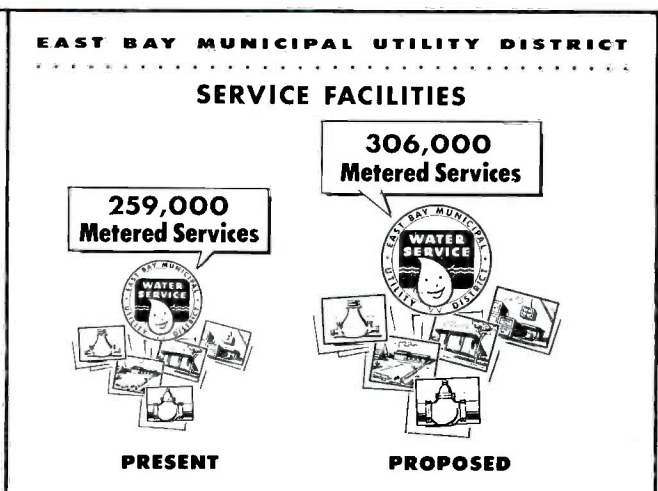
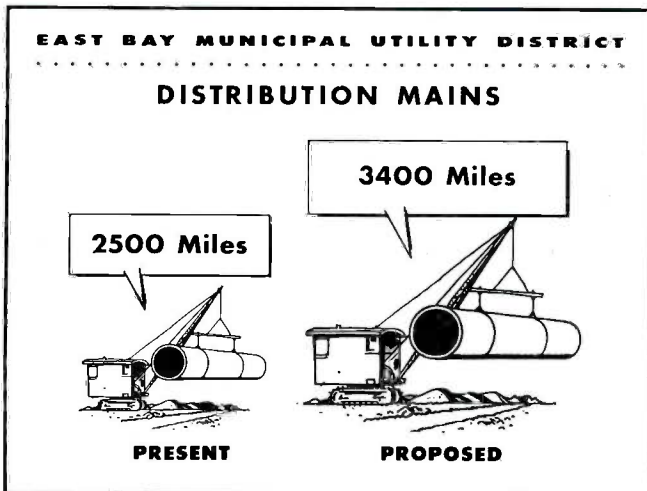
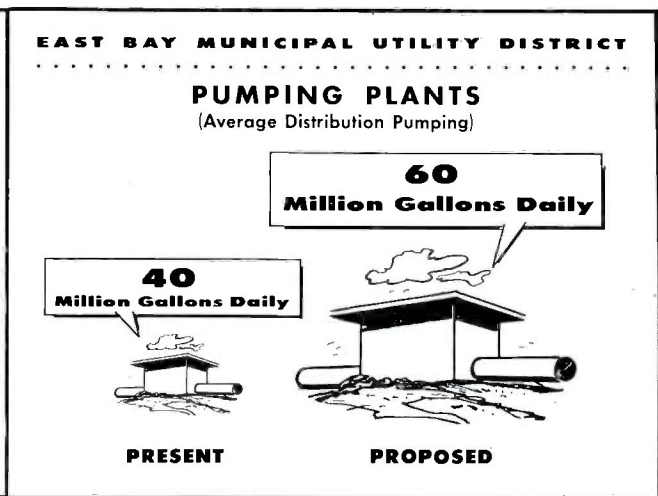
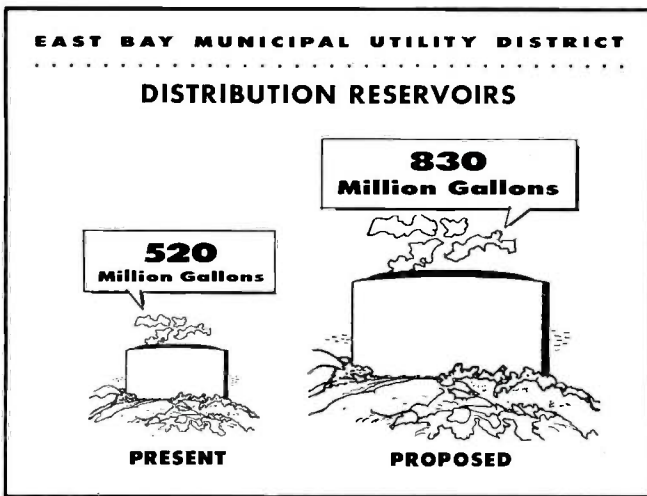
The steel pipeline will be 87 inches in diameter (Aqueduct No. 1 is 65 inches; Aqueduct No. 2 is 67 inches). The new aqueduct will stretch more than 80 miles in length (not including 14 miles of connecting tunnels).

Because a third aqueduct is needed for full utilization of the present Mokelumne storage, and will be needed almost immediately, this will be the first feature of the Water Development Project.

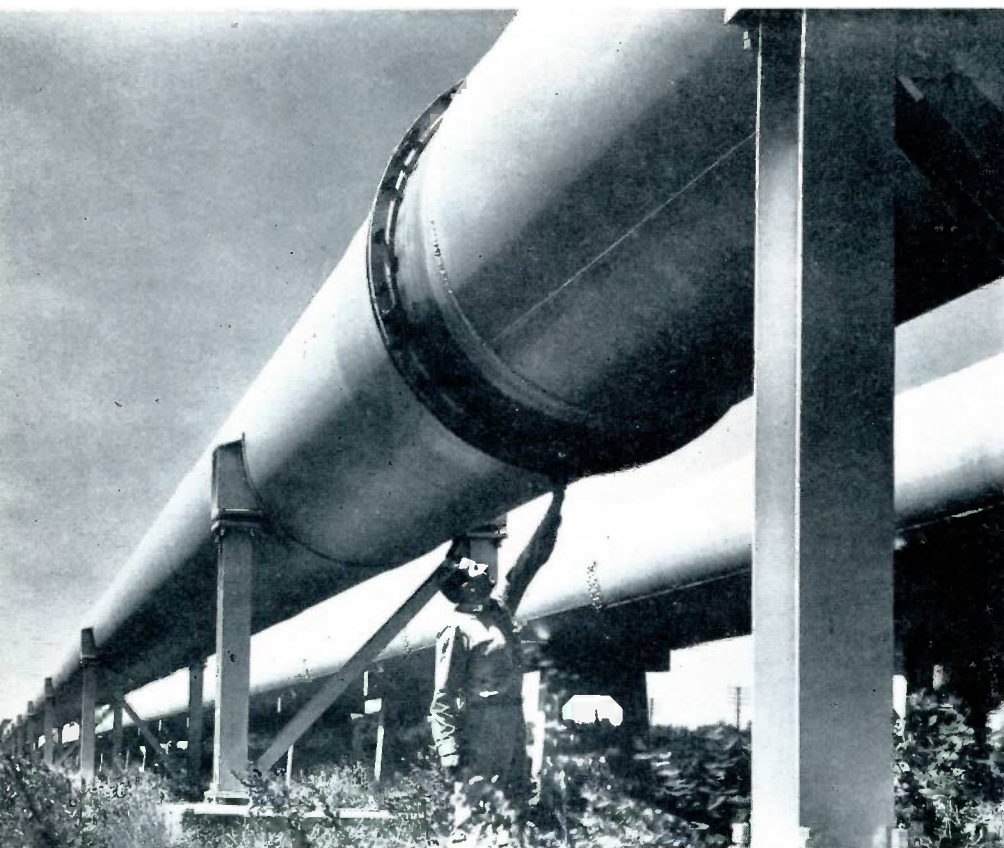
The Utility District has four local terminal reservoirs—San Pablo,

Upper San Leandro, Chabot, and Lafayette. These terminal reservoirs store water from the Mokelumne Aqueducts, as well as local rainfall runoff. Their function is to enable the District to maintain a **90-day safe reserve supply** of water within the service area. They store water throughout the months of light consumption for **peak consumption** in the summer months. They also store water from a **wet year to a dry year**. The present total terminal storage is 33 billion gallons. Briones Reservoir, an additional terminal reservoir, is planned. (Continued on page 22)





- EAST BAY MUNICIPAL UTILITY DISTRICT**
- 9 Years In Planning
 - 10 Years to Construct
 - Required Bond Financing \$252,000,000
 - Bond Issue Election June 3
 - No Increase in Tax Rate
 - No Increase in Water Rates



Twin aqueducts, averaging 67 inches in diameter, transport water for more than 90 miles across California's Central Valley from Pardee Reservoir to the District's 240 square mile service area in the East Bay.

(Continued from page 19)

ned for immediate construction in the East Bay to augment the four existing reservoirs, increasing storage capacity to 55 billion gallons.

Every drop of water served by the East Bay Municipal Utility District is pure, filtered water. The EBMUD is the only large water system west of Chicago to provide a 100 percent filtered water supply. Consumers receive the highest quality water, and the Utility District is pledged to maintaining this high standard of quality. To accomplish this, its present filter plant capacity—220 million gallons daily—must be increased to 350 million gallons daily. This increase in filter plant capacity of more than 60 percent will be gained by the construction of two new plants, and the enlargement of two of the five existing plants. New plants will be located at El Sobrante and Walnut Creek. Upper San Leandro Filter Plant will be nearly tripled

in capacity. Lafayette Filter Plant capacity will be doubled. Capacity of Orinda, San Pablo, and Chabot Filter Plants will remain unchanged.

From the filter plants, water goes into the distribution system for delivery to EBMUD consumers throughout the service area. In each of the many distribution zones which are made necessary by changing terrain and elevations, there are one or more distribution reservoirs. These distribution reservoirs store some of the filtered water from the filter plants before it reaches the consumer. One purpose of distribution storage is to provide from two to three days' emergency supply, based upon the maximum requirements for that particular zone. The distribution reservoirs also help the water system meet peak demands during the day and to stabilize the supply of water available for use in each zone. A third important function of the distribution reservoir is to

provide a reserve water supply for fire protection. The present distribution reservoir capacity of 520 million gallons will be increased to 830 million gallons by the construction of 81 new distribution reservoirs and tanks.

Necessary to the distribution of water in the EBMUD service area are the many pumping plants which periodically operate to pump water from transmission lines to higher elevations where the water is needed. Their companion regulators regulate the pressure of water traveling from higher to lower elevations during emergency or peak flows. Expansion of the Utility District distribution system naturally will include additional pumping plants and regulators. The proposed additions will increase distribution pumping from 40 million gallons daily to 60 million.

The Water Development Project for East Bay Area calls for 900 miles of new pipeline installation. This increases the present 2,500 of distribution system pipe in the ground to an equivalent of 3,400 miles.

At the present time, there are 265,000 metered services in the EBMUD service area. The number of services will increase to 306,000 in the next decade, requiring a comparable increase in service facilities, such as connecting lines, meters, service yards, and service buildings.

This, in brief, is the construction involved in the Water Development Project for the East Bay Area. The project was arrived at after years of intensive study, planning, designing, and cost estimating by the Utility District engineering staff. Since then the EBMUD plans have been reviewed by the Bechtel Corporation in a study of both the engineering and economic feasibility of the water development project. The Bechtel firm enjoys a world-wide reputation in the engineering field, and previous to the EBMUD study it completed a review of the giant Feather River water development project for the State of California. The Bechtel consultants, after a four-month review of the East Bay Project, have concurred in the main with the

Utility District plans, projected water needs and construction requirements, and cost figures.

Just what are these cost figures for the facilities which will answer the need for more water? The carefully checked estimates for the expansion of both supply and distribution systems of the EBMUD include these items: Dams, \$42,338,000; Aqueduct, \$68,233,000; Terminal Reservoirs, \$38,906,000; Filter Plants, \$14,105,000; Distribution Reservoirs, \$26,781,000; Pumping Plants, \$4,279,000; Distribution Mains, \$65,653,000; Service Facilities, \$22,713,000.

The total cost of this construction is \$283,000,000. Of this amount, the Utility District expects to finance from revenue \$31,008,000 of the total cost. The balance, to be financed by the bond issue, approved overwhelmingly by the district voters last June (1958), totals \$252,000,000. The most important fact of the financing plan is that **no increase in the EBMUD tax rate or water service rate is required** because of the new bond issue. The net revenues heretofore used for new construction will be used instead to redeem the debt.

How does the Utility District propose to pay for its operating costs, redeem the bonds still outstanding, pay for bond interest and redemption on the new issue, and still have a reserve fund for working capital? At the present time, a portion of total revenue is applied to bond interest and redemption of the original issue. A larger portion is applied to operating expenses. A similar portion of revenue is used for construction. The remaining portion is held as working capital. Under the proposed financing plan for the Water Development Project, the portion of total revenue applied to bond interest and redemption of the original issue will continue to be applied as at present. The portion used for construction at the present time will be applied instead to bond interest and redemption of the new bond issue, and the new bond issue funds will be used for construction. A portion of total revenue will be held for working capital as at present. The

amount spent for bond redemption of the present issue will decline each year into the future. The amount devoted to bond redemption and interest on the new bonds increases sharply during the 10-year period, then levels off into the future. Operating expenses continue their present trend of gradually increasing each year in proportion to the increase in the amount of water served.

At the present time, approximately \$8 million annually has been available for investment in new construction. As the cost of bond redemption and interest on the new bonds increases, the amount of working capital decreases, reaching its low point in 1967. From that year forward the amount of working capital begins to increase rapidly as the cost of bond redemption and interest on the new bonds levels off.

In Summary

This story, then, is only the beginning, rather than the end, of a dream which will make consumers in the East Bay Area self-sufficient in terms of water supply and distribution. It is a dream which, to many, seems fantastic in terms of present-day costs. Yet, many minds have combined to mold this dream into a concrete, workable plan which will assure the people of the East Bay an abundant water supply for generations to come. Total estimated construction costs will exceed \$283,000,000, and the glowing part of this expansion is that no increase in the tax rate or water service rate is required.

The people in the East Bay Area are indeed fortunate, and the Water Development Project of East Bay Municipal District will stand as an example of the ultimate in success in long range planning.

The Upper San Leandro Filter Plant (one of five in the system), showing aeration basin in center of photo; directly in back is the chemical storage tower; to the right are the coagulation and sedimentation basins. A contract totaling approximately \$3 million was awarded last December to enlarge this plant to 84 million gallons daily.



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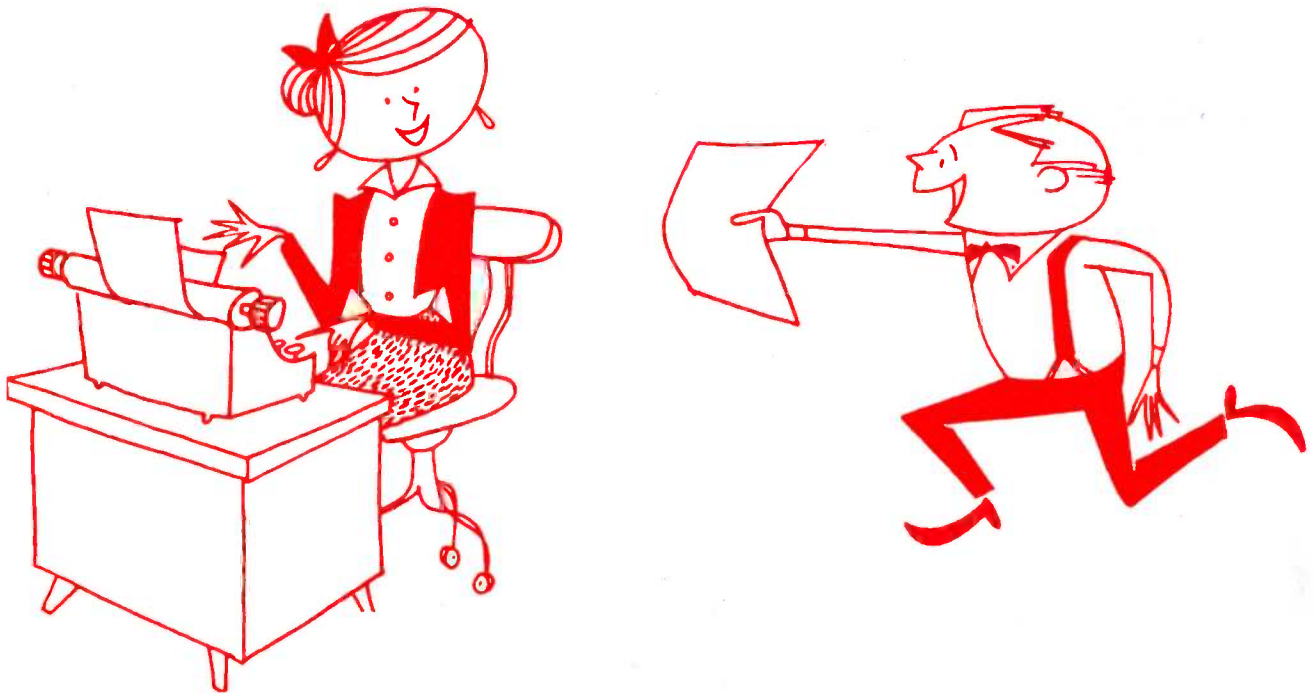
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