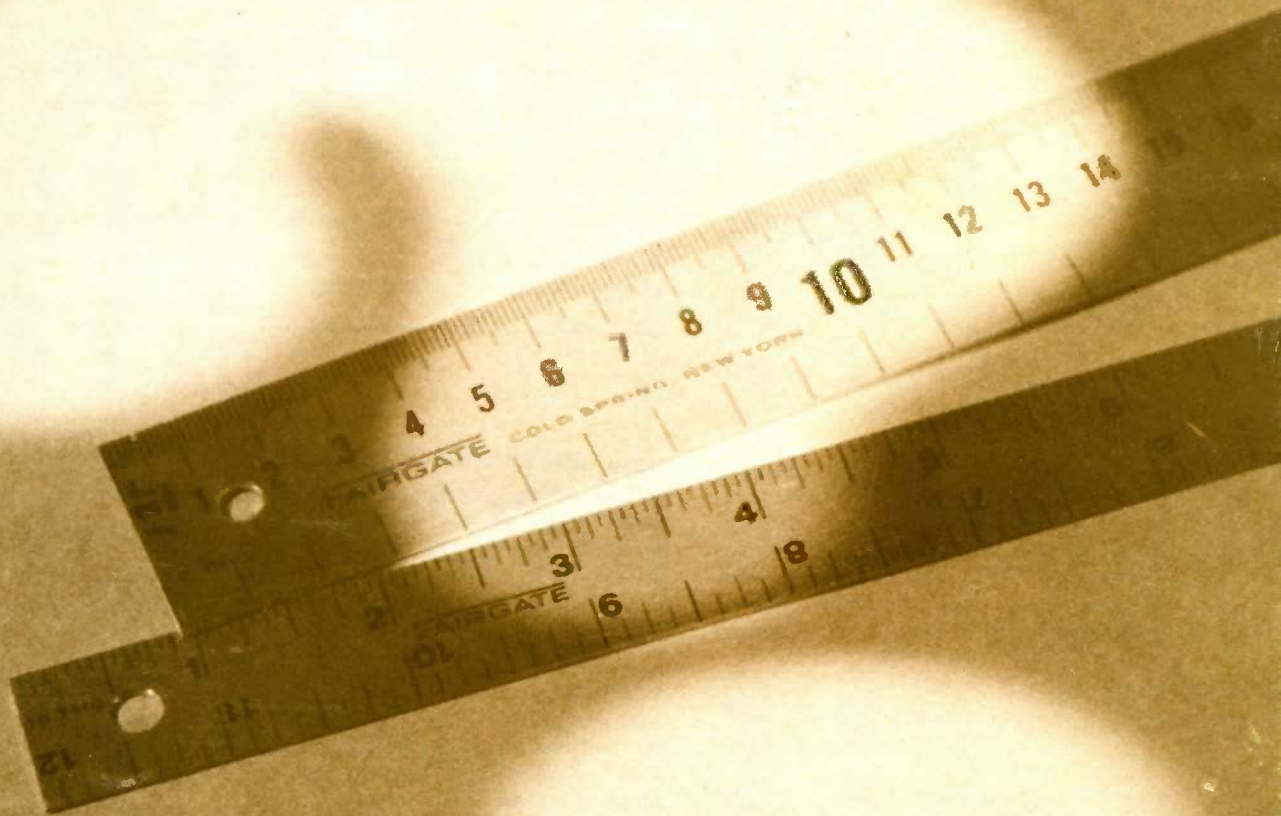


MUELLER® Record

FALL, 1977



**Metric conversion
poses challenge
to water industry**

Contents

CHALLENGES FACE WATER INDUSTRY AS U.S. FOLLOWS THE LITRE Mueller Co.'s Carl Floren discusses the issues	page 3
<hr/>	
MUELLER NEWS Board elections	11
<hr/>	
THE GIRL WITH THE MILLION DOLLAR VOICE Mystery woman identified	11
<hr/>	
POWER OPERATOR EMPTIES SHOP H-603 takes "center stage" outside maker's firm	11
<hr/>	
U.S. WATER CRISIS: Second of a two part series	14
<hr/>	
HYDRANT HIGHLIGHTS Fire hydrants in the limelight	18
<hr/>	
INDUSTRY NEWS Items of interest to the Water Distribution Industry	18
<hr/>	
A PAGE FROM THE PAST New use for an old-time call box	19
<hr/>	
OFF THE RECORD A few rib-ticklers you might enjoy	19

MUELLER[®]
Record

FALL 1977

Published by
Mueller Co.
500 West Eldorado St.
Decatur, Illinois 62525

Jim Cussins
Editorial Consultant



About the cover

Design in metrics: to change or not to change. The decisions could have far-reaching effects.

CHALLENGES FACE WATER INDUSTRY AS U.S. FOLLOWS THE LITRE AND BEGINS

CONVERSION TO THE METRIC SYSTEM

Have you any idea how much effort will be required for Mueller Co. to convert all its engineering drawings and records to the metric system? Six hundred man-years. That's the equivalent of 600 men working one year, 60 men working 10 years, or one man working 600 years on the project.

And that's making just the so-called "soft" conversion. The "hard" conversion would require even more effort and money.

But Mueller's problems will be just a drop in the bucket compared with those the water distribution industry faces. That's the warning issued by Carl E. Floren, Mueller Co.'s technical director, in a speech delivered earlier this year in Portland, Maine. His audience was members of the Maine Water Utilities Association and the New England Water Works Association attending a joint trade show.

While converting to the metric system would appear to put the United States

in step with the rest of the world, there are many problems yet to be resolved within the metric system itself. Industries in the U.S. and in other countries, where conversion is underway, are encountering these problems and other challenges.

In his speech on a vital but too often casually considered subject, Mr. Floren relates some of man's historic attempts to establish satisfactory weights and measures. And he asks for proper planning and safeguards within the water distribution industry as the U.S. prepares to join other nations in what apparently will become the world's one system of measurement — the metric system.

Following are excerpts from his speech entitled "Metrics. Is the U.S. playing follow the litre?"

If you are like me, you have been thinking "What now?" We have a Metric Transition Act. It is voluntary. It has no timetable. But it does put the will

of Congress and the President on the side of an eventual change. In our reading we can see this changeover taking place. At times I get into a cold sweat just thinking about it. So what is this Metric System, which more properly stated is the System International (S.I.)?

Man's had problems with measures

History records man's troubles with his weights. Moses, writing God's words in Leviticus (19:35,36) says, "Ye shall have no unrighteousness in judgment, in meteyard, in weight, or in measure. Just balances, just weights, a just eph and a just hin, shall ye have . . ." "A just eph and a just hin"— so long ago the need for precision arose and the need for precision implied the need for reproduction or duplication. When there was only one "hin" there was no problem; but once there were more than one, it was obvious they ought to all be the same.

continued



**“ . . . conversion is not complete.
Wine can still be purchased by
the flagon in a few backroad
regions in France.”**

**“ . . . other countries have changed
their piping standards in one of
two ways — ‘Hard’ conversion or
‘Soft’ conversion.”**

**“When there was only one ‘hin’
there was no problem; but once
there were more . . . they ought to
be all the same.”**

In our English system, many of the units are derived from anatomy. The inch, the hand, the cubit, the el, and so on. Trouble comes because people aren't all built the same. An early attempt to better this was by the master surveyor, Koebel. He stationed himself in a church square one Sunday morning in the sixteenth century. “He bid sixteen men to stop, tall ones and short ones, as they should happen to come out.” No “women's lib” then. He lined them up, left toe touching left heel, measured the total, divided by 16 and had an average value for the foot. This early attempt at standardization did establish an average value — but it didn't hold. By this century, the Chinese foot was $13\frac{1}{8}$ " long, the Japanese foot was $11\frac{15}{16}$ " long — and so on.

The thirty-fifth point which King John accepted in the Magna Carta reads: “Throughout the kingdom there shall be standard measures of wine, ale and corn. Also there shall be a standard width of dyed cloth, russet, and haberdashery: namely (a width of) two ells within the selvages. Weights (also) are to be standardized similarly.”

But it couldn't last. The “Rolls of Parliament” of 1422 mention, “A subsidy of tonnage and poundage . . .” And since the “subsidy,” or tax, was on the measures of volume and weight, it became profitable for the kings to reduce the size of these measures. The results are known to all, even to our children:

“Jack and Jill went up the hill
To fetch a pail of water.
Jack fell down and broke his crown,
And Jill came tumbling after.”

The “jack,” the “jill,” the “pail,” are all units of measure which were debased. The “crown” is King Charles who was beheaded in 1694 because he reduced the amounts of these units. Quite a tumble.

The lack of accurate reproduction of measure was imposing acute problems — not only on kings and taxes but on science and commerce. Different people at the time made proposals for improvement. Their goal: units of measure which would be more precisely defined and reproducible at any spot. One proposal was one minute of arc of the great circle passing through Paris (almost 1.855 km). The final choice, the meter, was one ten-millionth of a quadrant of a great circle. As the project was firmed, the location was changed. A 10° sector of the great circle passing through Dunkirk to a spot on the coast near Barcelona was selected. This allowed the measuring line to start and stop at sea level. Special repeating circles graduated, not in degrees but in grades, were used. An early hydraulic engineer, astronomer and mathematician, Jean Charles Borda, was a leader of this expedition. The project had advice and counsel from such as LaGrange, Laplace, and Lavoisier.

Measuring that 10° sector required 7 years (from 1792 until 1799). This permitted the meter to be defined and engraved on a platinum bar for all eternity — or at least until something better came along. Thirty-one X-shaped bars were made and two lines were engraved as nearly as possible one meter apart.



This was done at 0° C (the temperature of melting ice and water mixture). The bar that most nearly equaled the original was selected for the standard for the international prototype and it is now in the International Bureau at Sevres, near Paris.

Two bars were sent to the U.S. and given to President Harrison in 1890. One went to New York and the other, after a stay in the Treasury Department, is now at the Bureau of Standards.

This still did not end the search for precision and reproducibility in measurement. As recently as 1960, an international commission set $1 \text{ mm} = 1,650,763.73$ wavelengths of the monochromatic orange-red light emitted by krypton gas of mass 86.

Europe is metric leader

Europe and the rest of the world have been converting to the metric system for generations. At this time, there are only one or two very minor countries who are not on the metric system or who are not converting. Yet, conversion is not complete. Wine can still be purchased by the flagon in a few backroad regions of France. And we read that conversion is being met with something less than wild applause in Australia. The reason — productivity and efficiency are suffering.

But, for the most part, commerce, science and industry have switched or are in the process. Most seem to convert by a process starting with their national standards. The International

Standards Organization (ISO) is writing international standards. But they are not complete and there is not universal agreement. As good standards are generated, so the changes can commence.

In illustration of this need for good standards, we could read within the last few years, "In Sweden, the most metricated country of all, 90% of the threaded fasteners were produced to the inch standards." The reason? The then existent metric thread standards did not permit full interchangeability.

Thus, a bolt from Sweden might not fit a tapped hole from Japan — even when they were intended to be the same size and pitch. The situation is now changed. The various ISO metric thread standards do permit full interchangeability of parts. But this has only happened because of a last ditch effort by the U.S., British, and Canadian delegations. The original ISO proposals which were modified only in the twelfth hour would have resulted in major problems for U.S. production technology.

We are advised by the U.S. Fastener Institute that we will have a workable system with less items to confuse us. Anyone who has dealt with National coarse, National fine, National extra fine, the 8 pitch, the 12 pitch, and the 16 pitch thread knows what I'm talking about.

Conversion . . . hard or soft?

We can see that other countries have changed their piping standards in one of two ways — "hard" conversion or

"soft" conversion. The January issue of the AWWA Journal has an article by D. G. Larken of the East Bay Municipal Utility District titled, "Metric conversion — hard or soft." As he says, "Soft conversion leaves an item the same size and merely converts its dimensions from English units to metric units. Thus a 1" shaft becomes a 25.4 mm shaft. No other change is made."

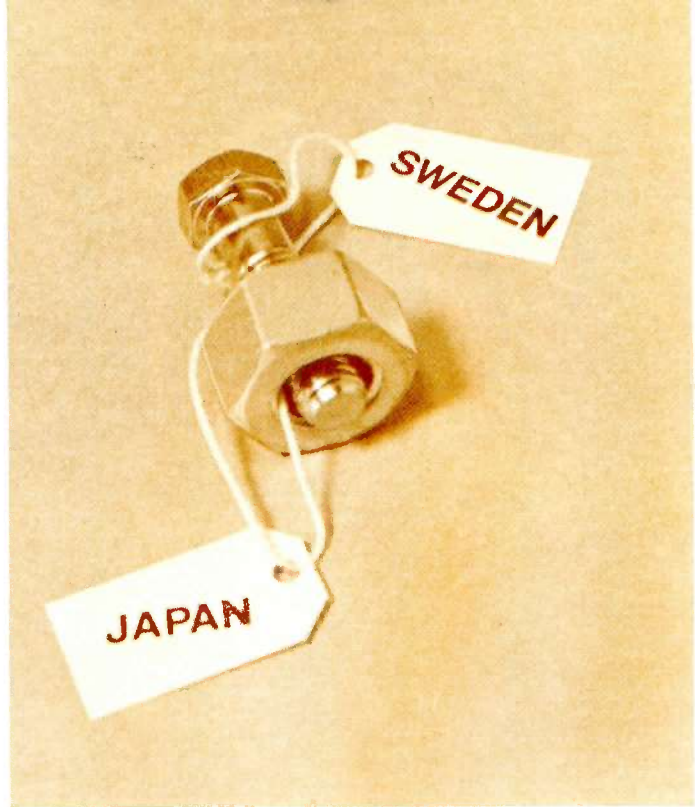
Hard conversion would not only change the inches to millimeters, but the module would change as well. Thus a hard conversion 1" shaft converts to 25 mm. The difference (.4 mm) is about the thickness of a dime — just enough in many instances to prevent interchangeability.

The reason for hard conversion is that modules are used for uniform increments of size increase. Supposedly for economic reasons, the whole world will be better off using the same modules. We are all familiar with English module pipe, 4", 6", 8", 12", and so on. Metric modules on this range would be 100 mm, 150 mm, 200 mm, and 300 mm.

Some of the ISO Pipe Standards have retained English modules although they specify in metric units. Most steel pipe is made in this fashion. I see three reasons for this:

There is no metric pipe thread as such. ISO R7-1955 "Pipe Threads For Gas List Tubes and Screwed Fittings Where Pressure-tight Joints Are Made On The Threads ($\frac{1}{8}$ " to 6")" is all there is. ISO R7 does specify the British Pipe Thread rather than the U.S. Minor differences exist, but we have found no trouble in

continued



producing fittings with British Standard Iron Pipe Threads on castings designed for U.S. Pipe Threads.

Another reason for retention of the inch module in steel pipe is the welding fittings. Large size fitting forging dies are quite expensive so there existed an economical reason.

Finally, the U.S. furnished many of the pipe mills erected outside the U.S. after World War II. We tooled them up in inch modules.

No metric equivalent for AWWA Mueller thread

There is no metric equivalent for the Mueller or AWWA thread. No ISO Standard exists. Only our AWWA C-800 covers its requirements.

Flanged fittings sold in Europe will follow ISO 2084, "Pipeline Flanges for General Use — Metric series — Mating Dimensions." None of the flanges convert for an English fit. However, in many cases, fittings designed for U.S. flanges ANSI B16.5 or B16.1 can be drilled for ISO 2084 conformance. Bolt circles are off from as little as 1 mm to as much as 32 mm in flanges up to 12".

Europe started right out with metric modules in plastic pipe. While there is a metric standard in inch modules, it is not used to any extent. It was relatively simple for Europe to start into metric modules as plastic is a new material for piping systems.

Cast iron and asbestos-cement pipe are coming more and more to metric module sizing. Recent catalogs from Europe list

only metric modules. And we see a situation in metric modules not unlike the situation in inch modules — a case where size is only relatively descriptive. For instance: A 200 mm Ductile Iron Pipe (ISO 2531) is 222 mm O.D. (8.78"), about $\frac{5}{16}$ " smaller than 8" cast iron pipe at 9.05".

Conversion coming hard in Britain

Great Britain, with its long history of inch or Imperial system usage, started the switch to metrics in 1968. It has chosen a hard way to go. Situated as close to the Continent as it is, it was rather obvious that Britain would become a partner in the Common Market. Therefore, hard conversion was almost a necessity. The CEN Standards almost always were ISO Metric Standards. It may be of interest to hear a little of the experience of the British Gas Corporation as it changed some of its piping standards. Several controlling factors were set out as the change commenced. Existing suppliers of Imperial system components were given long lead times in which to change over. Orders between all parts of the country were coordinated so that existing suppliers would be assured of continued sales during the changeover.

Levels of Imperial inventories were closely monitored to assure that they were sufficient and yet not to the point of surplus and obsolescence. Even so, lead times extended to the point that 18 months supply was necessary for some items.

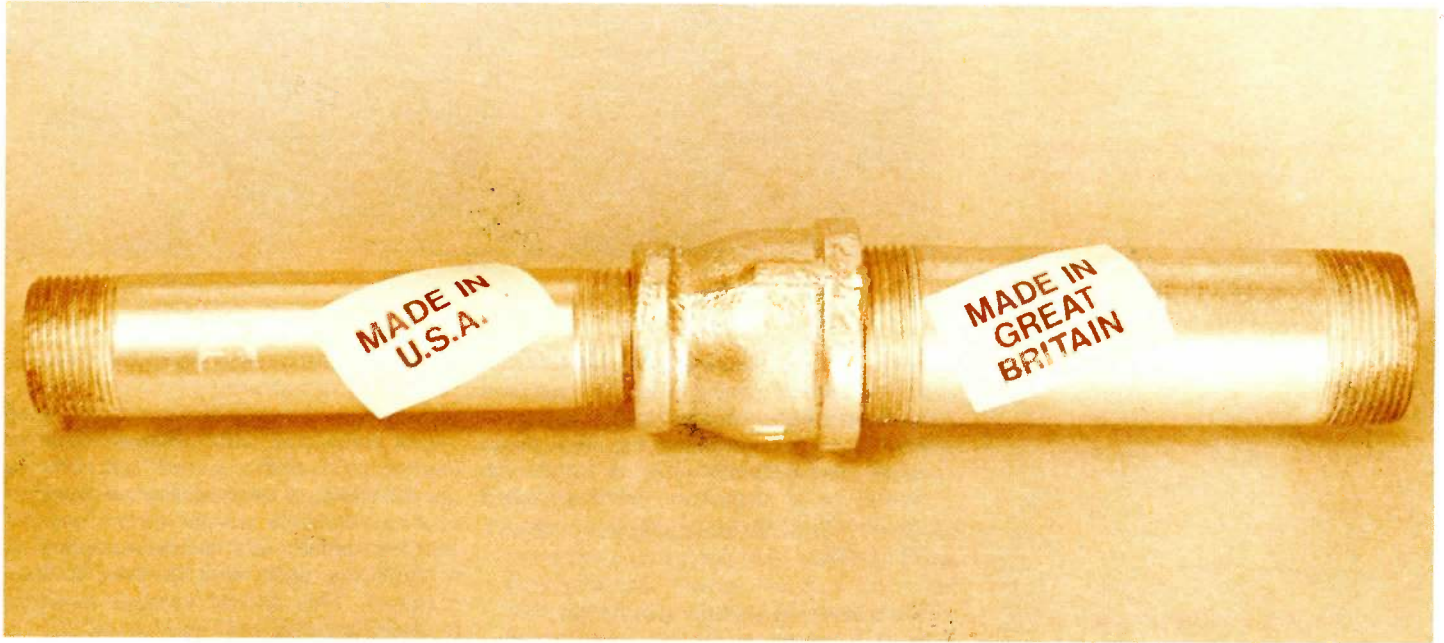
Training sessions to familiarize their workers in metrics had to be scheduled. Any new supplier, wanting to do business, could only do so with products to metric specifications.

The greatest problem reported was that of insuring a long term supply of "change" or transition fittings to convert Imperial system piping to the metric system piping. Yet we have been told by our licensee in Great Britain that this was a time fraught with troubles. They were and are producing fittings to ISO Metric Standards, to DIN Metric Standards, to some particular country's metric standards that they happen to do business with, and finally to the old Imperial Standards. The Gas Board's job was complicated by the fact they were also converting cast iron pipe from gray iron to ductile iron during the Imperial to metric conversion. Great Britain's plan was in marked contrast to that of Canada. As you probably know, Canada is opting for soft conversion.

We in the United States can hardly pick up a trade journal today without finding something about our own conversion to metrics. Many industries are already making the change. We read where the "Chevette" was produced entirely in metric dimensions and to metric modules. Caterpillar no longer puts dimensional units on its drawings. Instead, it furnishes a computer print-out which is stapled to the side of each drawing. This print-out lists each dimension in the units of the particular country where that drawing is intended to be used. Milk, soft drink, beer and liquor con-

“... a bolt from Sweden might not fit a tapped hole from Japan ...”

“Some of the ISO pipe standards have retained English modules although they specify in metric units.”



tainers are now in trial markets and regional stages of introduction of metric containers.

Water Industry must plan

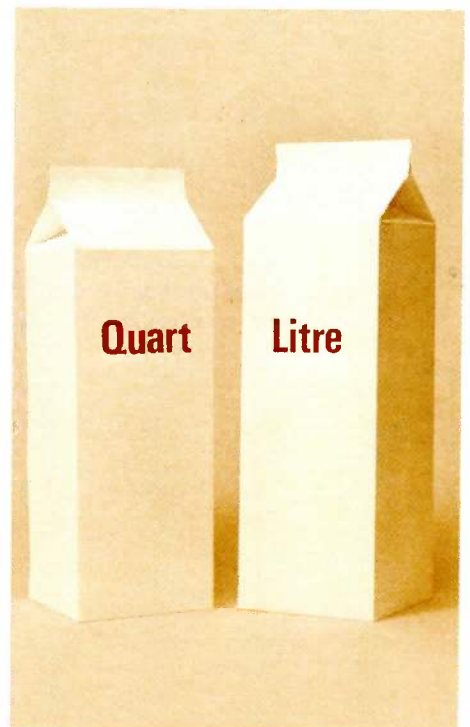
What does all this mean to us who are concerned with our water supply? For one thing, it means that we need to do some careful planning. The water industry has to decide on hard conversion or soft conversion. I know that my company does not intend to tell you which choice to make. We do plan to stay in business, we do hope to keep serving you, and this means that we will have to offer you products you want. For some years now we have produced our shop drawings with dual dimensions. That is, we have both U.S. and metric units on each drawing. Even so, it has been estimated that it will take 600 man years to convert our engineering drawings and records to metrics. And this is just a soft conversion. A hard conversion would mean tooling changes as well. We have not attempted to estimate the

time or the cost outlay for tools and equipment. I would like to go into some of the factors which ought to be considered as our industry decides whether we will indeed play “follow the litre.”

While all countries may have adopted the S.I. Metric System, they have not all adopted the ISO standards. The politics of ISO are considerable and national self-interest is still so high that unanimous agreement in the near future seems unlikely. I mentioned that twelfth hour decision that permitted the ISO metric thread standards to be based on current U.S. Industrial Technology. We certainly will not prevail with our position on all items. I am not just “crying wolf” here. There is a basic difference in quality levels accepted in goods outside the U.S. Even metric standards vary from country to country. Thus, each market for a product to a given standard is limited. As a result, manufacturers are often reluctant to invest in improved designs.

Mueller Co.'s analysis would indicate that this is particularly true in the water

continued



"There is no metric equivalent for the Mueller or AWWA thread."



"... we see a situation in metric modules ... where size is only relatively descriptive."

"The water industry has to decide on hard conversion or soft conversion."

works supply industry. Many of the products which we bring over for test and analysis simply do not measure up to what you are used to buying. This would mean that a choice of hard conversion would be a departure from accepted standards for many of the items you are now using.

No universal metric standards

At this time there is no universal set of metric standards. ISO can not even decide on the proper spelling of the word "meter" and they are still hung up over the choice between bars and pascals. With many companies in England producing to as many as three different metric standards, as well as to the old Imperial system the production and inventory problems are almost unmanageable. This tells me that even if hard conversion is the ultimate choice, this is not the time to make it. Costs of hard conversion for the producer will increase product costs which must be passed on to the consumer — or some manufacturers will have to drop out of business.

The ISO system of standards is not changed and updated as frequently as existing U.S. standards systems. Current U.S. practice is to review, then revise or re-affirm at least every five years. Many ISO standards on our list date back to the 1950s. A choice for hard conversion could limit our industry's ability to utilize latest technology.

I've mentioned our 600 man-years of effort just to make our records metric

in a soft conversion. Think of your costs for hard conversion:

Record systems will have to be modified to identify whether an item is inch or metric. Some record systems may need redesign because they are incapable of this in their present form. Inventory stock of inch units, metric units, and the transition units will have to be maintained. This should increase inventory costs for us all.

Two sets of equipment will be required — inch and metric. Service trucks will have to be stocked jointly for inch and metric products and equipment or separate trucks will have to be set up. Mistakes will be made in mixing the components of each system. These will add cost. Training will be a cost either way.

It seems to me that the water industry's job of managing a soft conversion will make Mueller Co.'s seem like peanuts. The added cost of hard conversion will mean that huge chunks of scarce money are going to be obligated — to respecify, retool, restock, recatalog and make the other necessary changes this will entail.

We should not lose track of the reason often given for U.S. conversion. Many of these reasons argue for metric use and do not necessarily imply hard conversion:

A. Use one measuring system so people in all countries can better understand each other. If I say 50 km from Portland, someone from Paris has a clear understanding of just how far I mean.

B. The metric system is simpler. This has been much debated. It may be



“... double stocks will be with us for a hundred years or more.”

“The meter was defined and engraved on a platinum bar for all eternity — or at least until something better came along.”

true, but is the enjoyment of the destination worth the trip to get there?

C. The metric system is based on more fundamental units. This is no longer true. By law our inch is 25.4 mm and by law our pound is 0.453592437 kg. Our units now are as precise and as fundamental as the meter and the kilogram because they are tied to them.

D. Many hope that U.S. adoption of the metric system will foster international trade. Possibly, but trade will have to work both ways or one country ends up with all the money. Governments, city or federal, will not and can not sit idly by if massive unemployment results from having universal designs and one country having lower cost products. And if unemployment did result, who would do the buying. The U.S. is particularly vulnerable in this regard because of our generally high labor rates.

Seriously, when Mueller Co. looks at international trade, and we do, we look at each product line of trade. Each has to carry its individual cost of business with it. We do not expect our U.S. customers to bear the cost of products for France. Or the French to bear the cost of products for Germany.

The New England region uses a lot of specials — heavier bodied brass valves and the like. A choice of hard conversion will have to consider these “specials”. In a sense, you have already paid your dues to get tooling for their production. If you decide to keep them in inch modules, there is no big problem — just

drawing changes and allied costs. But change “specials” to a hard conversion and the problem of new dues will come up. Someone will have to pay for that tooling. Or you may not get to keep your “special”.

Many manufacturers have reported that the switch to metrics has cost less than they planned. Maybe so. But the ones who are saying this are in the “normal-product-life” type of business. A typical consumer product has a life span of 7-10 years. This happens to be the span estimated for U.S. conversion to metrics. I believe that our water industry is particularly vulnerable to a hard conversion. Our products are so long lived. A choice for hard conversion will mean that the transition items, the dual equipment, the double stocks will be with us for a hundred years or more.

Most of the points I've made seem to argue for soft conversion. It is true that hard conversion will make it easier for the large international corporations to improve their position in world trade. I leave it up to you to decide if your cost of hard conversion is worth their improved position in world trade.

If you do have opinions, make them known to your standards writing people. These are the bodies who will make our decisions for us.



One hundred years of double stocks? That's a bit much to contemplate

Why does Mueller Co. favor a gradual or "soft" conversion to the metric system over an abrupt "hard" conversion? Its products last so long is one reason. In some water systems, Mueller products more than 100 years old are still performing well. But now and then replacement parts are needed.

A soft conversion to the metric system would leave such pieces the same size as before but would give them a metric dimension instead of English. Thus they would continue to fit older components in a water system.

A hard conversion, on the other hand, would do more than just change inches to millimeters. It would require that the module be changed. (The dimensions would change, and interchangeability would become impossible. Thus, the

maintenance job would not be limited to changing a valve. Dual adapters would also be needed to match old to new).

Hard conversion means that a company such as Mueller will have to continue manufacturing products to fit pre-metric water systems. And to serve new water systems, it will have to manufacture other products to strict metric scale.

"A choice for hard conversion," explained Mr. Floren in his speech to water officials," will mean that the transition items, the dual equipment, the double stocks will be with us a hundred years or more.

"Our industry is particularly vulnerable to hard conversion. Our products are so long lived. Many items installed last year will be around for the Tricentennial."

Power operator empties shop

Wilson Machine Co., Inc., Hutchinson, Kansas, manufactures the power operators (H-603 and H-604) for Mueller Machines. But Wilson employees had never seen the products they build for Mueller in use — in the field. That was until recently.

Hutchinson, a suburb of Wichita, was recently annexed to the city and for the first time was able to get city water. One day, Mrs. Elizabeth Wilson, president and chief financial officer of the Wilson

Machine Co., noticed that most of the 40 employees were missing from the building. She found them standing around a ditch, watching a plumber from the Warrington Plumbing Co. of Hutchinson install a corporation valve in a section of the new system. He was using a Mueller B-100 Machine with an H-603 power operator. After a few appropriate comments from Mrs. Wilson on the need to build more power operators for Mueller Machines, the employees went back to work.



MUELLER NEWS

Board Elections



Mr. Michael R. Mueller was elected a member of the Mueller Co. Board of Directors at the annual meeting of the shareholders held in Decatur on May 3. He is a Senior Analyst with Connecticut General Life Insurance Company of Hartford, Connecticut. As a member of the Mueller Co. Board, he is the sixth great-grandson of the founder of the company presently serving in that capacity. He is the son of Mr. and Mrs. Frank H. Mueller of Decatur.

Other members re-elected were:

Dudley J. Godfrey, Jr.
Robert V. Krikorian
Adolph Mueller II
Mrs. Bessie I. Mueller
Frank H. Mueller
John S. Mueller
Philip M. Mueller
John A. Schluter
Mrs. Lenore M. Schmick
A. E. Staley III
Harlan A. White



The girl with the million dollar voice

Many who have called the Mueller Co. office in Decatur, Illinois, have been impressed by the voice of telephone operator, Norma Enloe. They say she has the kind of voice any woman would love to have — and any man would love to listen to.

What does such a person with such a voice look like? This is she.

Norma is a native of Decatur. She's an outdoor type who enjoys horseback riding, hiking and water skiing. During her at-home hours, she restores antique furniture. And she's never studied voice!

Norma Enloe, Decatur, Illinois, telephone operator.

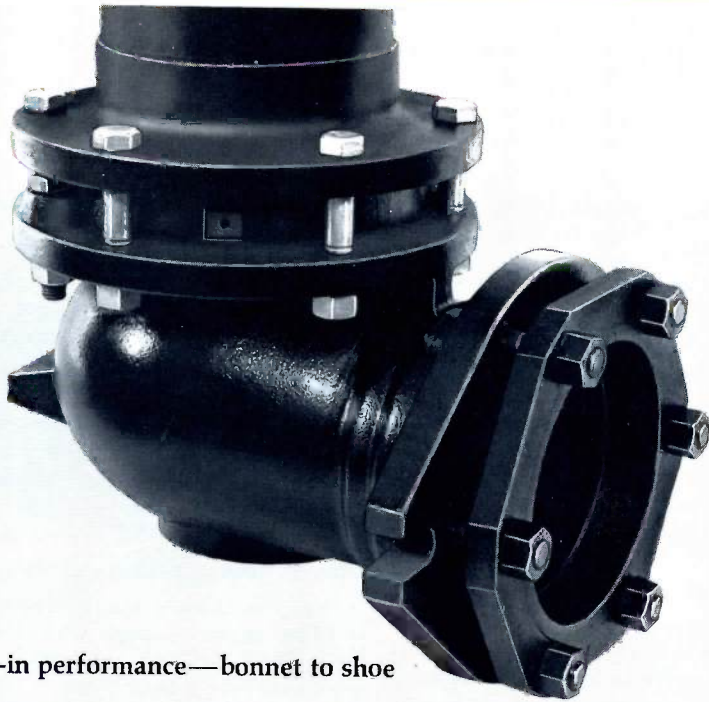
FOR THE EXTRA MARGIN OF PERFORMANCE

EFFICIENT DESIGN FOR MAXIMUM FLOW..THE MUELLER® CENTURION® FIRE HYDRANT

The real test of a fire hydrant is in its flow characteristics—under actual operating conditions. That's where the Mueller Centurion Fire Hydrant performs best.

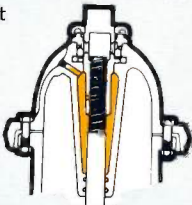
The Centurion Fire Hydrant is designed with smooth transitions and long radius internal contours to keep turbulence to a minimum even at high flow rates. It's well within AWWA Standards for pressure loss characteristics. The patented Mueller design (Patent No. 3980096) really pays off under actual operating conditions with minimum pressure loss and excellent flow . . . right out to your pumper and hose nozzles.



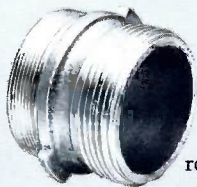


Built-in performance—bonnet to shoe

The dry-top design with self lubricating system assures easy operation even after years of service. All stem threads and bearing surfaces in the operating mechanism are lubricated each time the hydrant is operated. A thermoplastic anti-friction washer further assures easy operation throughout the life of the hydrant. O-ring seals are used to retain the lubricant in the reservoir while sealing out water and contaminants—stuffing box bolts and packing adjustments are eliminated.



Hose and pumper nozzles are threaded in for easy replacement if damaged or for changeover to different thread style. A special locking method makes insertion simple.

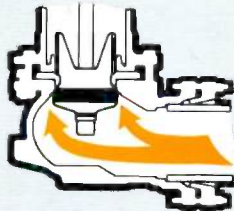


And the nozzles can be faced in any direction simply by loosening the safety flange bolts and rotating the upper barrel assembly.

The safety stem coupling and safety flange design help minimize traffic damage to the hydrant. The safety flange on the barrel breaks cleanly and the safety stem coupling pulls apart to prevent or reduce damage to the upper barrel, lower barrel and stem. The main valve remains closed and service is easily restored by simply replacing the broken parts with the low cost repair kit.

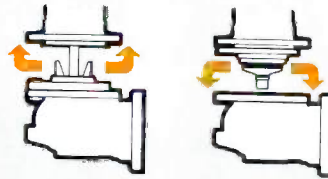


The compression type main valve closes with pressure for positive seal. Its conical shape assures smooth flow and low pressure loss. Double drain valves are force flushed each time the hydrant is operated and assure complete drainage of the barrel.



The patented shoe has been carefully designed with smooth transitional contours to assure maximum flow with minimum head loss. The specially contoured shoe also has large blocking pads for easing setting and two lugs for strapping. (Strapping lugs are not provided on flanged connections.)

A unique bolting arrangement lets you remove the lower barrel should repairs be needed, or remove the shoe to change end connections—without disturbing the main valve or seat ring assembly.



Good fire protection starts at the hydrant. Put the dependable Mueller Centurion Fire Hydrant to the test. It meets AWWA Standard C-502 and is well below the limits for pressure loss at all flow rates. Available in a choice of sizes and inlet connections. For complete details, contact your Mueller Distributor or Mueller Sales Representative, or write direct.



MUELLER® CO. / **DECATUR, ILL. 62525**

Factories at Decatur, Ill., Chattanooga, Tenn., Albertville, Ala.
MUELLER LIMITED, Sarnia, Ont., St. Jerome, Que. Canada

-serving the water and gas industries since 1857

W-7714

Citizens groups are taking action to cope with ever-increasing water shortages

Although scattered, sporadic showers eased the rainfall crisis at midsummer in some areas of the U.S., other areas are still in the grip of long term water shortages. Some so serious that citizens groups have organized to prod water boards and other agencies into making better use of dwindling water resources. Others so serious that traditional migrations of people to those areas may cease. But nationwide, changes in precipitation patterns have had their effect.

Rains this spring were too little and too late

Spring rains did come. However, throughout many areas of the West and Midwest, they were too little and too late. Crops, particularly in California, were seriously damaged, according to state agricultural experts. And in those areas where water is used to generate electricity, shrunken lakes, reservoirs and rivers brought power curtailment. In some California counties, water rationing was the order of the day. Beef herds have been sold off because farmers and ranchers couldn't afford to feed and water them. And beef, plentiful today, may soon become a scarce and expensive commodity.

Midwest conditions mixed

In the grainbelt conditions were mixed press reports state. Some areas expect production to equal or better last year's crops. Others face reduced production because dry weather extending through planting and early growing season gave crops a poor start.

Unseasonably hot weather this summer took valuable moisture from the soil through evaporation in some regions, while wind accomplished the task in others. Farmers in some areas were forced to sink deeper wells to find an adequate source of water.

Dixie dry, too

Meanwhile, as spring changed to summer, the South faced dry conditions, unusual for this area where rainfall is normally high — and predictable. There were reports of damage to the peanut crop, among others. And, as the dry weather persisted, several states asked for Federal aid.

Some weather experts cited last year's change in the jet stream as the culprit. This change, while credited with holding the usual number of storms and hurricanes reaching the South Atlantic coastline to a minimum, also kept the rain at bay. The jet stream, U.S. Weather Service Meteorologists report, resumed its normal flow across the country during early summer. And that means more storms blowing in from the Atlantic Ocean — and very likely, normal rainfall for the region.

The experts predict

Water, some experts warn, will not be plentiful much longer. It will become difficult and expensive to irrigate farmland in arid areas. Even swimming pools in some places will probably become a thing of the past as conservation orders will dry up many private projects. Power use will have to be curtailed in some

Falling ground water levels book well drillers up for months in advance.

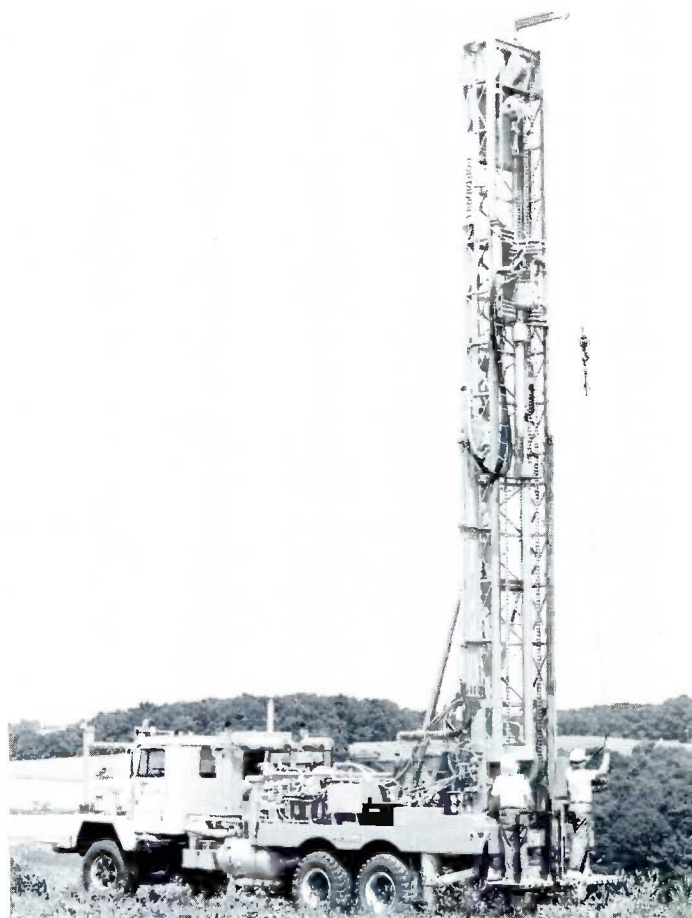
regions that rely on hydroelectric current. As a result, it has been predicted people won't be able to migrate freely to such fast-growing areas as Arizona and west Texas. The reason? There's not enough water to support a growing population.

The 1977 water scarcity in the West and Southwest is only a sample of what other areas of the U.S. will feel in the next decade. By 1990, According to the National Weather Service, every year may be a water-short year.

Citizen groups nudge agencies

In many of these areas, however, action is being taken to cope with the problems. Informed and concerned citizens are now taking a hand in water planning, reports Bernie Heare, engineering manager of the Marin Municipal Water District in Corte Madera, California. These citizens groups are locking horns with

continued





In some areas, swimming pools may have to remain dry.



Use of treated wastewater for irrigation is becoming an important conservation measure.

those agencies that insist on single-purpose planning. They are demanding that water agencies, sewer agencies, cities, counties and other such entities work together in developing and implementing plans that will fulfill community needs.

The public is insisting that those water agencies who have not done so in the past, develop programs that will conserve water. Further, the public along with many forward-looking water agencies are concerned with finding uses for wastewater, such as irrigating parks and golf courses, even agricultural irrigation projects.

Wastewater reclamation

Wastewater reclamation and reuse are becoming increasingly important to the future water supply of Southern California says David G. Argo, district engineer, Orange County Water District. Writing in the *Water & Sewage Works Magazine*, he describes a 15 mgd wastewater plant which uses the technology of the Twenty-First Century to manufacture fresh water. The plant, which treats filtered secondary effluent, includes lime coagulation, ammonia stripping, two-stage recarbonation, mixed media filtration, activated carbon absorption, chlorination and blending. This "manufactured" water is injected into the aquifer underlying the area to prevent the intrusion of seawater inland which could cause widespread damage. By developing this water factory, the district is able to augment its well field and maintain its viable water supply.

Dual water systems coming?

About 60% of all water used in the home is for toilet flushing, car washing and lawn watering. None of these requires high quality water. Large amounts of water used in the industrial, commercial and public sectors are for uses which also do not require the highest quality. A large volume of water is used in fire fighting, in public parks and display fountains. In view of this, it makes sense to establish a hierarchy of water supply, with the quality of water adapted to the use for which it is best suited, claims Aaron K. Deb of Weston Environmental Consultants — Designers, West Chester, Pennsylvania.

As only a small fraction of household, commercial and industrial water must be of drinking quality, the volume to be treated by expensive and sophisticated processes would be small enough to allow economy in treatment, he explains. The non-potable portion could receive only the usually less costly treatment processes. It would, however, have to be disinfected to allow for occasional ingestion. In fact, it would remain at about the quality of existing supplies in some communities with supply problems affecting total water quality.

Two qualities of water, potable and non-potable, could therefore be supplied economically through separate distribution systems. In dual supply, the potable water would come from high quality sources or would be treated beyond present standards to improve its quality. The non-potable supply could come from inferior sources, including the recycling of wastewater which could have a tremendous impact on conservation. Comparative cost studies reveal that the dual system is less expensive than the conventional system which requires demineralization of the potable supply.

Dual water supply systems have been used in Hong Kong, the Bahamas, Catalina Island, and other parts of the world. In Singapore a part of the filtered wastewater is used for manufacturing processes and toilet flushing. Colorado Springs, Colo. uses about one third of its treated wastewater after filtration, disinfection and storage through a separate distribution system for irrigation of college campuses, cemeteries, golf courses and for other large users.

In England and Wales about 40 water projects are dual systems. St. Petersburg, Florida, plans to use reclaimed water for lawn sprinkling because of the limitations on the available supply of fresh water. These measures will conserve up to 40% of the good quality, but limited groundwater supply.

New water can't be created

Water, like energy, is a commodity no longer in abundance. But unlike energy, it can't be created by harnessing the atom, the sun or the wind. The earth contains a specific and non-renewable amount of water. It can't be destroyed, but it can be polluted or wasted in such

a way that less and less of it becomes available for human use. However, desalination plants, wastewater reclamation systems, conservation and enlightened water use may help assure that the available supply of water is used for the greatest benefit of mankind. The technology is being developed. The need to use it is being recognized. And with an increasing awareness of the alternatives, mankind can look forward with a greater degree of hope that adequate supplies of water will continue to be available when and where they are needed.

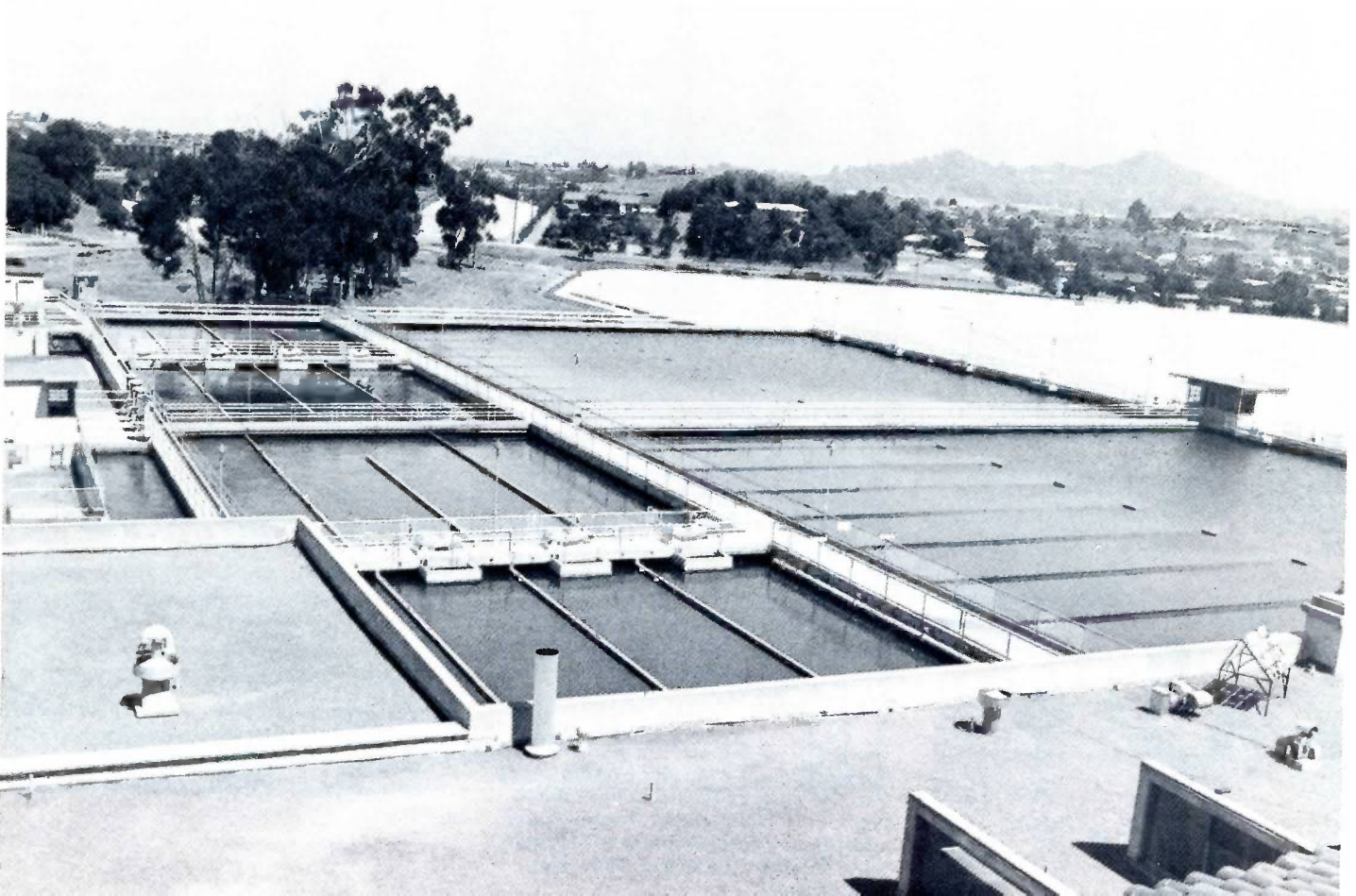


Car washing and some other uses could use reclaimed wastewater.



Top priority must go to water for irrigating croplands.

Water districts are developing technologies for wastewater reclamation.



Hydrant Highlights

Why fate has picked fire hydrants to play so many special roles is not fully understood. Maybe it's because wherever you look there are fire hydrants. This alone makes them vulnerable to all sorts of singular events and uses. Another reason may be that fire hydrants are regarded in somewhat the same fashion as the teddy bear — an old and beloved institution harking back to childhood. Whatever the reason for their roles, these hydrants are worth meeting.



A break with tradition created problems for citizens in this town.

Judge hands down milestone decisions in mistaken identity cases

Yes, this *is* a fire hydrant. The only things that give it away are the nozzles. But a local judge in a small town near Placentia, California didn't think it looked like a fireplug. So he dismissed cases in which motorists were ticketed for parking in front of it . . . or any others that looked like it.

If this sort of thing keeps up, firemen will have to resort to charts, like those the military uses to identify ships and aircraft, to locate hydrants in case of a fire. J. Kenny Potts, Mueller Representative from Placentia provided the photo.

Installing this Mueller hydrant was an inside job

Dick Kahl, Mueller Representative in Farmington Hills, Michigan, reports that when a Mueller hydrant was installed at the recently completed Thomas



That's a Mueller fire hydrant way up there.

Everything's big in California . . . even fire hydrants.

No, Paul Bunyan did not install this fire hydrant. J. Kenny Potts who worked on this project for the Crestline Village, California, County Water District Office, snapped this picture. It was the district's salute to the U.S. Bicentennial. It's a Mueller hydrant, of course. Maybe one could say they're big on Mueller hydrants in California. Kenny, who has a finely developed news sense, also sent a newspaper clipping from the Orange County "Register". A photo showed a Mueller hydrant covered by a swarm of bees. A police sergeant, who happens to be a beekeeper, removed the swarm.

Township Fire Station in Saginaw, it was an inside job. It was placed inside the station to provide water for the department's tankers, and for training purposes. This is the first Mueller hydrant put into the system in Saginaw, Dick reports. It could open the door to more Mueller installations. It certainly has an *inside* chance.

Checking out the Mueller hydrant inside the new Thomas Township fire station are, L to R: Norman Bell, Twshp. Supervisor; Buck Wiltse, Water Supt.; Richard Kahl, Mueller Central Dist. Rep.; and John Greene

INDUSTRY NEWS

Last winter's frigid weather wreaked havoc on water systems.

Water system officials in many parts of the U.S. are praying that the winter ahead will be milder. Milder than the last which wreaked havoc with water service in many areas.

An AWWA survey of 14 water systems in the Midwest and Southeast showed a 1000% increase in frozen home water service pipes and meters as a result of last winter's frigid temperatures. Water mains under the streets were breaking at record rates — 40% more than the previous winter.

The Detroit Water & Sewage Department reported that from November, 1975 through January, 1976, 560 broken water mains were repaired. The department estimated that by year's end, the number will top 800.

Philadelphia reported 300 water main breaks compared with 70 during a normal January, and 200 additional breaks in February adding up to \$2,000,000 to the average water main winter repair costs.

Mueller Co. pipe repair products are popular items with the water departments in many of these and other cities throughout the country where severe weather resulted in extensive water main and service pipe ruptures. Mueller Adams® repair clamps solve such problems quickly. They are designed for exceptionally long service life and ease of installation. Several styles are available for pipes from 3/4" to 30".

Installation of larger water mains has energy-saving benefits.

With energy costs increasing, the lower frictional resistance of larger diameter pipe becomes an important design consideration.

In the last few years, the percentage of 14-inch or larger pipe of the total mileage installed is about twice that of such pipe in place.

The increased demand for the larger pipe has led pipe manufacturers, other than those supplying the traditional cast iron and ductile iron, to develop a new series of pipe classes in these larger sizes.

This development is intended to permit the designing and specifying engineer to select pipe size in terms of maximum economy, in keeping with good engineering practice.

A PAGE FROM THE PAST

Historical notes, sidelights, anecdotes and items of interest dealing with the subject of water distribution in the early days



This old-fashioned fire alarm box doubles as a fire extinguisher cabinet.

Old-time fire alarm box doubles as extinguisher cabinet

This reproduction of an old-time fire alarm box, used to house a modern fire extinguisher, is an interesting adaptation of a colorful and historically appealing item. A salute to nostalgia, says the manufacturer.

The Fire House extinguisher is advertised as an appropriate item for mounting in the kitchen near the range, but it could be placed almost anywhere in the home.

Is that a Mueller hydrant at the top of the call box?

Off the Record



"Judge," said the accused, "can you give me a sentence with the word 'freedom' in it?"

"Economy size" means large in detergents and small in automobiles.

Attempts to reduce paperwork in D.C. have failed because of the vast amount of paperwork involved.

"My mother-in-law has been living with us for nine years and she's driving me nuts."

"Why don't you ask her to leave?"
"I can't. It's her house."

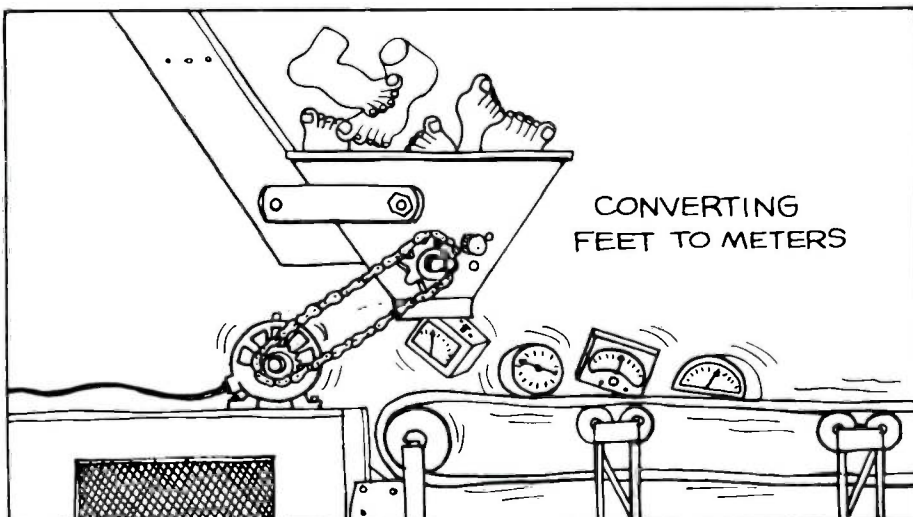
When John McKay was coaching at USC, he had a first-year quarterback named De Mirjian who warmed the bench. But De Mirjian had a lot of friends and at each game they'd sit in the stands and holler, "We want Dee-Murr-Junn!" over and over again. This irritated McKay.

On Saturday during the crucial point in a game, it looked like the rookie quarterback would finally get his chance. When the gang in the stands began their chant, McKay looked down the bench and beckoned to him. De Mirjian clamped on his helmet and came running. McKay said to him: "A bunch of your friends up in the stands are calling for you. Go up and see what they want."

Today's question: When sign painters go on strike, what do they carry on the picket lines?

Americans will pay any price for freedom. If you don't believe it, look at the divorce statistics.

If you think nobody cares if you're alive, miss a couple of credit payments on your car.



BULK RATE
U. S. POSTAGE
PAID
DECATUR, ILLINOIS
Permit No. 1

FOR THE EXTRA MARGIN OF CONVENIENCE

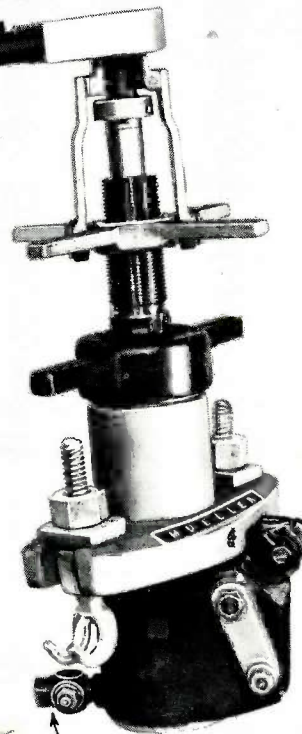
MUELLER® B-100 TAPPING MACHINE HAS NEW CHIP FLUSHING VALVE!

Now, in addition to giving you the ability to make watertight service connections efficiently, accurately and in minimum time without interrupting service, the Mueller B-100 Tapping Machine helps you do the job *without getting chips in the main!* A new valve, in the lower body lets you continually flush chips away during the drilling and tapping operation on all kinds of pipe.

Other B-100 Features:

- Boring bar has three bearing points for perfect alignment
- Double chamber design for easy handling, operating flexibility
- Choice of hand or power operation
- Choice of precision drills and taps for insertion of Mueller Corporation Stops

Contact your Mueller Distributor or write direct for further information on the Mueller B-100 Tapping Machine with the new chip flushing valve.



CHIP FLUSHING VALVE

MUELLER® CO.

DECATUR, ILL. 62525

Factories at Decatur, Ill., Chattanooga, Tenn., Albertville, Ala.
MUELLER LIMITED, Samia, Ont., St. Jerome, Que., Canada

serving the water and gas industries since 1857

W-7715