

WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER

Editor's Note: David T. McLaughlin, chairman and chief executive officer of the Toro Company, addressed the Los Angeles Rotary Club recently on the subject of water, something we can't do without but take for granted. I'm certain you'll find his remarks interesting and provocative; perhaps disturbing.

Something very serious is happening to water that should be causing widespread concern.

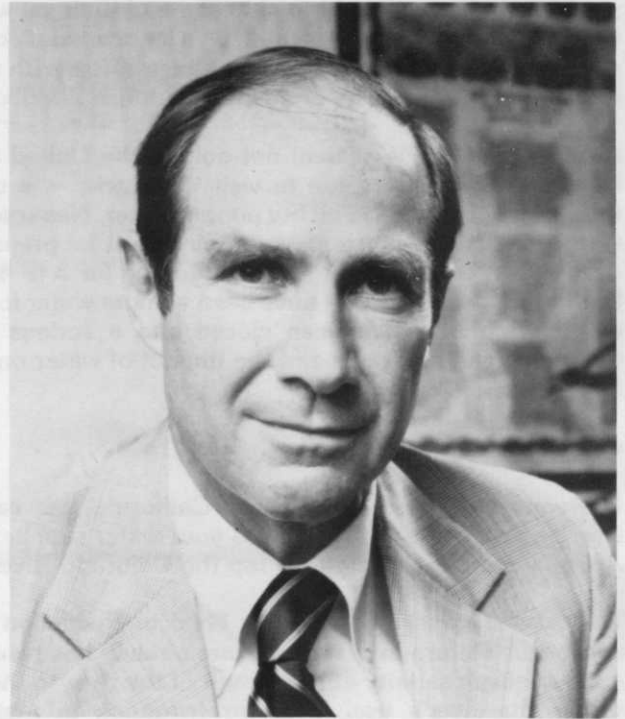
The availability of fresh water — our access to fresh water — is rapidly diminishing.

It is diminishing because more and more people in our society are finding more uses for it. We are using it, wasting it and polluting it on a scale unprecedented in the history of man.

It is diminishing because the total amount of water available on earth is the same today as it was at the beginning of time. Fresh water amounts to less than one percent of the total water supply. The balance — the other 99 percent — is in the oceans or locked up in the polar ice caps.

While I do not want to cast myself in the role of alarmist, a convincing case can be made that a crisis is building.

It is unfortunate, but true, that our society has become crisis oriented. It takes some catastrophic event or some action that deeply affects large numbers of us in a personal way before we react with sufficient collective force to cause something to happen.



By DAVID T. McLAUGHLIN
Chairman & Chief Executive Officer
The Toro Company

And then our reaction tends to be hasty and impatient — demanding quick solutions.

A case in point, of course, is the recurring energy crisis. In spite of severe disruptions caused by the 1973 oil embargo and in spite of repeated admonishments to curtail use, we continue to act as though the supply of fossil fuel were unlimited.

That same kind of attitude followed the disastrous drought three years ago that disrupted lives and livelihoods here in Southern California, in the Bay area of northern California and many other parts of the U.S., including my home state of Minnesota.

We have blithely fallen back into our old wasteful ways of water use.

There are other similarities between the energy crisis — which is real — and potential for a water crisis — which is not yet with us but which could be far more disruptive and hurtful.

Both have deep-seated implications. We experience the consequences of conflict with respect to oil almost every day. Conflicts over water reach much farther back into history — to Biblical times — but the forces of conflict continue unabated to this day, as you well know.

The U.S. News Washington Letter, published by U.S. NEWS & WORLD REPORT, warns in a recent edition that insufficient snowfall in the Cascade Mountains this past winter threatens to reduce the harvests of fruit, seed grains, vegetables and other crops in Oregon, Washington, Idaho and California.

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I am sure that a number of people in Chicago last winter would have been pleased to ship some of their snow to the Cascade Mountains rather than have it accumulate on their streets, sidewalks and driveways. The problem with respect to water is not only one of quantity but also distribution.

And the problem is evident not only in the United States: Last week I had occasion to visit Venezuela — a country that ironically is rich in oil but poor in water. Newspapers in Caracas carried reports that the city must be prepared to deal with a water shortage and rationing for 3 to 4 years. Some sections of the city have been without water for 2 to 3 weeks. Schools have been closed and a serious health hazard threatens because of the impact of water on urban sanitation.

Closer to home:

Everyone who lives in southern California has cause to worry about what will happen to your water supplies when Arizona exercises its right to tap the Colorado River.

That also is causing concern in Mexico. Reduction in the flow of the Colorado in recent years already has resulted in an increase in salinity at the mouth of the river to the point where the river's usefulness for irrigation in Mexico is threatened.

Rapid population growth in Colorado has resulted in huge increases in demand for surface water in that state. This has resulted in bitter conflict and numerous lawsuits between rural and urban interests. The repercussions can be expected to spread to all of the states downstream from the major rivers that flow out of Colorado — the Rio Grande, the Arkansas, the South Platte, the North Platte and, the one I just mentioned that's most important to you — the Colorado.

So, while there are similarities between the energy crisis and the threatening crisis over water, there are important differences. The big difference is that mankind could survive without mechanical energy but we could not survive without water.

We are not, at this point, talking about survival. We are talking about the potentially crippling consequences of water shortages on a local, regional, national and international scale.

While I cannot present myself as an expert on the subject of water, I have felt compelled to acquire sufficient knowledge about water science and water management to understand how this complex infrastructure works.

From that learning process I have become convinced that we are headed for trouble if we continue our wasteful use of water. Also there are atmospheric anomalies and phenomena occurring that no one seems to understand fully but which could further compound all of our water problems and disrupt historic distribution patterns.

In a natural state, water that is taken away is soon replenished by the hydrological cycle. But we have upset the natural balance to such an extent that the hydrological cycle cannot replenish or purify our water at the rate we are using and polluting it.

Prior to the invention of mechanical energy, most water utilized for beneficial use was drawn from surface waters — rivers, lakes and streams — from rainfall or from shallow underground lakes.

In more recent times, we have literally mined many of the great aquifers; for example the Ogallala Aquifer that underlies much of the Central Plains.

Water is being pumped from the aquifers and other underground water sources for residential, industrial and agricultural purposes at rates far greater than they are recharged, resulting in subsidence — the sinking of the land. That is happening at a frightening pace in many parts of the U.S.

In addition, of course, we have contrived countless ways to impound and collect water and to divert it for various purposes.

All of this upsets the normal hydrological cycle.

Precipitation on land and sea and the melting of the glaciers and snowcaps that produce fresh water that enters the watersheds, recharges the groundwater tables and flows into the sea and then the condensation, evaporation and transpiration that send moisture back from the land and the oceans into the atmosphere to produce more precipitation — that entire cycle is driven by solar energy.

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Beyond man's practice of depletion and contamination, the scientific community now warns that something more fundamental may be happening to distort the normal hydrological cycle.

The Food and Climate Forum of the Aspen Institute for Humanistic Studies — which my company is financing along with 8 other U.S. corporations — is attempting to determine, among many other related objectives, to what extent and in what ways the world's climate is responding:

- To changes in the sun's radiative intensity.
- To changes caused by man's injection of carbon dioxide into the atmosphere, thereby creating a "greenhouse effect".
- And by changes caused by irregular solar patterns and sunspot activity such as those suspected of diverting the jet stream and disrupting the flow of moisture-bearing air masses over California in 1972 that resulted in drought and huge losses to farmers.

The Forum has urged, and I quote from a recent report:

"Agencies responsible for water allocation in California must take a hard look at their priorities. Increased availability of water will not ameliorate a future drought if the additional resources are employed wastefully or are used as a means of justifying further urban growth."

What all of this means is that the potential for crisis based upon our waste and misuse of water and based upon baffling occurrences in the solar system that affect weather and climate is ominous.

What should we do about it?

All sorts of solutions have been proposed:

- Iceberg towing.
- Cloud seeding
- Construction of new dams, canals and reservoirs

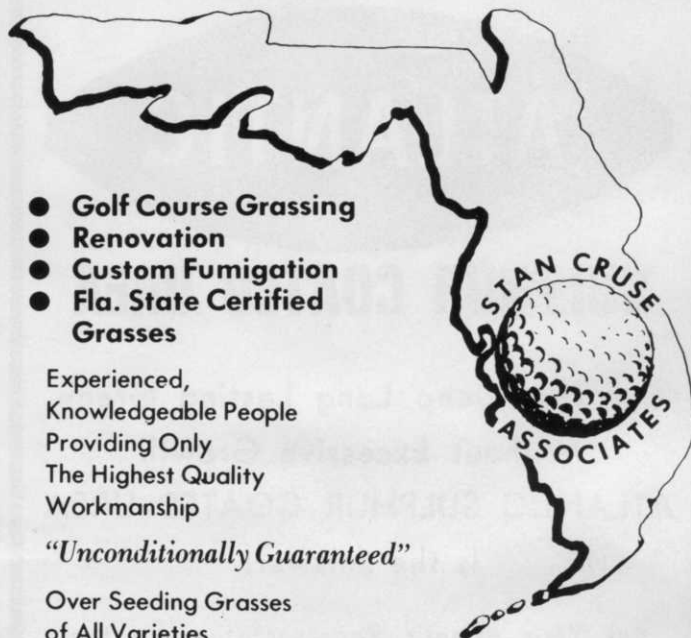
Some of these proposals are feasible but most are not without controversy.

There is cause for cautious optimism that we'll find ways to desalinate the oceans economically. The consensus in the scientific community, however, is that that day — when desalination on a large scale will be practical — is a long way off.

Until that day comes the most viable alternative, in my judgment, is to concentrate on making do with what we have, which means we must:

- **Stop wasting water.**
- **Stop polluting it so we don't have to spend so much time and money repurifying it.**
- **And learn how to use it and reuse it, over and over again.**

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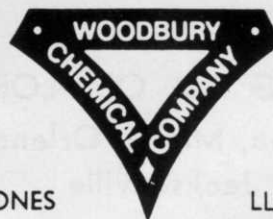
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I'm not going to take your time to suggest ways to reduce waste in our personal use of water. Nor am I going to discuss the importance of reducing the number and variety of pollutants introduced into our fresh water supplies. Others are doing that quite effectively.

I would, however, like to suggest that since agriculture accounts for approximately 80 percent of water consumption in the U.S. today, it is an obvious place to look for opportunities to improve water use efficiency.

Historic practice in farm irrigation has been to apply water in large amounts relatively infrequently. This not only wastes enormous amounts of water but, if continued over time, can reduce the productivity of the land. Modern equipment makes it possible to control the application of water so that the total amount needed to produce a crop and to protect the productive potential of the soil is much less on a seasonal basis, resulting in conservation of both water and soil and reduced consumption of energy.

Another very important method of water conservation is recycling. It is my personal belief that that approach is one of the most effective ways we have for expanding the availability of our finite water resources to meet the growing needs for sustenance and economic sufficiency of a growing world population.

There exists today the expertise and the technology to take wastewater from virtually any source — municipal, commercial, industrial, or agriculture — purify it and use it again for any purpose: to swim in it, bathe in it, even drink it.

The most common use of recycled wastewater in this country today is for irrigation — especially on golf courses.

When wastewater is used for irrigation:

- **The cost of treatment is reduced. Tertiary, or third-stage treatment, now required for effluent discharged into receiving waters, becomes unnecessary.**
- **The soil provides the third-stage treatment and returns the wastewater — thoroughly cleansed — back into the watertable.**
- **In the process nutrients in the effluent fertilize the turf and other vegetation supported by this on-land disposal site.**
- **And the amount of "used" potable water discharged into the oceans is significantly reduced.**

There are more than 30 golf courses that are irrigated with wastewater in California. Others are in Arizona, Florida, Colorado, Texas, New Mexico, Nevada and several other states.

Probably the first course to use waste-water for irrigation was Sharp Park Golf Course near San Francisco, which used treated effluent from the San Francisco County Jail in San Bruno, beginning in 1932, when the jail was built.

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One of the finest effluent irrigation systems is at the Air Force Academy in Colorado Springs. Every drop of effluent generated at the Academy is recycled to irrigate the Eisenhower Golf Courses, the cemetery, parade grounds and roadsides.

As with everything in our complex world, there are some pitfalls associated with recycled effluent. It must be properly managed. That's a small price to pay for the advantages gained, the most important of which is the conservation of a priceless indispensable, very limited resource.

All of us can help by treating that resource with the respect it deserves.

We can stop wasting it and stop polluting it unnecessarily.

We can urge those government authorities that manage our treatment plants to recycle the effluent — at least a few times before it is dumped into the oceans.

While I am not a proponent of more government regulation, I do believe there are some instances where a properly informed higher authority must oversee the protection of limited resources and resolve jurisdictional disputes.

If you are in a business where process water is used in large amounts, keep in mind that it can be cleansed and re-used, disposed of on-land to provide irrigation for recreational turf and other vegetation, stored for fire protection or utilized in many other beneficial applications.

Whenever there is talk of water invariably those famous lines from the Ancient Mariner are recalled: "Water, water everywhere, nor any drop to drink."

There is no large scale threat right now of anyone dying of thirst anywhere in the world that I know of. But I do feel that a false sense of plenty is inspired by the vast amounts of water that surround us.

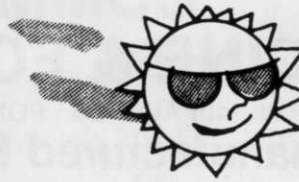
We look at the oceans and we see water. But it is not water that we can drink or use for irrigation.

It could well be that it is the appearance of plenty that deceives us into believing that our water supplies are more than adequate. Evidence to the contrary is abundant. We do not have access to sufficient quantities of fresh water to allow us to waste it and abuse it the way that we have.

We must treat it with respect. If we don't several other famous lines about water might become appropriate. Are you familiar with these words?

"Hold me up, mighty waters,
Keep my eye on things above."

They're from an Episcopal hymn that was played by the band of the Titanic as the ship was sinking.



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