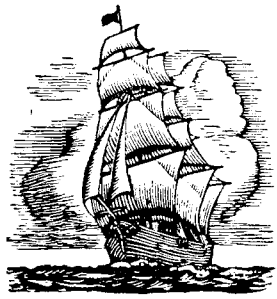


DESALTING SEA WATER

By Ross L. Holman

NOT LONG AGO a Pullman passenger, while looking out over a Western desert through which his train was speeding, remarked, "This is the most desolate, God-forsaken country I ever saw. It gives me an awful feeling to even ride over it."

"It isn't quite that bad," responded his seat companion. "All this region needs is plenty of water and good society."

"That's true," agreed the complainer, "but that's all that hell needs."

This train rider's comment is a forceful illustration of how much difference water makes in our existence. Many of us who do not even live in or near a desert are becoming increasingly aware of how right he was. During the past few years both the surface and underground water supplies of our country have been decreasing at an alarming rate. Many municipal reservoirs are drying up or getting low. Irrigated areas are going back into desert. Some of the most distressing days which most New Yorkers would like to forget were about four years ago when even bath and shave water became scarce. In some Eastern cities hotel managements during droughts have supplied water to their guests in buckets.

Our natural fresh water supplies have been dwindling because both domestic and industrial uses are increasing at a terrific rate. For example, one modern paper mill can use enough water to supply the ordinary municipal needs of a city of 500,000.

This ominous situation causes us to look with increasing expectancy to earth's last waterhole — the briny ocean. But that's the catch. In order to tap this vast pile of moisture, scientists have for years been trying to dream up cheaper methods of separating the ocean from its brine. Sea water contains 38,000 parts per million of salt plus a few other minerals, and it has been science's job to reduce the brine down to 500 parts per million to make it as fresh and drinkable as natural fresh water.

And it has succeeded far beyond anything that many of us had dared hope. In fact, engineers have found more ways to desalt ocean water than they have found ways to pay for it. They have found six processing methods that are actually working and seven more that look promising. But the chief problem has been to get the cost down to where the purified product can compete with the natural fresh liquid in every human use. Especially for irrigation and municipal water supplies. The U.S. Department of Interior and a few corporations think they are finding the answer, and if they are right it will almost revolutionize vast areas of our world.

One of the processes has already been a godsend to arid sections, where it is much cheaper to demineralize sea water than to ship in fresh drinking water for human consumption. The compression distillation method, which involves the use of stills, purifies from 1,000 to 50,000 gallons of water a day per still, depending on size. This method uses a sort of steam process that evaporates the water into steam and condenses it back into water. It was developed by the Arthur D. Little Company, of Cambridge, Mass.

A number of distillation methods have been used and they are providing drinking water for many arid areas where we have Government bases, weather stations, and other places where hauled-in water would be more costly. Distillation has been a happy solution in desert oil developments, such as in Arabia.

The Kuwait Oil Company has in operation on the Persian Gulf a sea-water evaporation plant that produces 720,000 gallons of drinking water a day. Before this plant was installed, the company had to haul its water by tanker from a place 90 miles away.

Compression distillation furnished drinking water to over a million service men in dry combat areas during World War II. It made an important contribution toward winning the victory over the Japs on barren Iwo Jima.

Now, as important as these developments have been, scientists are working desperately to give the processing of sea water something more than a distress value. It costs approximately 25 cents per thousand gallons to deliver natural fresh water to the average kitchen sink. In order to compete with present irrigation costs, desalted ocean water will have to be delivered to our dry land areas at prices ranging from 10 to 20 cents per thousand gallons. Reaching out for these price goals scientists are now seeing visions and dreaming dreams of making great hunks of desert blossom as the rose, only it will be done the sea water way. With such an unlimited supply for earth's dry areas, we will run out of desert long before we run out of water.

With plenty of artificial wetness,

Sahara may well become a rich farm area and Death Valley may be selling by the front foot. Yes, water can make a whale of a lot of difference and human society usually follows the water line. Just look what happened after Grand Coulee and Hoover Dam and multiply that by all the arid acres in the world. It may sound fantastic, but we can dream, can't we?

DESALTING costs have been decreasing at such an encouraging rate it doesn't follow that we have been dreaming in vain. One Southern company believes that under the distillation method it can recondition sea water at a cost of 50 cents per thousand gallons compared with an average 25 cents for delivering natural fresh. During the past few months the Badger Company, of Cambridge, Massachusetts has come out with another type of compression distillation equipment. It involves creating a turbulence in water at the boiling point, producing steam without as much energy as is normally required. While this is still in the laboratory stage, Badger thinks it can reduce the cost from 30 to 40 cents. However, because of so many variables, these costs are not easily comparable with the average 25-cent-per-thousand-gallon cost of natural fresh water. But they do provide a loose basis upon which to do our dreaming.

While compression distillation has been making such gratifying progress, a new corporation believes it can cut the desalting cost to the lowest figure yet by an entirely different process. Ionics, Inc. of Boston, announces a method of regenerating ocean water at a cost of 10 to 20 cents a thousand gallons. Working with scientists from Harvard and Massachusetts Institute of Technology, Ionics has a process that involves the pumping of sea water through a thin membrane. Two-thirds of the filtered product is pure water and one-third of it is brine. The one-third brine portion is expected to be found useful for a cheaper processing of potassium needed in fertilizer, bromine and magnesium, all of which are already being commercially manufactured from sea water.

Dr. Edwin Gilliland, President of Ionics, and Dr. Walter Juda, head of the group that developed the purifying method, are enthusiastic about the competitive possibilities for irrigation and municipal supplies. "In our Western states," says Dr. Juda, "as much as 10 cents a thousand gallons is paid for fresh water for ordinary industrial purposes.

"For irrigation, up to 29 cents is paid for water where there is a high and valuable yield per acre, and we've been told as high as $7 to $8 a thousand gallons is paid for drinking water in areas of extreme aridity."

The synthetic membranes through which the salty water is pumped

are made of low-cost coal, tar and petroleum products. In the process electric current separates salts from the water by the use of "ion-exchanges," a principle that has already been used for a long time in the softening of hard water. The details of the method are a defense and a trade secret.

While the processing costs given by Ionics sound encouragingly competitive, there are still a number of "if's" that will have to be ironed out before anyone can safely compare them with prevailing irrigation expense. The process will have to emerge completely out of the laboratory stage, and plants and equipment for large scale operation will have to be built before one can arrive at a more intelligent basis for evaluating its possibilities.

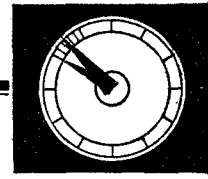
It is generally believed that the Ionics method will find its first and most profitable use in purifying the brackish waters of many arid regions. These waters contain from 885 to 10,000 parts per million of salt compared with 38,000 per million of sea water. One authority estimates that with electricity at 3 mills, brackish water can be purified for 1 cent to 12 cents per thousand gallons, depending on salt content. This may prove a boon to such brackish areas as Arizona, South Dakota and many Great Plains localities.

While compression distillation and ion-exchange are now the most promising prospects for commercially tapping the 320,000,000 cubic miles of ocean water, there are many other processes under development. It is entirely possible for some dark-horse method to come in and steal the show. At any rate, the very multiplicity of methods is one of the best assurances that some process will eventually solve the problem.

Among the other methods now under study through the Interior Department and other agencies are: solar evaporation, multiple effect evaporation, pressure and heat, and thermal difference. These are not all the approaches by any means, as others with more or less promise are under experiment. All these processes involve technical details that I do not have space to cover here.

However, at the moment, ion-exchange and compression distillation are the two methods that seem most likely to get the first large scale commercial application. Whether they will meet the need remains a matter of anxious speculation until that happens. There are many noted authorities who feel that these two solutions are already cheaper than the storage dams we have been building for the same needs.

They even say that if these processes had been developed at the time, there would have been no need for the 200-mile Owens River Aqueduct that supplies much of the water for Southern California.



It's Eleven O'Clock in the FAR EAST

By Harold Lord Varney

THE COLD, dank odor of appeasement is in the air. All the premonitory signs of an approaching collapse before Communism are building up in the Far East picture.

Washington won't admit it, but the Cold War, for the Far East, is definitely over. The stage is being set for another American strategic retreat. Although the Communist hate-drive which led to the sentencing of the 13 American fliers and civilians will make it harder for the Washington appeasers to maneuver their deal, and may delay the timetable for a few months, the end result is certain.

It is certain because the Eisenhower Administration is repeating the same befuddled policy which made such a shambles of the Acheson-Truman years — the policy of letting Great Britain (and its ally, Nehru's India) exercise veto power over American action in Asia. And since British and American interests in East Asia are diametrically opposed, the Eisenhower subordination to Downing Street in the Far East is a policy of diplomatic suicide.

The American people expected something better than this from President Eisenhower. Much of his spectacular victory in 1952 derived from the trustful belief of the American voters that he would sweep with a new broom in the Orient. The political revolt in 1952 was a revolt against Achesonism and Jessupism; it was a revolt against the betrayal