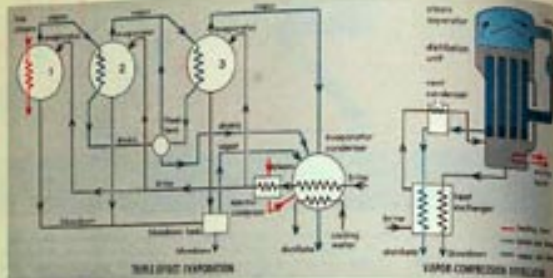


Mezinárodní výstava hraček a učebních pomůcek



15. II. - 16. III.

Umělecko-průmyslové museum v Praze • všední dny 9-17 hod. • neděle 10-13 hod. • vstup volný



We dream of great new supplies...from the ocean

Whenever large scale water shortages threaten, inventors swoop to advance the using totally new sources. Many are technically sound, but founder on the rock of cost. To be practical for general use, such schemes must produce water at a cost not too far from today's industrial average of 10 to 12¢ per 1000 gallons.

Distilled sea water has long been dreamed of as an ideal answer for coastal-area shortages. World War II developments in distillation and demineralization seemed to bring these dreams to reality.

Distillation Processes. In the familiar single-effect evaporator, sea water is heated. The salt-free vapor coming off is condensed as distilled water. In multiple-effect designs, the condenser of the first stage becomes the boiler of the second, and so on (diagram above).

Increasing number of effects reduces fuel needs per gallon of pure water but increases plant cost. Triple-effect evaporators widely used in process work show fuel cost of about \$1.00 per 2000 gallons.*

The newer and more efficient vapor-compression distillation units use the heat-pump principle (diagram). Present best yields run between 175 and 200 lb of distilled water per hr of fuel (retainer of power input). Fuel costs range up in the order of 30¢ for the 1000 gallons total cost about \$1.25.

These figures make fuel-distilled water more than 18 times as costly as softened Colorado River water delivered to Southern California. And so far as economy can be shown, large-scale plants won't reduce their fuel needs more than half. Availability of waste heat from nearby reactors might make a difference, but it's too early to assess comparative economics.

Solar distillation—by which nature gives us pure rain from ocean water—has been proposed. An 1800 solar still in Chile worked 9 sq ft of surface to yield one gallon per day. Latest MIT tests, in a tropical

*This cost value per gallon has "Quality of Water" by W. H. Adams, McGraw-Hill, Publishers, Inc., August, 1952.

setting, got by with 4 sq ft, but in the U.S. district would be needed. To match the 1000 miles plus per day (mgt) of the Colorado River Aqueduct require 215 sq mi of solar pans.

Cost and complication make chances of large perature difference between discharged ocean water and the ocean (Claude cycle) seem slim.

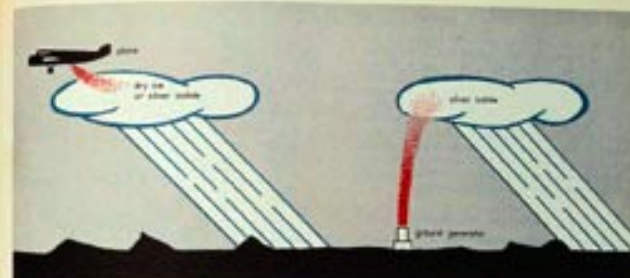
Ion Exchange. Synthetic amines and other chemicals can now produce demineralized water just the best distilled in the laboratory. Ion exchange units wide use in process industries but on salinity of water to be treated. High solids content of sea water (31,500 to 36,000 parts per million) totally requires heavy use of regenerating brines and wash water, puts costs out of all general applications.

Purifying sea water by electrolysis is little yield (less than one-third of sea water) and high power consumption.

Recent announcements describe use of a special plastic membrane in an electrical field. Membrane divides sea water into two streams of water (two-thirds of liquid) and seawater (one-third). Low costs are claimed for the process but few details have been disclosed.

Cloud Seeding. Turning to a completely different source, modern "rainmakers" seek to increase rain by making clouds precipitate. The trick lies in producing drop-forming particles (condensation nuclei) of exactly right size into clouds at the right temperature and ready to make rain.

Early trials seeded clouds by plane, particle dry ice or silver iodide. This method is still used but in western states, where rainmaking is the commercial contract, ground generators are preferred. These burn color impregnated with silver iodide. A blower sends up combination particles in a stream of particles at the rate of 30 quadrillion per



...from the clouds... even from our own wastes



There's no longer doubt that properly handled sewage makes rain, but argument still rages as to whether it increases total rainfall or merely causes rain to fall in one place instead of another. Knottest problems we face—suits have been brought for damage from increased rain and for depriving nearby areas of rain they might have had. Whether such legal hurdles can be cleared remains to be seen.

Practical Answer. A very real source of untapped water lies, almost literally, in our backyards—sewage effluent. A major part of all water used in cities goes to flush sewage. Proper treatment can make this water usable for many purposes, even potable.

Psychological reasons make it unlikely that sewage water can be recovered for public use on a large scale—at least until water needs are vastly more desperate than they are now.

But such limitations needn't apply to many indus-

trial uses. A growing number of plants treat their own wastes and recover water (often other valuable materials as well). And there are outstanding examples of industries using municipal sewage water.

Bethlehem Steel Co takes an average of 48 mgd of treated sewage from Baltimore for its Sparrows Point plant. It pays \$1500 per month for flows up to 25 mgd, \$1500 for 25 to 37.5 and \$2000 for 37.5 to 50.

Baltimore's Back River sewage plant has 20 mgd of activated-sludge capacity and 30 acres of low-rate trickling filters (220 mgd). Bethlehem takes up to 30 mgd of this plant's effluent and passes it, where necessary, through its own treatment facilities on the city-owned site. Water then goes through 7½ miles of 30-in. reinforced-concrete pipe to a reservoir for distribution in the Sparrows Point plant.

Within the next few years, Bethlehem expects to take up to 150 mgd. The flow from a million people takes up to 150 mgd. The flow from a million people

Fletcher  8-way pallet



specifications

The Fletcher 8-way steel wire pallet is of standard construction throughout. The top layer is composed of No. 12 gauge high tensile steel wire welded together in the usual manner. The wire on the four edges is of the 1/2 inch extra strength. The wire supporting legs are formed from No. 12 gauge wire twisted in the top from 200 inches from the edge center to the center line. There are six twisted longitudinal legs every 16 1/2 inches apart. The legs are 2 1/2 inches high and are spaced to allow the entry of forked trucks from any side or diagonal.

	Standard	Extra
width	48" x 48"	48" x 48"
height	22" x 22"	22" x 22"

Fletcher steel wire pallets

the  8-way pallet

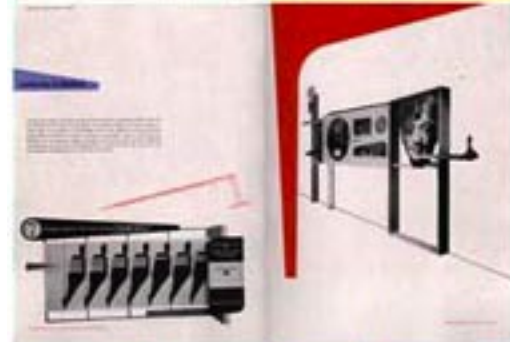


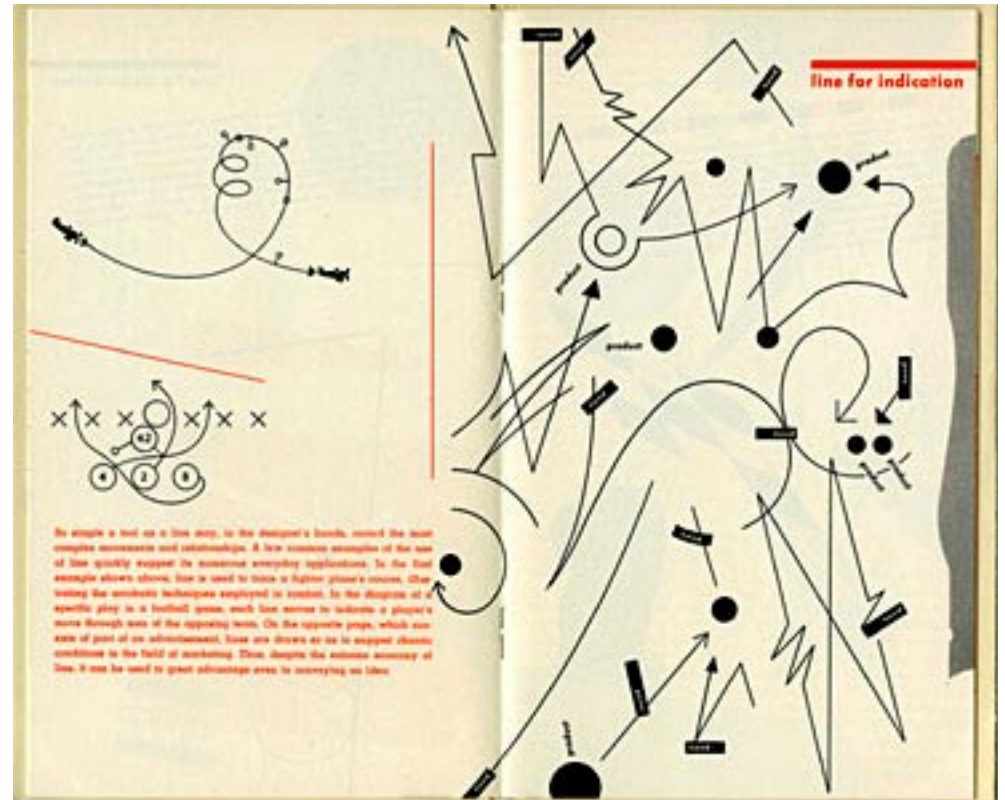
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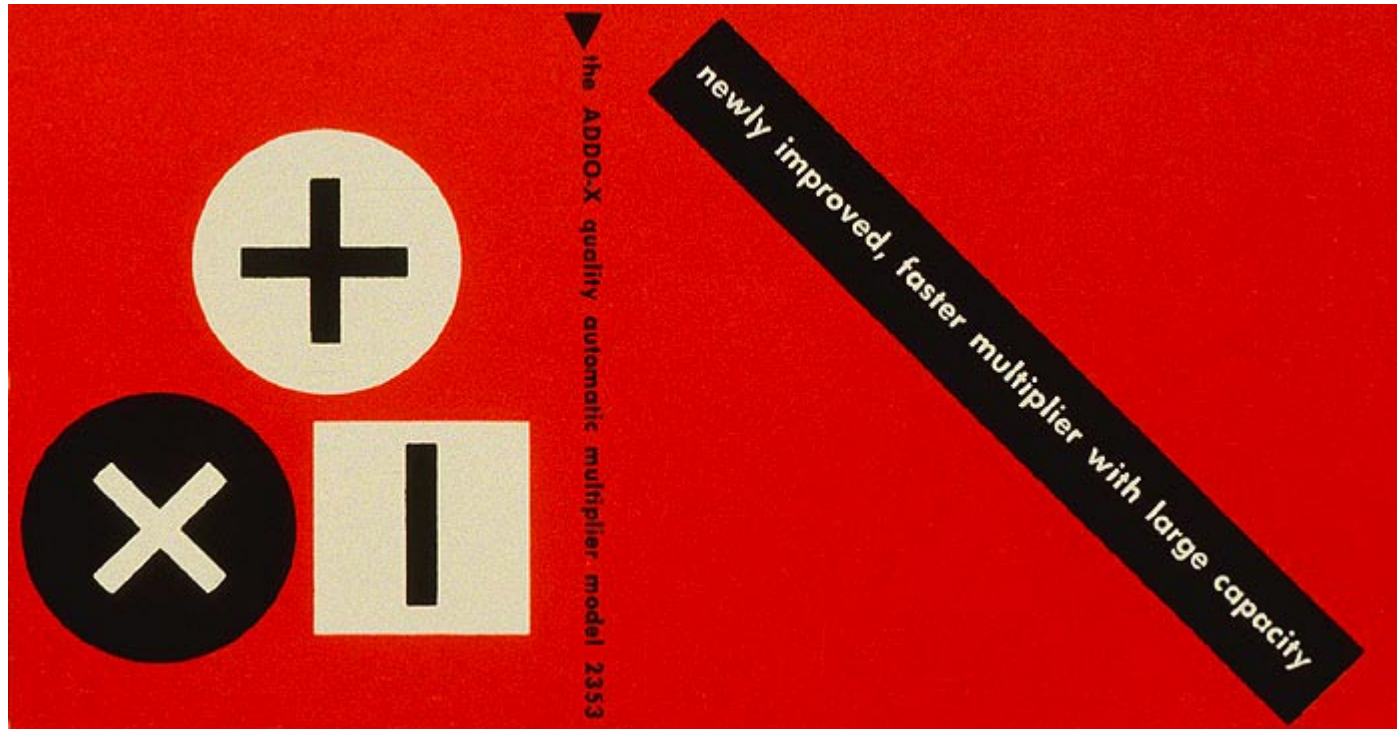












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