CHEMISTRY

Israel to Use Salt Water

➤ ISRAEL is speeding up attempts to make fresh water from salt water, it was announced at the American Chemical Society meeting in St. Louis.

All recoverable fresh water sources in Israel will be used up in a few years, Dr. Kurt Spiegler, Israel Institute of Technology, said. The only present sources are a few rivers, and underground pumping. Too much pumping in one spot, however, eventually yields salt water. The only real solution to the problem is salt water conversion, he said.

Development has centered on two methods, electrical methods and freezing evaporation. The electrical method is especially suited to Israel's problems since the cost depends entirely on the amount of salt in the water.

Since the most abundant source of salt water is from 10 to 100 feet under the ground and contains less salt than ordinary sea water, the cost would be less. The electrical process can also be carried out on a small scale. In fact, household units will be for sale soon, Dr. Spiegler predicted.

Cost is still the primary factor in saline water conversion, Dr. Spiegler continued. It varies from one to two dollars per thousand gallons of water depending on economic factors. There have been lower estimates and an effort is being made now to bring the price down to 50 cents or lower.

Cost is high because much energy is wasted in the process. The energy used is from 10 to 100 times more than the theoretical minimum needed, Dr. Spiegler said.

The use of atomic energy as the source of heat for saline water conversion is especially suited to Israel, where fuel supplies are low, Dr. Spiegler concluded. Further research, using low temperature reactors is required, he added.

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Inherited Protein

➤ BIRDS THAT FLOCK together are not necessarily of the same feather, scientists were told at the American Chemical Society meeting in St. Louis.

Chemical methods to measure inherited and distinctive protein fingerprints stamped in bird eggs have revealed family tree relationships of some 1,500 of the 8,500 known bird species, Dr. Charles G. Sibley, Cornell University, Ithaca, N.Y., reported.

Even though commen park pigeons are similar in size, shape and color, some of them have roots in the old world while others are native to this country, Dr. Sibley said. It has also been shown that certain "warblers," orioles and finches have a common ancestor, and that falcons—despite the similarity to hawks—are not truly birds of prey.

Protein structures are genetically determined, so that their study can give a developmental history of the species, Dr. Sibley said.

Such protein evidence is especially effective in revealing examples of "convergent evolution," that is, two animals coming to look very similar because of identical adaptations to the same or similar environments, Dr. Sibley continued.

"As better methods for the measurement of properties resulting from the sequential structure of protein molecules are developed, it should be possible to resolve many currently insoluble problems in evolutionary biology," Dr. Sibley concluded.

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Sex Hormones Analyzed

➤ A SEPARATION TECHNIQUE has been developed to analyze sex hormones in minute amounts, the American Chemical Society was told in St. Louis.

The sex hormones that control our mental and physical health occur in extremely tiny quantities in the body, Dr. Edward C. Jennings Jr., Wilkens Instrument and Research, Walnut Creek, Calif., said. In order to study the physiological function of the hormones, they must be isolated from biological sources, made extremely pure and then used on test animals. Gas chromatography has been used to obtain greater purity, Dr. Jennings said.

A gas chromatograph is an instrument that separates one compound from the other and records the relative amounts of each species. A special chromatograph has been designed to detect and analyze samples as small as one thousandth of a microgram.

The hormones being separated are so sensitive that even a slight change in temperature might cause them to rearrange or change in composition. However, no chemical changes take place within the instrument, Dr. Jennings said.

Female sex hormones, or estrogens, are especially hard to detect by this process, Dr. Jennings said, since they are highly reactive compounds. The male hormones, androgens, are much easier to work with.

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Fungicide Promising

➤ AN EXPERIMENTAL SEED and soil fungicide that shows promise on cotton, field corn, peanuts and vegetable seed was described at the American Chemical Society meeting in St. Louis.

The fungicide can control an unusually broad spectrum of soil-borne diseases in addition to a wide selection of viruses causing seed decay, Dr. William Diveley, Hercules Powder Company, Wilmington, Del., said. It also appears to have a low order of toxicity to mammals.

In a cotton seed experiment the newly developed fungicide was somewhat more effective than standard fungicides for control of a disease called pre-emergence damping off. The fungicide is a chemical based on cumene, which is in plentiful supply, Dr. Diveley said.

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Paint for Submarines

➤ WATER-THINNED latex paints will be used for the interior of nuclear submarines, the American Chemical Society meeting was told in St. Louis.

Conventional paints used on the interior of a submarine release poisonous substances long after application, Donald E. Field of the U. S. Naval Research Laboratory in Washington, D. C., said. Since nuclear submarines are underwater for prolonged periods, these contaminations are dangerous. An acrylic latex paint, developed at the Naval Research Laboratory, is free from air pollutants that would seriously cut down the time a submarine could spend underwater.

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Drugs Relax Muscles

➤ TWO COMPOUNDS that are not only good for relaxing muscles but act as sedatives and induce sleep were reported to the American Chemical Society in St. Louis.

Drs. Donald E. Heitmeier, A. P. Gray and Ernest E. Spinner of Irwin, Neisler and Co., Decatur, Ill., said these compounds, derived from the chemical pyrimidine, are five times as potent as mephenesin, a well-known relaxant. They have not been clinically tested yet.

These compounds have the jaw-breaking names of 2-(beta-hydroxyphenethylamino)-pyrimidine, and 2-(beta-hydroxy-beta-diphenylethylamino)-pyrimidine.

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GEOPHYSICS

Find Arctic Ice Controlled By Climate Cycles

➤ ARCTIC ICE is controlled by definite climatic changes occurring every seven, eight and nine years, Russian scientific studies have shown.

The amount of ice covering the Arctic waters could be predicted several years in advance with this method, the Russians claim.

"If true, this discovery would be a major breakthrough in polar research," Dr. Walter I. Wittmann, U.S. Navy oceanographic expert, said. It would shed new light on the ever-changing weather, and also influence future military strategy.

The strong link between the polar region and the land climates of the United States and Eurasia would be better understood, along with the military use of submarines underneath the covering mantle of ice.

The Russian studies were conducted near the ice-imprisoned New Siberian Islands off the Russian coast. They were reported in translation by the U.S. Joint Publications Research Service, Washington, D. C.

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