

AGRICULTURE

# JVA To Renew Palestine Land

**Jordan Valley Authority proposed to trade salt water for fresh through a canal to the dry coastal plain where it will be used for irrigation.**

By DR. FRANK THONE

► DIVIDED Palestine can still offer a fair prosperity to both Jew and Arab, each working his own garden separately. But a united Palestine, with Jew and Arab working together to make the most of the land's resources, could provide a living level so high that both would wonder why they ever quarreled.

So declares Dr. Walter C. Lowdermilk, until lately assistant chief of the U. S. Soil Conservation Commission, and world authority on the redemption and resettlement of lost and wasted lands. Leading exponent of the boldly conceived project known as the JVA (for Jordan Valley Authority), he points out that although cooperation between the seemingly irreconcilable disputants is needed for its full realization, there are parts that can be operated as independent units, until the time comes when they can be fitted as integral links into the completed chain.

## Profitable Undertaking

Basic idea of the JVA is a proposal to trade salt water for fresh—with a profit on both sides of the bargain. That kind of a deal should attract anyone with a sharp eye for business, be he Arab or Jew—or even Yankee. It may sound as fantastic as something out of the Arabian Nights Tales, but it is a perfectly practical modern engineering project. It has been declared financially feasible, too, by hardheaded bankers—able to retire the required capital investment of a quarter-billion dollars in 50 years, paying three percent interest the while.

The big trade, as proposed in the JVA project, is to divert a considerable part of the fresh water from the north, that now finds its way uselessly to the Dead Sea by way of the River Jordan, through a canal out to the dry coastal plain, there to be used for irrigation. To maintain the Dead Sea at its present level, a second canal will carry water from the Mediterranean into the Jordan valley, then follow a course parallel to the river until it empties into that great lake of concentrated brine. Since the Dead Sea is 1,300 feet lower than the Medi-

terranean, the plan is to build two great hydroelectric plants. Further revenues are expected from chemicals extracted from strong brine of the Dead Sea, especially magnesium, potash, iodine and bromine.

It is easier to understand Palestine by comparing it with southern California. Dr. Lowdermilk, and other scientists as well, have called attention to the striking resemblances between the two regions, in both geography and climate.

The basic pattern of both is the same: a rather dry coastal plain that runs up to a fairly high ridge, dropping off on the other side into an interior valley that at its southern end dips below sea level. Mountains to the north catch rain and snow, and make possible highly developed irrigation systems. This contrasts sharply with the extreme desert conditions that prevail in the deep southern valleys.

Parallels are not absolute, of course. Palestine has a big advantage in its underlying rocky structure. This is mainly limestone, which is honeycombed with caves and underground watercourses. These emerge as numerous springs, which help mightily in local irrigation works. Southern California's rock foundation is primarily granitic, which does not dissolve into water-carrying cavities as limestone does.

## Centuries of Soil Abuse

Offsetting this disadvantage, southern California has newer, hence deeper and more fertile soils. The soils of Palestine have taken centuries of abuse, especially from nomadic tribes who in the past centuries have broken in, ruined the old balanced agricultural economy of the land, and provoked heavy soil erosion by overloading the hills with grazing flocks, particularly of goats. Dr. Lowdermilk estimates that since the Arabs brought their goats to those hills some 1,300 years ago, three feet of good soil has been washed off the hillsides. Upland slopes are left as bare rock; bottomlands are choked into malarial swamps with the silt. So there is plenty for modern agriculture and engineering to do.

You can even find a climatic "double"

in Palestine for most of the well-known places in southern California. Tel Aviv, on the coast, is the Los Angeles of the Middle East. Jericho, which is near the Dead Sea, has a climate like that of Palm Springs. Beersheba, southernmost Palestinian city, is the climatic analog of Riverside, while Tiberias, metropolis of present-day Galilee, has its California equivalent in San Bernardino.

There is much similarity in the crops of the two regions. The Biblical trilogy of abundance—corn, and oil, and wine—are California crops, too: barley and wheat are "corn," oil comes from olives, and vineyards were in Palestine even before the Children of Israel first came into the land. In modern Palestine as in California, citrus-fruit raising has become a major industry.

## Need To End Present Strife

The great trade, of salt water for fresh, will become a reality only after Arabian-Jewish cooperation replaces the present condition of virtual civil war. However, even when that happier time comes, the entire scheme will not be put into operation at once; development has been planned for eight stages. And, fortunately, some of those stages can be started without waiting for the rest.

A beginning can be made, for example, at the northern end of the country, where the streams that eventually feed Lake Tiberias (the Biblical Sea of Galilee) come down from rainy Mt. Hermon and collect in swampy-shored Lake Huleh. The swamps can be drained and the waters channeled for irrigation farther downstream. About 37,000 acres of fertile land can be reclaimed for cultivation in this area alone. It should be possible to develop a good deal of water power in this short distance, for Lake Huleh is 230 feet above sea level and Lake Tiberias 700 feet below it. Since the entire Huleh district is included in the Jewish part of the new Palestinian state, much can be done here without waiting for Arab cooperation.

In Palestine there are some 40 of those desert watercourses known in the Arabic-speaking world as wadis; they would be called arroyos or gulches in our own West. Normally dry or at most carrying only a trickle of water, they occasionally catch a cloudburst and pour out destructive floods. The JVA project calls for putting dams across most of these and saving the storm waters that are now



**DIVERTING EARTH'S WATERS**  
—A salt-water canal will route Mediterranean water into the Dead Sea, to replace fresh water from the Jordan river system, diverted for irrigation purposes through a second great canal. This picture shows fresh water being run onto salt flats near the Dead Sea to leach out the minerals and make the land suitable for cultivation.

worse than wasted. While the eventual aim is to have all these tamed wadis fit into the unified irrigation and water-power system, obviously they can be taken in hand one by one, by either Jews or Arabs, according to whose land they lie in.

A good deal of water is expected to be obtained by tapping the underground drainage system with wells. These also can be dug and operated separately; though it is true that power for pumping will be much cheaper when the major hydroelectric plants that depend on joint action by Arabs and Jews can be built.

These partial operations are not mere salvage of scraps. They represent a really respectable fraction of the total new acreage which it is hoped will eventually be brought under irrigation. The final figure is expected to be somewhere in the neighborhood of 750,000 acres. The partial reclamations which can be carried out by the Jews alone will amount to at least 340,000 acres, mostly in the now arid coastal plain. The Arabs can reclaim about 100,000 acres without Jewish help. Moreover, declares Dr. Lowdermilk, this new land can be added within

two years if work is started promptly.

Even for the full realization of the JVA project, some time will have to be spent in research on some of the unique problems involved in the handling of the great volume of sea water to be channeled from the Mediterranean into the Dead Sea. All hydroelectric plants now in existence are run by fresh water. What kind of metals, and what type of turbine, will be needed for the great power plants? There is a challenge to metallurgists and engineers alike.

Palestine, like all the Near and Middle East, is a land where earthquakes sometimes happen just as they do in Calif-

ornia. Some very careful planning and experimental work will be needed to protect the large-scale engineering structures that will eventually be built. Here is a big job for the new profession of geophysics.

These are only a couple of the problems which the JVA engineers and administrators will have to meet and master. There is every reason to expect that these problems will be solved, and that twentieth century science will do much to make Palestine, for Jew and Arab alike, once more a land of milk and honey.

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#### CHEMISTRY

## Fuel from Natural Gas

➤ GARDEN CITY, KANS., will soon become a gasoline-producing center. This motor fuel and other petroleum products are to be manufactured there from natural gas, from the neighboring Hugoton Field, which is not desirable for ordinary uses because of its low heating qualities.

The manufacturing plant is to be built by Stanolind Oil and Gas Company of Tulsa, Okla. It is a multi-million-dollar project. It will include a plant to extract liquefiable hydrocarbons such as gasoline, butane and propane from the natural gas; a synthesis plant including an oxygen-production unit; a chemical refining unit; laboratories and other buildings. The gasoline and fuel oils produced will be marketed largely in the Kansas area. The chemicals produced will be distributed nationally by U. S. Chemicals, Inc.

The huge Hugoton Field of southwestern Kansas is claimed to be the largest gas field in the United States and to contain 23,000,000,000 cubic

feet of gas, part of which has low heating qualities. The new plant will process about 100,000,000 cubic feet of this gas daily, it is expected.

In the process, dry feed gas from the field is burned under 300 pounds pressure with relatively pure oxygen to yield synthesis gas from which the final products are made. This synthesis gas is largely carbon monoxide and hydrogen. With the help of an iron catalyst in a fluidized state, being finely powdered, it is converted into the petroleum hydrocarbons and water.

Another plant for making gasoline and other hydrocarbons from natural gas is under construction in Texas. It will use gas of real fuel value, it is understood, not the low-heating-value gas to be used in Kansas. The supply of natural gas in America is limited, of course, but there is enough to permit the manufacture of liquid fuels from it for the next 25 years without danger to the amount needed for gas lighting and heating.

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## Convert Waste into Fuel

➤ THOSE great heaps of waste anthracite silt near hard coal mines may soon be furnishing homes with fuel gas and automobile engines with liquid fuel, President Frank W. Earnest, Jr., of the Anthracite Institute, Wilkes-Barre, Pa., revealed.

A new process for converting the present waste into fuel will be tested in a pilot plant under construction by the Institute's research organization of which Dr. Raymond C. Johnson is in

charge. In the anthracite country there are an estimated 200,000,000 tons of this silt immediately available, and more is produced every year.

Anthracite silt, washed out of the coal after mining, is about as fine as granulated sugar. It is not suitable for burning in grates and has accumulated at mine heads for years. Its use to produce fuel gas and liquid fuels will in no way decrease the available supply of marketable coal.