

AGRICULTURE

Farming Returns to Negev

The discovery of a system of desert farming that was used successfully thousands of years ago holds great promise for agriculture throughout the arid zone regions of the world.

By **BENITA TALL**
From Beersheba, Israel

➤ THE DESERT is being farmed again.

Pomegranates and olive trees are being planted on land last farmed by the Byzantine farmers and their predecessors, the Nabateans, some 2,000 years ago. If the results show that fruit trees, grapes, and other farm crops can be grown where only three to five inches of rain fall each year, an important step will have been taken in conquering and controlling the desert.

About 28 miles south of Beersheba, on the road to Egypt across the Sinai peninsula, archaeologists have uncovered an ancient farm. A small group of researchers will live on this farm and plant the same crops and trees grown so long ago. In this way they will be able to study the desert under the actual living and farming conditions experienced by the Byzantines.

Prof. Michael Evenari, botany professor and vice president of Hebrew University in Jerusalem, plans to set up house with his wife in a 2,000-year-old farmstead near the site of the Nabatean city of Subeita. There his group, which includes water engineer Leslie Shennon, agriculturalist Naphtali Tadmore, archaeologist Dr. Y. Aharoni and Yossi Feldman, an amateur archaeologist, will use "home grown" water and study

the irrigation system that enabled the early farmers to grow crops successfully.

This irrigation system consisted of flood irrigation, terracing and cisterns for water storage.

Apparently well-developed agricultural projects, ranging in size from one acre to several hundred, were established in the flood plains and wadis. The slopes of the surrounding hillsides served as water collectors for producing irrigation water and also for extensive grazing, Prof. Evenari explained. Small round piles of stones and pebbles, spaced in rows along the hillsides, are believed to have directed the rain water down the slopes onto the fields.

The fields themselves were irrigated by a system of canals, spillways, drop structures and division boxes all made of stone. Some of the canals, Prof. Evenari said, were a mile long and several yards deep.

By opening and closing canals it was possible to control water flow so that it penetrated the soil slowly to a depth as great as four yards. At the Subeita farm there are some 16 alternate ways to direct the flood waters. Strong stone walls, built to last, prevented the rainwater from running off.

The farmhouse in which the Evenaris will live is believed to be typical of the farming developments that grew up in the desert near important cities. Five terraced acres have been reconstructed, while the

farmhouse, which is quite well-preserved, needs repairs. Lighting provided by wind-motor power will be one of the few concessions to modern living.

If their study is successful, Prof. Evenari believes there will be three important objectives achieved:

1. Scientists will have proved deserts can be farmed without bringing in costly irrigation water from the outside.

2. Waste rain water will be put to use, saving irrigation water.

3. Large areas of desert throughout the world can be developed and settled. Specifically the desert researchers expect to investigate problems, some of them never before studied systematically with care and accurate measurements, such as the desert rainfall patterns and characteristics and quantities and runoff rates from desert surfaces. Related problems include: ways to increase runoff rate; soil water and plant relationships in the desert; use of wind-breaks and drought-resistant trees in arid zones.

"There are theories for and against the feasibility of farming the Central Negev highlands without pipe line irrigation," Prof. Evenari said. "But this will be the first time that anyone has tried it out in actual practice."

The experiment is certainly worth making, he believes. Thousands of desert people throughout the world will be "watching" the experiment which promises so much for them.

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ENGINEERING

Plastic Artificial Moon Could Relay Radio Waves

➤ A PLASTIC artificial earth satellite could be used to relay radio and television waves around the world and help mariners chart their courses.

The sphere would be hurled 1,000 miles into space in a deflated state. Once there, a one-pound container of gas would inflate the sphere for its orbital journey, scientists at the Aviation Conference of The American Society of Mechanical Engineers learned.

The versatile moon would be covered with a thin film of vapor-deposited aluminum to make it visible on earth, provide a good reflecting surface, and protect it from prolonged exposure to the sun.

The sphere's prototype, reported George P. Wood and Arlen F. Carter, aeronautical research engineers at the National Aeronautics and Space Administration's Langley Research Center in Virginia, would be 100 feet wide and weigh about 100 pounds.

The engineers estimate that between ten kilowatts and ten megawatts should be enough power to shoot radar beams to the satellite.

The bright aluminum surface, they said, would make the proposed space outpost far brighter than all but two stars and four planets.

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DESERT FARMERS—Prof. and Mrs. Michael Evenari stand in a corner of the ruins of the ancient city of Subeita. Near this city evidence has been found of an elaborate system for desert farming.