

GENERAL SCIENCE

Land of Milk, Honey and Science

Israel, the fabled land of milk and honey, might better be known today as the land of science, for science is playing an important role in its history.

By BENITA TALL

► LAND OF THE Bible, fabled land of milk and honey, holy land for Christians, Jews and Moslems alike, a center of ancient civilizations and a center of tension in today's civilization—these are the terms in which we think of Israel today.

They each neglect an essential aspect of the modern nation Israel: science and technology.

When the nation was established 11 years ago in May, 1948, Dr. Chaim Weizmann, world-famous chemist and first president of Israel, explained that scientists would have to provide their nation with whatever nature had omitted. Resources of the human mind would have to compensate for water shortage, food shortage and, apparently, shortages in the basic materials essential to some degree of national self-sufficiency. The only abundance the new nation had a decade ago is the one it still has—people. However, the human mind is meeting the challenge presented to it.

Scientists are working on the water problem. Wells are being drilled, floods controlled and water brought to the desert. Enough food is being produced to feed the people. And raw materials such as rich phosphates and oil have been discovered. Where a raw material is lacking, wood for pulp to make paper, for example, the scientists and engineers have come up with a substitute.

Science for Today

Israel has had one great advantage in its scientific progress as a nation that must be mentioned. It could take immediate advantage of the elaborate technology and a wealth of scientific knowledge that exists in the world. Israel did not have to go through an industrial revolution or overcome an anti-science attitude of a government or people. It could and did learn from the technological growing-pains of other nations.

In considering the scientific progress Israel is making it is important to look at the country's geography and its economic status.

As a Middle Eastern country Israel has certain specific problems in agriculture, medicine, power for industry and in trade. Each new crop its scientists develop as suitable for cultivation in Israel could be considered throughout this area with its extremely limited agriculture. This means that Israel serves as a model for what science and technology can achieve in the Middle East.

As an underdeveloped country Israel also is a model for Africa and Asia in its scientific development. Its studies of industry

and heavy machinery, setting standards, education and the acquisition of a trained body of engineers, technicians and scientists are being watched and, in some cases, copied by other nations.

The establishment of national standards in foods, building materials and dozens of other consumer products is interesting for an "outsider" to observe.

In the United States we tend to accept these standards as absolute: All bricks in the world that have a certain specified composition of clay and are of a certain size are grade A. However, standards are not absolute. As Mr. Y. Ben-Sira of the Standards Institution of Israel pointed out, quality requirements and effective inspection systems have to be designed for the special needs of a country.

Thus Israeli grade A bricks will be different from American grade A bricks. Several factors enter into the fixing of these standards. Israeli workers, technicians, and engineers might not be able to meet American standards because of lack of training and experience or equipment, for example.



MODEL RIVER—The 16 miles of Yarkon River are reduced to a 225-foot scale model constructed on top of Mount Carmel at the David T. Siegel Hydraulics Laboratory of the Technion. Scientists are conducting tests in an effort to prevent the periodic floods which transform the river, normally a small stream, into a torrent that menaces life and property.

Materials are different. Environment is different—American grade A bricks might crack under the sub-tropical climate of some parts of Israel.

The fact that industry in Israel is young and rarely scientifically equipped to carry on its own testing and research program has also influenced the make-up and function of the Standards Institution. The Institution's laboratories test thousands of samples each month, checking compliance with standards and also contributing to consumer acceptance and confidence in a product.

Israeli standards are published, Mr. Ben-Sira said, and are gaining international recognition. Standards here are flexible, he explains. As research and testing improves they are revised upward. Again, as with science and technology generally, the new, underdeveloped nations are particularly interested in what Israel is doing in the field.

Water, or rather no water, is a serious problem throughout the arid zones of the world. The solution of this problem is occupying the time of many of Israel's scientists and engineers while the national Government spends large sums on research and development projects. In a very real sense the future of the nation depends on finding more water and controlling it. Recent estimations of the water resources have had to be revised downward, giving added urgency to the problem.

Needed: More Water

At the Technion, the Israel Institute of Technology, engineers are studying ways of bringing water where it is needed, drilling new wells, controlling floods and protecting the water supply.

One of the Technion's most ambitious projects is a "river" built on the Mount Carmel campus. It is a 225-foot model of the Yarkon River near Tel-Aviv. Each contour of the 16-mile river is carefully reproduced along with the topography of the surrounding land. By duplicating flooding conditions, the engineers expect to be able to more effectively control the river and thus save water as well as avoid losses to property and life. Flow from streams and tributaries can be measured, increased, decreased or stopped completely in miniature. Dams or re-channelling can also be studied before tackling the actual river.

The Technion together with the Weizmann Institute and the Hebrew University comprise the three main scientific and technological groups in Israel. Each exemplifies its "species" of institution.

The Weizmann Institute is the epitome of the pure science institution. In its modern, well-equipped laboratories scientists are working on the basic problems in biology, physics, chemistry, mathematics and the other sciences. Sometimes the results of their research may have application to a very real and immediate problem, such as

the cause of cancer. However, the emphasis is on research that will increase our knowledge and understanding.

At the Technion, as one professor explained, the engineers "do" cheaper and more efficiently what the scientists plan. At Technion City, the new campus being built on Mount Carmel, whole buildings are devoted to problems of sanitation, soil science, water research, building materials research. As a combination teaching-research institution, the Technion also must turn out engineers for the country, "do-ers" who can bring water to deserts, build cities on clay soils, make roads that will not buckle under torrential rains and baking sun, and find and dig for chemicals.

On the stony hills outside of Jerusalem there is a new Hebrew University.

Here the President of Israel teaches, a general of the army takes undergraduate courses. Everyone, it seems, studies, teaches and learns.

"Pure" or "Applied" Science

While it is representative of a teaching institution, the University also is typical of a problem confronting the underdeveloped nations. Currently there is what amounts to a national debate: How much emphasis should a nation such as Israel, with limited funds, etc., spend on pure research?

Many persons, including scientists, believe most of the scientists should be working on concrete problems, concentrating on directed research. This is the only way, these persons say, that the country will advance as quickly as possible.

Whichever aspect of science is stressed in the years to come, a visitor to Israel cannot help but feel that science is a vital part of the nation. There the engineer designing an aerial car to carry fruits down the rocky terraces in Galilee and the scientist studying the virus "blooming" in a tissue culture are equally important.

Science News Letter, April 18, 1959

Questions

ASTRONAUTICS—What is the minimum I.Q. of the seven astronauts? p. 243.

CHEMISTRY—What is pantothenic acid? p. 245.

How does nicotinamide affect DPN? p. 245.

GENETICS—What relation has been found between chromosome number and Mongoloid idiocy in humans? p. 247.

MEDICINE—Where does a new drug that protects against sunburn come from? p. 246.

Photographs: Cover, Fremont Davis; p. 243, National Aeronautics and Space Administration; p. 245, Chas. Pfizer & Co., Inc.; p. 250, Israel Institute of Technology; p. 256, Eastman Chemical Products, Inc.

AMAZING ELECTRONICS DISCOVERY!

Portable, Transistorized Tape Recorder Costs LESS Than Down Payment on Many Standard Recorders!



Here's the new, low-priced, battery-operated tape recorder you've been waiting for! Powered by ordinary flashlight batteries and transistors—a finely engineered instrument—not a toy! It is multi-staged utilizing transistors for superb tone clarity. Truly portable—weighs less than 2 lbs.

CAN SAVE YOU MANY TIMES ITS COST THE VERY FIRST TIME YOU USE IT!

You'll find a thousand and one uses for this amazing tape recorder. Use it as a dictating machine—to cut your office and home work in half. Use it to record sales meetings, interviews, group discussions, on the spot reactions wherever you go! Use it for wonderful new fun with your children and family—to store up memories that will never grow dim! It makes the perfect gift to give or get!

\$3750 Complete with Microphone-Listener, Private Listening Device, Sample Reel of Tape, Deluxe Fitted Attache Type, Simulated Leather Carrying Case, Set of Batteries.
FREE! Extra 225 ft. Reel of Recording Tape!

LET SOME OF AMERICA'S OUTSTANDING PRESTIGE MAGAZINES TELL YOU WHAT THEY THINK ABOUT IT!

American Legion—"While miniature tape recorders have been available for years, their price has kept them out of the mass market. Most of them sell for close to \$300, but now a machine is being sold for one-tenth of that!"

Scholastic Teacher—"Recording is quite audible and easily understandable. Fine for small student group, interviewing community leaders."

Cosmopolitan—"The Last Word! . . . Capture baby's first words or a memorable family occasion. Dictate letters, reports, speeches. You can even re-record phono discs and radio and TV shows!"

Mademoiselle—"Very happy to report that anyone can afford it—and anyone can operate it!"

Popular Mechanics—"Provides low cost, variable speed recording and playback."

V.F.W. Magazine—"Imagine a precision-made, battery-operated tape recorder that weighs only two pounds, yet sells for this amazing low price."

Send Check or Money Order. If COD—send \$3.00 deposit.

FILNOR PRODUCTS INC., Dept. M-76—101 W. 31st., New York 1, N. Y.



For science teacher demonstrations in different locations, any vantage point. Moves quickly. Equipped with gas, electric and water services, support rods and pegboard display panel. Roomy storage area. In attractive colors, large Formica top. Write for full details.

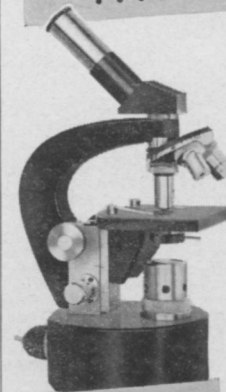


Cenco, the leading manufacturer of instruments for laboratories

CENTRAL SCIENTIFIC CO.
1718-V Irving Park Road • Chicago 13, Illinois
Branches and Warehouses—Mountainside, N. J.
Boston • Birmingham • Santa Clara • Los Angeles • Tulsa
Houston • Toronto • Montreal • Vancouver • Ottawa

EACH \$29500

UNITRON'S Model MSA makes teaching easier . . . learning faster!



Here is a teaching microscope with built-in features to aid the instructor and student, yet priced for school budgets.

- Inclined prismatic eyepiece rotates 360° permitting two students or teacher and student to share the instrument
- Built-in low-voltage illuminating system, fixed condensing lens . . . transformer conveniently housed in base . . . accessory mirror included . . . cabinet
- Substage condenser with aperture iris diaphragm assures correct and brilliant illumination at all powers . . . filter on swing-out mount
- All metal construction with durable black and chrome finish
- Low positioned coarse and fine focusing controls with protective stops to prevent damage to objectives or slides
- Three parfocal achromatic objectives 4X, 10X, 40X: professional quality with full numerical aperture . . . triple nosepiece . . . three eyepieces 5X, 10X, 15X . . . available magnifications—20X, 40X, 50X, 60X, 100X, 150X, 200X, 400X, 600X

\$107

Only F. O. B. Destination

In lots of 25 — only \$94.16 FREE 10-DAY TRIAL

UNITRON

INSTRUMENT DIVISION of UNITED SCIENTIFIC CO.
204-206 MILK STREET • BOSTON 9, MASS.

Please rush UNITRON's Microscope Catalog 5Q3.

Name _____
Company _____
Address _____
City _____ State _____