

ARCHAEOLOGY

Air Reconnaissance of Peace

Ruins Made by Ancient Conquerors of Iran Studied In Warring World by Aerial Photographic Mapping

By EMILY C. DAVIS

WHEN, in these days of blitzkrieg, an airplane flies over ruins it did not cause, that's news!

But while, in other parts of the world, bombing planes were unloading their destructive missiles to destroy great cities, scientists on a mission of peace have been using the same methods of aerial photography that R. A. F. and Luftwaffe reconnaissance planes employ, to study the work of ancient conquerors, who had far less efficient engines of destruction.

These flights have been made over Iran. (Most of us called it "Persia" when we went to school!) Air-minded American archaeologists have had this unusual privilege through the friendliness of the Iranian people.

As a result of very special arrangements, scientists from the University of Chicago's Oriental Institute have looked down on Cyrus the Great's capital and his empty tomb.

They have mapped the length of the Great Wall of Iran—did you know there was one?

They have surveyed from the air the strongholds of the terrible Old Man of the Mountains, made famous in Marco Polo's adventures.

They have photographed in documentary style, from above, palaces—beautiful even in ruin—of conquerors Darius and Xerxes, at Persepolis. Here is a city swept by fire in the wrath of another conqueror, Alexander the Great. These palaces in their full grandeur of sculptured stairways, terraces, gardens and halls may have been visited by the "fair and beautiful" Queen Esther of the Bible. The King Ahasuerus, whom she wed, is often identified as the Persian Xerxes.

Sharing interests with such memorable sites, and more intriguing to scientific curiosity, are humps and mounds of earth which mark ruined towns and cities, as yet unprobed. Many of these have been mapped and photographed by the flying archaeologists, and some day the most promising may be opened.

Even when these flights were arranged, back in the peacetime year of 1935, Iran looked upon foreign aviators one and all

with such wariness that the American scientists had to obtain permission from the Shah of Iran himself.

To emphasize that Iran was setting no precedent which might result in importing aircraft with less desirable aims than those of archaeological science, the Iranian General Staff stipulated that the archaeological plane, named the "Friend of Iran," remain in Iran when scientific flights ended.

First account of the flying explorations, which were carried out from 1935 to 1937, is now published. Dr. Erich F. Schmidt tells the tale in *Flights Over Ancient Cities of Iran* (Reviewed, SNL this week). His air photographs, surveys and observations will provide much help for groundling digging expeditions, when the world is peaceful enough to permit such work again.

Already, Dr. Schmidt's aerial archae-

ology has been put to use on the ground by more than one expedition.

Following clues obtained during aerial explorations, he himself has found a sanctuary and burials of the mysterious people responsible for the Luristan bronzes—exquisite art which came out of Iran a few years ago to stir the entire art world.

When Dr. Schmidt flew over ruins of Rayy, one of Islam's magnificent old cities, he made photographs which formed such excellent guide maps that his ground expedition which had been working on the ruins could have scrapped its expensive ground surveys. Had the "Friend of Iran" been available when this expedition started digging, both time and funds could have been saved—just one example of how aviation and photography aid the science of archaeology these days.

In fact, aviation partly answers the question, "Why were explorers handicapped in searching for man's past before our time?" Some of the walls, roads



SURVEY FOR SCIENCE

Cyrus the Great rested here, but not for long. His tomb at his capital city, Pasargadae, was plundered by another conqueror's soldiers when Alexander the Great marched in. Weeds grow among the stones of this Persian empire-builder's tomb, seen here in impressive ruin and isolation, from the air. All the photographs illustrating this article are from expeditions promoted by the Mary-Helen Warden Foundation, the Museum of Fine Arts, Boston, the University of Pennsylvania Museum, and the Oriental Institute of the University of Chicago.



"FRIEND OF IRAN"

This is what American archaeologists named their plane, which has enabled them to look down on ancient ruins in Iran, by special permission of the Shah himself. The airplane, shown here at a landing, remains in Iran, by stipulation of Iran's General Staff.

and ruins of man's buried civilizations have become entirely invisible—as walls, roads and ruins—to the people who walk over them. Once an archaeologist gets up into the air, plans of many such places and their most important structures are revealed.

The camera then does its share by recording the vanished cities in pictures which may be combined to form mosaic maps. A whole range of sciences—chemistry, engineering, anatomy, and many others—aid the re-discovery of the past. Aviation makes particularly spectacular feats possible.

Military flyers in the last war, Dr. Schmidt points out, helped the peaceable science of archaeology by noting ancient sites as they flew over Near Eastern countries. British, German and French flyers all spotted ruins of civilizations wrecked long before modern war's destruction.

What it is like to scout for this kind of ancient history can be shared second-hand by following Dr. Schmidt's flying experiences. At first, he says, he was often bewildered by the multitude of ground details displacing one another at great speed. But soon he learned to see faster, and to read and analyze the landscape below.

Flying over Iran he learned to tell—in certain cases by square shape and round corner towers—an Islamic ruin

(later than the seventh century of our era) from Iran's more remotely ancient ruins. In detective fashion, he learned to gauge expertly the antiquity of a buried city partly by its plan and partly by the degree to which its irregularities have been smoothed over and destroyed by time.

Recording the Great Wall of Iran kept the observer working at terrific speed, so many objects of archaeological importance seemed to flash beneath the plane. But many photographic records were made, and results of the explorations show that the Great Wall of Iran stretches considerably beyond limits which have been shown on the Survey Map of India. Dr. Schmidt followed the wall, he believes, to the end and he sighted 31 of its garrison forts.

More than 100 miles, this Iranian version of the Great Wall of China stretched defensively to shut out hordes of feuding nomads from the Siberian steppes. Which Persian ruler determined to block the recurrent invasions, is not yet known. Whoever he was, he did a great engineering job, building the wall with its forts all the way from the Caspian Sea in the west to the mountain barriers in the east.

A flying archaeologist in Iran can look down on results of many a conquest and invasion in the world's turbulent experience.

Dr. Schmidt made aerial photographs

NEW YORK TIMES:

"The place of this really fascinating book is in the family circle and the library of the inquisitive individual."

The Microscopic World

BY FRANK THONE

Illustrated with
many drawings and
photographs

THANKS TO this book you do not need to own a microscope to glimpse into the fascinating world of little living things. For Dr. Thone passes the micro-beasts before us in review and takes us through the micro-forests of bacteria, molds and algae, and helps us to understand where, how and why these things exist, what they mean to us, and how we know about them. Dr. Thone is biological editor for Science Service and *Science News Letter*. \$3.00.

JUST OUT!

H. M. PARSHLEY (in New York Herald Tribune "Books") says:

"It would be difficult to find a more suitable holiday gift for anyone suspected of biological leanings."

MAIL THIS COUPON TODAY!

RETAIL BOOK DEPT.,
SCIENCE NEWS LETTER
2101 Constitution Ave.,
Washington, D. C.

Send me.....copies of
THE MICROSCOPIC WORLD, by
Frank Thone, at \$3.00 per copy.

I enclose remittance Send C.O.D.

NAME.....

ADDRESS.....

CITY & STATE.....



DOWN TO EARTH

Dr. Schmidt uses his facts gained in air views in patient hours of digging out fragile relics of the past.

over Cyrus the Great's capital and tomb, because some day there may be further discoveries there. But there will be no finding of the Persian king himself in the pomp and splendor of an Egyptian Tutankhamen. Within 200 years of his death, Cyrus was routed out of his golden coffin and his tomb was plundered of regal possessions by an invading army. Soldiers of Alexander the Great, without Alexander's knowledge, looted the tomb of Cyrus.

It has been believed that the capital where Cyrus ruled as founder of the Persian Empire was mainly a governmental area, a place of palaces and parks with no continuous settlement of houses and shops. Air views now support this

belief, though Dr. Schmidt cautiously suggests that floods and farming might have flattened out any residential areas that existed, hiding them completely.

There still remain mounds of earth at Pasargadae—as the first Persian capital was called—which have not been probed at all. And the fortified area of the capital, the enclosure of which was first discovered from the air, offers attractive possibilities for learning more about one of the great rulers of long ago.

Persepolis, which became the capital of the Persian Empire under Darius, and which was first occupied and then wrecked in Alexander's world march, has within recent years been unearthed by an expedition working under the auspices of the Oriental Institute, Chi-

cago, the University Museum of Philadelphia and the Boston Museum of Fine Arts.

Much more about Persia's part in world history has been revealed as a result of such digging. The names of the nations of Xerxes' famed empire were found engraved on cornerstone tablets, and beautiful reliefs emerged from the debris of the palatial structures of Persepolis.

Genghis Khan's Mongols and Tamerlane the terrible are among invaders who have wrought destruction to Iran's beautiful cities. The city of Rayy, in its time the most sumptuous city in the world next to Baghdad, fell prey to both these conquering hordes.

Science News Letter, December 14, 1940

MEDICINE

Radium and X-Ray Treatment Advised for Brain Tumors

BRAIN tumors can be successfully and safely treated by large doses of radium or X-rays, Dr. Ira L. Kaplan, of Bellevue Hospital and New York University, reported to the Radiological Society of North America, meeting at Cleveland.

New knowledge of radiation treatment, Dr. Kaplan said, enables physicians to use larger, and therefore more effective, doses than they dared to use in the past when it was feared such doses might harm the brain tissue as well as destroying the tumor.

In most cases, he said, radiation treatment should follow surgical treatment, but in some cases irradiation alone produces the desired results.

Science News Letter, December 14, 1940

Shorten Legs of Cripples

THE crippling effects of infantile paralysis or other ailments which leave the patient with one leg shorter than the other can be overcome by X-ray treatments to shorten the longer leg, Dr. Davis Spangler, of Dallas, Texas, reported.

Success with such treatment of four patients from the Scottish Rite Hospital for Crippled Children was reported by Dr. Spangler.

The idea of the treatment is that short legs of nearly equal length are preferable to legs of unequal length. Various surgical methods of equalizing leg length have been tried. The X-ray treatment

acts, it was explained, by stopping bone growth. In the four cases reported Dr. Spangler said the X-ray treatments gave a more uniform result than surgical treatments, although the X-ray treatments took longer to accomplish the result.

Science News Letter, December 14, 1940

Soviet agriculturists report that cucumbers, radishes and lettuce are being grown in *northern areas* where the temperatures may drop to six below freezing Centigrade in July.

To provide a *clear road* for fast cars up and down a long hill near Nashville, Tenn., a separate lane of red concrete has been constructed for slow trucks climbing the grade.

Don't Delay

getting that **new book** you want to read. **SCIENCE NEWS LETTER** will gladly obtain for you any American book or magazine in print. Send check or money order covering regular retail price (\$5 if price is unknown, change to be returned) and we will pay postage in the United States. When publications are free, send 10c for handling. Address:

Book Department

SCIENCE NEWS LETTER

2101 Constitution Ave. Washington, D. C.

LANGUAGES
Made *easy* By
LINGUAPHONE

This amazing new Method enables you, *in your own home*, to speak and read any of 27 foreign languages in an incredibly short time. Endorsed by leading university professors and thousands of men and women as the quickest, simplest and most thorough language method. Send for **FREE** book.

LINGUAPHONE INSTITUTE
31 RCA Building New York City