ENGINEERING

Great Model Shows Engineers How to Prepare for Floods

U. S. Waterways Experiment Station at Vicksburg Condenses 602 Miles of Mississippi Into 1,100 Feet

See Front Cover

HIGH on the Vicksburg bluffs, overlooking the great, muddy inland sea that normally is the Mississippi River, stands the scientific laboratory that provides the nation's best information on flood control and prevention. It is the U.S. Waterways Experiment Station of the Corps of Engineers of the U.S. Army.

The Army engineers learn much, naturally, from a superflood like that which now laps at their very feet, but experiments that cost hundreds of lives and hundreds of millions of dollars in property damage are not something to be intentionally made by man. Rather, experiments at the Army Engineers' station pack 602 miles of the Mississippi River in a space only 1,100 feet long.

If the levees of the lower Mississippi River hold in the present crisis, much of the credit will go to the experiments which forecast their behavior.

By comparison with real life the model of the river seems tiny, but it is the largest structure of its kind ever used in the world. Most important of all it is accurate to a high degree, and that is what provides its greatest engineering usefulness.

Director of the Waterways Station, F. H. Falkner, First Lieut, Corps of Engineers, states that the floods of 1927, for example, have been duplicated in every detail with the model.

16,000 Square Miles

In minute attention to existing detail the model comprises the entire overflow area of the alluvial plain of the Mississippi south of Helena, Arkansas. It includes 602 miles of the main river, its five principal tributaries, all backwater areas and the entire Louisiana Sugar Bowl area of the Atchafalaya Basin, to the Gulf of Mexico. Total area represented is 16,000 square miles.

Forty-two engineers are required to work the model during tests. They attend 17 water supply lines and read 210 gages. When a flood year is reenacted the flood is duplicated on a daily time schedule that follows the risings and lowerings of the real flood. Daily changes are made in the discharge of each stream shown in the area, and the river gages are read daily. The form, height and time of travel of the flood waves are recorded, and the routing of the flood waters through the intricate system of channels and reservoirs is carefully checked.

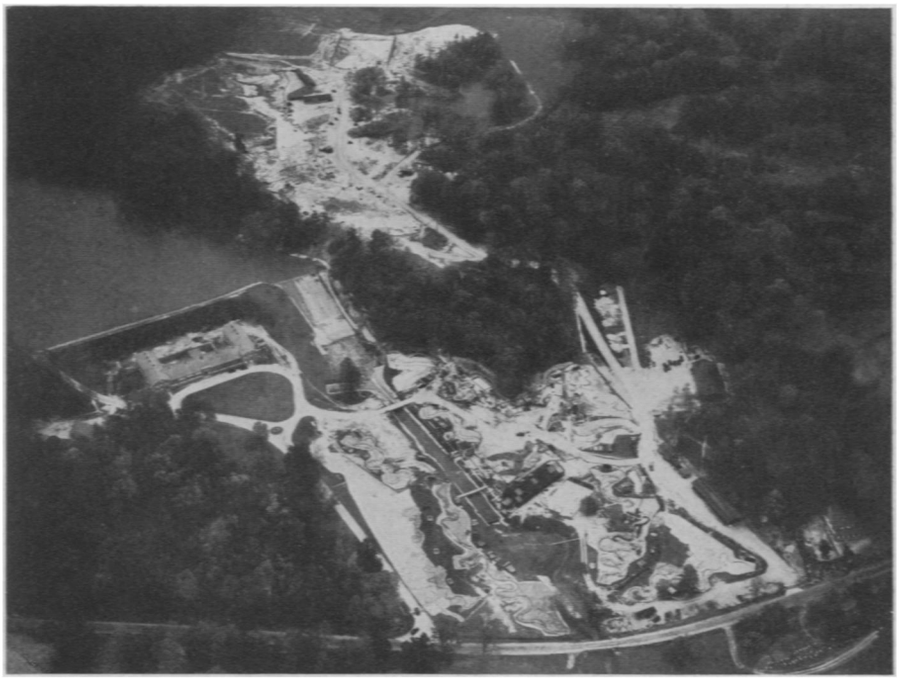
Four projects have been studied by Army Engineers during the last year on the Mississippi model. First was a study on the efficiency of the various cut-offs dredged through bends in the river. Notoriously meandering in some portions of its course, the Mississippi is gradually having its back straightened in places by these cut-off channels dredged by the Engineer Corps craft. By simple changes in the model, a before and after picture of these dredging operations can quickly be obtained. Moreover, as an extension of this type of experimentation, the engineers can dig cut-offs in their model and see where they should reasonably be applied in actual practice.

Flood routing through the great Atchafalaya Basin using various types of diversion outlets has been another study project during the past year. This whole great area on the west side of the river south of the Red River is the natural overflow valley of the Mississippi as it seeks the shortest path to the Gulf of Mexico.

Flood protection is provided to New Orleans by this floodway path for high water.

In the current flood, which has yet not reached this district, there is almost a certainty that the region will again be flooded as it was in 1927. While the findings of the Vicksburg Experiment Station can hardly yet have been put into practice, the results, one may be sure, will be applied in the future.

Even now, until taken from their experiments by the current emergency, the Vicksburg engineers were studying the extent and sequence of construction work that would have been required



STRONGHOLD OF FLOOD FIGHTERS

U. S. Army Air Corps photographer took this picture of the 245-acre Vicksburg, Miss., reservation where the Corps of Engineers Waterways Experiment Station is located. Army engineers here build giant models of rivers and harbors and test out proposed construction. Twisting bends of winding rivers can be seen. Pride of the station is the giant model of the Mississippi, shown at the top center of the picture.

to have handled the 1927 flood and also the project superflood which has been "par" for the Mississippi flood control work of recent years.

If the present flood brings water levels to heights anticipated from the advance Ohio River disaster forecasts, the Army Engineers may have to set a new high water level for their theoretical superflood. In any event they will have new flood data to study in their miniature of the Father of Waters.

Out of the current disaster will probably come widespread work on soil erosion, reforestation and other stages of flood control, but wherever a new dike or levee or a constructional change in the river is contemplated, the Waterways laboratory will provide the first hurdle, proving whether it is really useful or not.

Science News Letter, February 13, 1937

RADIO

Scientific Journal of the Air Will Broadcast Cosmic Data

Information About Sunspots, Radiation, Magnetism, To Be Sent Out Daily From Station W1XAL, Boston

A NEW scientific journal, one that is issued by radio rather than with paper and ink, was inaugurated at Boston on Feb. 1, when World Wide Broadcasting Foundation's short-wave station W1XAL began a regular schedule of broadcasts of cosmic data and scientific news. W1XAL in this activity cooperates with the Union Radio Scientifique International, familiarly known in scientific circles by its initials URSI, and Science Service. Each afternoon W1XAL will announce in plain English technical data on observations of sunspots, solar radiation, magnetism, ionized layer heights and other phenomena that have been observed in far corners of the world during the same day.

The primary purpose of these broadcasts is to make such information available internationally and to interest scientifically inclined laymen in the making of observations.

For nearly seven years Science Service in cooperation with the American Section of the Union Radio Scientifique International has collected and distributed daily information about these fundamental inconstants of nature. The Army Radio Net has brought some of this information to Washington and the Navy has lent its valuable cooperation in the broadcasting of the daily cosmic data messages in international Morse code from NAA, Arlington, at 5:30 p.m. Eastern Standard Time on 9250 kilocycles and 4390 kilocycles.

Through arrangements effected by Walter S. Lemmon, radio engineer who is founder and president of the World Wide Broadcasting Foundation, the facilities of educational short-wave station W1XAL are made available for the extension of the ursigram service in cooperation with Science Service. This station, licensed for international broadcasting on four frequencies, now operates on 20,000 watts and is heard with good volume in almost all parts of the world. These broadcasts of cosmic data and scientific news should, therefore, be available to listeners anywhere who are suitably equipped with standard all wave receivers. Mr. Lemmon stated this new radio service "will aid world-wide cooperation in scientific observation and make more effective the correlation of cosmic causes and cosmic effects."

The broadcasts from W1XAL will be heard daily from 4:55 to 5:00 p.m. Eastern Standard Time on 11.79 megacycles (25.4 meters) and weekly summaries on Monday evenings from 8:30 to 8:45 p.m. EST on 6.40 megacycles (49.6 meters). The daily broadcasts will cover current data; the Monday evening broadcasts will be a weekly compilation.

The program inaugurating this new service included brief talks by Dr. A. E. Kennelly of Harvard University, the co-discoverer of the Kennelly-Heaviside layer, Dr. Harlow Shapley, director of the Harvard College Observatory and trustee of the World Wide Broadcasting Foundation, W1XAL; Dr. Loring B. Andrews, chairman of W1XAL program committee, and Watson Davis, director of Science Service.

Science News Letter, February 13, 1937

An elephant's heart beats about half as fast as a man's.

The meadowlark turns its back on any one approaching it, thus concealing its bright yellow breast.

BROADCAST A JOURNAL

Inaugurating the broadcast of a scientific journal of the air are (left to right) Prof. Harlow Shapley, director, Harvard College Observatory; Dr. A. E. Kennelly, Harvard, co-discoverer of the Kennelly-Heaviside radio reflecting layer of the atmosphere; and Dr. Loring B. Andrews, astronomer-chairman of the W1XAL program committee.