METEOROLOGY

Test Mountain Winds

To discover how world's glider record was achieved, a moving mountain in a ten-foot tank has been set up. Another model will aid study of atmospheric temperature differences.

➤ OTHER THINGS than faith are moving mountains. In a laboratory at Johns Hopkins University, Baltimore, a model of the mountains of the Sierra Nevada range near Bishop, Calif., is being moved back and forth to try to discover how the world glider record of 45,000 feet was achieved in wind currents set up around the mountain.

This work was revealed by Dr. Robert R. Long at the American Meteorological Society meeting in New York. His moving mountain is in a tank ten feet long, two feet high and five inches wide. The air around the mountain is represented by layers of three different fluids, the bottom fluid being heaviest and the top lightest in weight.

Not only does he hope to discover how the fast-moving vertical wind current that can take a glider up to 45,000 feet is set up near the mountain, but also he hopes to find out some of the seasons for the different kinds of turbulence around such mountain chains as the Rockies, the Andes and the Himalayas.

Dr. Long's mountain, a smooth round object, is moved back and forth along the bottom of a channel. Thus, relatively, the liquid atmosphere is moving against the mountain. The denser "air" in the bottom moves up and over the top of the mountain, then it tumbles down the other side, gathering speed as it goes.

Down at the bottom it is in a highly unstable condition, and sometimes takes what is called a hydraulic jump, extending high into the troposphere about 40,000 feet. The faster the air speed across the top of the mountain and the less dense the air near the ground, the better chance there is for a terrific hydraulic jump. From observation of these jumps in the laboratory will come new knowledge of how our weather is generally affected by mountain chains.

At the University of Chicago, Dr. Dave Fultz is getting ready to measure temperature differences in a model of the atmosphere of the entire Northern Hemisphere. The model, with a radius of seven and one-half inches from the "North Pole" to the "equator," shows a change in temperature of about 10 degrees Fahrenheit, a big jump in such a small space.

By measuring temperature differences at various places in his model, Dr. Fultz hopes to find out more about how cold air moves down from polar regions in the winter, and warm air moves up from the equator during the summer.

Science News Letter, February 14, 1953

AGRICULTURE

3 Tons for Each Person

➤ AMERICAN LIVING standards require almost three tons of products from farms and forests each year for every man, woman and child in the nation.

To meet the constant and growing demands on agriculture to supply enough food and fibers for the American people, the resources of science have been called into play on an enormous scale.

The annual report of the U. S. Department of Agriculture's Bureau of Plant Industry, Soils and Agricultural Engineering is a veritable encyclopedia of advances in the science of agriculture. The report lists some 50 new and improved crop varieties released during the year, including varieties resistant to disease, with higher yields and with wider growth ranges.

Among the long-term advances of science in agriculture are the development of hybrid corn; the use of more and better fertilizers; the coming of DDT; production of disease-resistant varieties of plants; use of mechanization, electricity, and soil conservation techniques.

Scientists have their job cut out for them in their search for new ways to increase American agricultural production, in the race between food supply and population increase. Here are some of their points of attack:

(1) Insect damage and disease destroy billions of pounds of food and fibers each year. Insects cost the U. S. $4,000,000,000 a year in crops and livestock. Ten percent of all farm animals are lost to disease and parasites. Science must find new weapons against these enemies.

(2) Ways to use fertilizers more effectively must be found. Farmers use $1,000,000,000 worth of plant nutrients a year to get present production. But scientists admit that the full benefit of fertilizers is not obtained because of lack of knowledge about how they work.

(3) New varieties of plants and animals with high food yield and resistance to disease, adverse weather and soil conditions must be developed.

(4) Chemistry must continue to add to the productiveness of the soil. Chemical weed killers, soil conditioners, antibiotics to increase plant and animal growth are just a few of the contributions of this science to agriculture.

(5) Agricultural engineers must find better ways of cultivation, soil conservation and irrigation. New machinery for farms must come forth every year.

The race for food is a race against time. American standards of living depend directly on the productiveness of this nation's soil. If America's agriculture fails to keep pace with the increase of population, our standards must drop. But the promise of science is that this will never happen.

Science News Letter, February 14, 1953

SCIENCE NEWS LETTER

VOL. 63 FEBRUARY 14, 1953 No. 7

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postage zone number if you have one.

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566, and 360 N. Michigan Ave., Chicago, STate 2-4822.

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