

PHYSICS

We'll Grope in Dark

When atom bomb falls on us, light many times more brilliant than sun will be first warning. Eye witness observations of Science Service representative.

See Front Cover

By HELEN M. DAVIS

Special coverage of the April 22 atom bomb exploded at Yucca Flats, Nev., as written by editor of Science Service's magazine, Chemistry.

► LIGHT 10 times in brilliance the glory of the sun may be your first warning of attack by an atomic bomb.

If so, that may be the last vision you will ever have. The blinding flash may never clear from your eyes. You may be left groping in darkness to face the bitter day when nuclear energy is turned against us.

We who saw the A-bomb at Yucca Flats were safe. Hundreds of people in the Atomic Energy Commission, the Sixth Army and the Air Force had worked for weeks to put on a stupendous spectacle in which troops and observers were close but protected.

This will not be the case when an enemy drops the bomb. For us goggles of extra density protected our eyes for those first five seconds till the atomic super sun had cooled to an enormous ball of flame. As this fire dies the familiar shining white mushroom rises from the cinder of dark cloud. The cap of the mushroom is a gigantic smoke ring. Hot gases billow up through the center and cool at the top to form a glaze of ice. Cloud forms curl down over the outside, preserving the ring form. Luminous white, but tinted with yellow and rose, its unearthly beauty gradually fades leaving a cloud scarcely to be distinguished from the cumulus that dots the blue sky.

All this you might see of an enemy's bomb if you were lucky in escaping the first flash, provided you were ten miles away. A considerable number of seconds later the puff of hot air, the sound of the deep boom and the rush of the blast wave arrive together. And after that, some three miles from the bomb's target, an ominous column of black smoke comes up. This time it was a wooden shed. In Hiroshima it was the fire-storm that destroyed the city.

To the military, the atomic bomb is a powerful fire bomb useful for wiping out enemy strong points. To the scientist, the explosion is a test to learn much he would like to know about how atoms behave and why windows sometimes in one nearby town, sometimes another, are lifted out onto the sidewalk by the blast wave. To the ob-

server, it is a beautiful and fearful sight. If you are a victim, that first vision of unimaginable light will probably be yours. Its equivalent is registered on instruments on the blast site. This message is transmitted to the control point in the instant after detonation, before the instrument that saw the flash is vaporized.

To See, Hear and Feel

To see, to hear and to feel at close range the effects of the atomic bomb, civil defense officials and representatives of the many news media perched like animals in a zoo on hillside boulders at News Knob, Yucca Flats, 65 miles north of Las Vegas.

Infantry of a Sixth Army task force, for safety's sake buried themselves alive closer to an atomic blast than any American troops heretofore. Three commanding generals shared foxholes with the men.

Experience gained in previous atomic shoots allowed a clipping of the safety margin for the spectacular show. Troops of the 82nd Airborne Division parachuted into the area just after the bomb exploded.

A line-of-sight short wave radio relay tower was planted by helicopter on a

mountain peak nearby in order to provide a channel for live television coverage of Operation Big Shot.

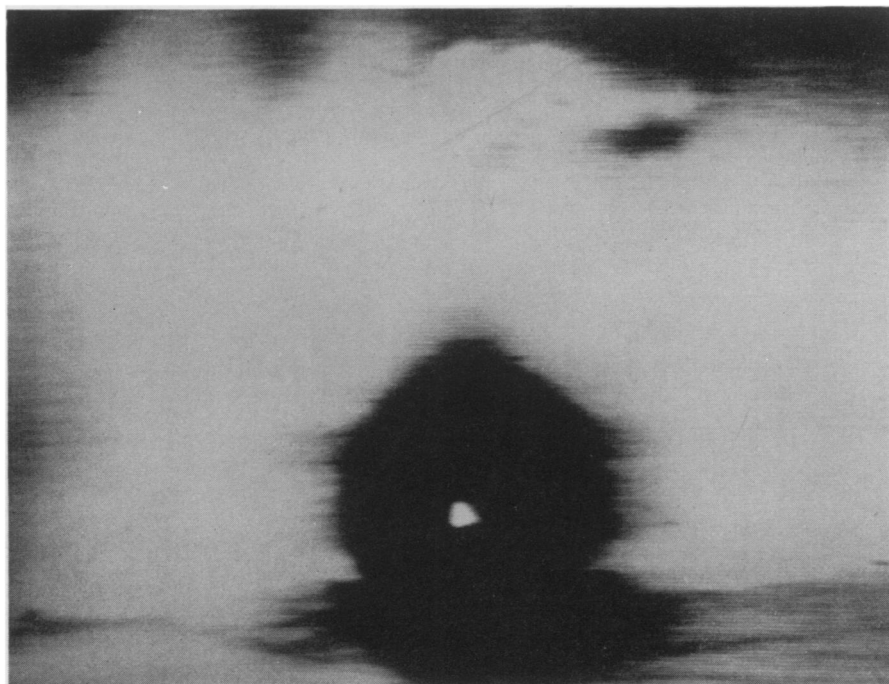
The annual rainfall of this region is two inches. Half of that fell on the gallery of "big shots" and news representatives as they got their bearings in anticipation of the atomic test.

Over Half Million Have Seen

Over a half million people have witnessed atomic bomb explosions. This is true even though the most recent detonation was only the third "public" demonstration of nuclear weapons in the seven years they have existed.

The two bombs dropped in war were seen by about 450,000 inhabitants of two Japanese cities, almost half of whom became casualties. In most of the other 26 atomic explosions known to have occurred in history up to the April 22 test, there have been sizable audiences, ranging up to the 42,000-man task force at the 1946 Bikini tests. Three of the 26 earlier test explosions are credited to Russia. U. S. atomic bombs have been exploded as follows: One at Alamogordo, two in Japan, two in Bikini, six at Eniwetok and 14 at the atomic testing grounds on Nevada's wasteland near Las Vegas.

The test atomic explosions have been peculiarly man's work. The bomb of April 22 was viewed by only a few feminine eyes, among the press, civilian defense and A. E. C. observers. A few A. E. C. women have seen earlier tests. The civilian observers were not as close to the bomb as some of



A-BOMB BLAST VIA TV—Snapped at the time the Operation Big Shot A-bomb was detonated, this picture shows the light flash that an estimated 12,000,000 television viewers all over the country saw on their TV sets.

the military forces brought in for atomic training but they had a closer view than any but the military and the AEC experts. Not since Bikini had reporters had such mushroom cloud ringside locations.

The energy unleashed by the atomic bomb is large compared with the power that runs our modern civilization. The plutonium in an atomic bomb liberates through fission nearly twenty million times as much energy as the explosion of an equivalent weight of TNT. The immense power of Boulder Dam produced during a month will be equalled approximately by an average atomic blast, and the April 22 blast was larger than average.

To keep these man-made energy sources in proper perspective, we must recall that the energy of a nominal atomic bomb is about the same as that of the sun's rays

falling on about a hundred square miles of ground during an average day. A strong earthquake has as much energy as a million atomic bombs.

Shown on the cover of this week's SCIENCE NEWS LETTER are two photographs taken during the Operation Big Shot atomic bomb burst. On the left, the fireball rises into the air. The smoke streamers to the left of the fireball are from measuring rockets. On the right, observers watch from a safe distance as the fireball of the atom bomb dissolves into a doughnut-shaped ring, colored a luminous white tinged with yellow and pink. The yellow on the west side is from the nitrous oxide, which is an expensive form of nitrogen fixation. The pink on the east side looked like the rose-colored strontium flame, but it may have been a refraction effect.

Science News Letter, May 3, 1952

the mirrored surface, the relative humidity of the air over the grain is easily found.

Apparently this hygrometer works with almost any grains or grain combinations, Dr. Ives has reported. It can help the farmer judge when to start work with a field baler, hay chopper or combine and when it is safe to stop running his hay or grain drier. Accuracy of the described instrument is within one-fourth of one per cent of the moisture in the grain.

The instrument is not on the market now, but Dr. Ives and the Institute hope that some manufacturer will soon start producing it.

Science News Letter, May 3, 1952

SCIENCE NEWS LETTER

VOL. 61 MAY 3, 1952 NO. 18

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N St., N. W., Washington 6, D. C., NORTH 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 postal zone number if you have one.

Copyright, 1952, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

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.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horowitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; L. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: Frank R. Ford, San Francisco News; John T. O'Rourke, Washington Daily News.

Officers—President: Harlow Shapley; Vice President and chairman of Executive Committee: Alexander Wetmore; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, A. C. Monahan, Marjorie Van de Water, Martha G. Morrow, Ann Ewing, Wadsworth Likely. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

AGRICULTURE

Less Grain Spoilage

► LESS GRAIN spoilage during storage is foreseen through the use of a glass-fruit-jar, moisture-telling device developed at the Inter-American Institute of Agricultural Sciences in Turrialba, Costa Rica.

Molds of one kind or another often develop on grains being stored. If the humidity is high, the molds may develop within a few days, and as little as a 10% drop in the moisture content of the air surrounding grain may make the difference between a storage period of about a week or a year or more.

Now Dr. Norton C. Ives has developed a quick indicator, easy for farmers to use, that will tell in a hurry just what is the moisture content of the air around grain in storage.

The bottom half of a two-quart fruit jar is filled with a sample of the grain being tested. Time is then allowed for the air above the sample to reach equilibrium with

the moisture in the grain and surrounding air spaces. This takes at least half an hour, but the reading for moisture content can be made in about three minutes.

The fruit jar has an especially built top which is actually a dew-point hygrometer, working on the same principle as the instrument used by meteorologists to tell the amount of moisture in the air.

A liquid with a low evaporation point, such as acetone, often an ingredient of nail polish removers, is poured into a thin metal tube in the special cap. Air is then forced through this refrigerant to hasten evaporation. Part of the outside of the thin metal refrigerant tube is chromium-plated and mirror-polished. It thus reveals the instant when dew begins to form.

A precision thermometer is placed in the refrigerant and another in the grain. From the difference in these two temperatures at the time when dew began to form on

Question Box

ACOUSTICS

How can noise on airfields lead to plane crashes? p. 278.

ASTRONOMY

What atomic bomb element has been found in the stars? p. 278.

FOREST PATHOLOGY

What are two effective methods for fighting oak wilt? p. 282.

GENERAL SCIENCE

What would be the function of a taxpayers' advocate? p. 283

Photographs: Cover and p. 275, United Press Telephoto; p. 277, Consolidated Vultee Aircraft Corp.; p. 279, National Bureau of Standards; p. 282, Ohio Agricultural Experiment Station.

ICHTHYOLOGY

How does the weather affect the number of fish you catch? p. 281.

MEDICINE

What trends have been found in children of A-bomb victims? p. 280.

OCEANOGRAPHY

What is the largest solar tide yet measured? p. 278.

TECHNOLOGY

How will front-line phones of the future "ring"? p. 286.