

## PUBLIC SAFETY

# Russian Civil Defense

➤ IN SHARP CONTRAST to present United States policies, the Soviet Union operates "an elaborate civil defense system and a massive civilian program of compulsory training."

All Soviet civilians now have a continuing obligation to take Civil Defense instruction. Rough estimates of the Soviet Government's expenditures for an 18-hour training program, begun last year as the latest in a series, run from \$100,000,000 (figured in United States dollars), for 50,000,000 trainees, to \$200,000,000, for 100,000,000 trainees.

The amount believed spent by the Soviets for this fourth and latest Civil Defense course is between six and 12 times as much as the \$16,509,000 spent for training and information distribution by Federal, state and local governments in the United States during fiscal 1960.

For the same period, total enrollment in both basic and technical Civil Defense courses in this country is estimated at only 1,292,000 persons.

The Soviet set-up is outlined in a memorandum submitted by Frank B. Ellis, Office of Civil and Defense Mobilization director, at budget hearings before a House appropriations subcommittee in Washington, D. C.

The present required Soviet course deals with practical training in post-attack problems. Instruction and practical exercises are undertaken in such subjects as evacuation and shelter procedures, protection

against radioactive fallout, fire fighting and rescue operations, medical first aid and evacuation of casualties, and personal and area decontamination procedures. Work concludes with a three-hour examination, including practical demonstrations by each trainee.

Previous training cycles, beginning in 1955, featured a 10-hour theoretical course, a 22-hour lecture course with equipment demonstrations, and a 12-hour course (14 hours in rural areas), again including practical exercises and an examination.

A Soviet program of shelter construction also is under way. Information is scarce, but OCDM believes protective construction in apartment houses and other new buildings is "a standard practice in many centers of population and industry." Solid-wall basements with reinforced concrete ceilings, to protect against radiation, are thought to be "available to an important segment of the urban population" in many Soviet areas.

Mr. Ellis said the Soviets "appear to believe that in modern warfare the frontlines would be on the homefront."

Before 1954, the USSR distributed no information on nuclear weapons and their effects, confining defense courses to conventional weapons and World War II gases. But when this policy was changed, extensive training began on defense against fission weapons.

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## METEOROLOGY

# U-2's Are Weather Planes

➤ THE U-2 "spy" planes that caused an international furor are now winging over global land and oceans on peaceful missions for science.

The planes, which first became known to the general public last year when one was "shot" out of the Russian skies, have actually been collecting data for weather research since 1956. The planes have been flying straight into Pacific hurricanes, twisting tornadoes in the south central United States, and the atmosphere's jet stream high above the earth, in a relentless attack on the unknown whims of the weather.

These "flying weather stations" snap pictures of cloud cover and record wind velocities, temperatures and other measurements which are stored as decimals in an information "package." A ground computer later converts the data into specific weather readings for scientists to study.

The idea of U-2 weather planes in weather research originated in 1956 with the National Advisory Committee for Aeronautics, forerunner of the present National Aeronautics and Space Administration. In a joint program with the Air Weather Service of the U. S. Air Force, the planes were used for high-level atmospheric research.

Today, four U-2 squadrons tapped for service from the Strategic Air Command, are flying reconnaissance missions for the Air Weather Service from bases strung out from Alaska to Australia. Some are co-operating with the U. S. Weather Bureau in its fight against twisters cutting through "tornado alley," others are flying over Europe studying turbulent air. Next goal for the near future: the hotbed of storm activity in the Caribbean where many hurricanes are born.

Scientists paint a glowing picture about the usefulness and potential of U-2 weather research planes. Results from the Pacific typhoon studies are already being incorporated into future weather satellites research, Lt. Col. Robert C. Bundgaard, project officer of the Air Weather Service U-2 program, reported. The long-range, high-altitude weather project will also enable airlines to work out flights that would avoid rough or bumpy rides at certain altitudes above the continental United States.

Perhaps the biggest goal of all is that the role the U-2 is now playing in weather research will help control the violent tornadoes that killed 49 people in 1960.

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## MINERALOGY

# Black Diamonds Formed By Shock in Graphite

➤ DIAMONDS were artificially formed when an explosive shock ripped through a tiny pile of graphite.

Although not the type of diamond that would go in an engagement ring, the black diamonds were still the first ever produced by a shock wave. The diamonds sprang into existence when a one-pound explosive charge was set off, driving a split second shock wave into a graphite container with a force about 3,000,000 pounds per square inch.

Although the purpose of the experiment was "to study the effects of explosive shocks on various minerals," experimenters Dr. Paul S. DeCarli of the Stanford Research Institute, Menlo Park, Calif., and Dr. John C. Jamieson of the University of Chicago do not overlook the fact that this may be a new way of creating man-made industrial diamonds.

The experiments also unintentionally demonstrated that diamonds found in some meteorites could have formed under high pressure when a meteorite slams into the earth. Some scientists support this theory, introduced by Dr. Edward Anders of the University of Chicago, whereas others believe the diamonds formed deep within a body in outer space that later crashed into the earth.

"Although the experiment strongly supports Dr. Anders' theory, it does not discredit the other idea," Dr. Jamieson told SCIENCE SERVICE. "The experimental shock wave, of much shorter duration than when a meteor hits the earth, will have to be lengthened in some way before a definite conclusion can be reached."

Diamonds have been produced artificially in this country, Sweden, and Africa since 1955, but these processes all use a catalyst plus high laboratory temperatures and pressures instead of shock waves.

The experiment is reported in the journal *Science*, 133:1821, 1961.

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## SPACE

# Successful Flight With Rocket Belt

## See Front Cover

➤ AN EXPERIMENTAL rocket belt has been tested successfully for individual manned flight without a vehicle.

More than 30 controlled flights have been made with the belt, built by Bell Aerosystems Company, Buffalo, N. Y., for the U. S. Army Transportation Research Command.

Test engineer Harold M. Graham has accomplished the "Buck Rogers come true" feat of flying up to 360 feet with the belt, which includes a rocket on the back as shown on the cover of this week's SCIENCE NEWS LETTER.

Average altitude on distance flights has been three to four feet, but hilltops up to 30 feet have been flown.

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