lation could not be sustained by the available supplies and facilities. The survivors would compete among themselves for sustenance; some would face death from starvation and neglect. The resultant conflict and social chaos would severely hamper efforts to develop a recovery program and probably lead to the ultimate extinction of a highly organized society.

"Even if it were possible to shelter industry as effectively as population, these preparations would be useless unless some means were found to protect the nation's agricultural lands and the biological stability of the earth's surface from possible irremedial destruction from radiation and fires."

Despite the criticism, the civil defense authorities go right on locating and stocking potential new shelters.

Minor Changes Emphasized

The present program is emphasizing minor construction changes in existing buildings to make them suitable as shelters. For example, low-cost ventilation changes are being recommended in many structures. And civil defense advisers are encouraging the consideration of fallout protection at the design stage of new construction.

In cooperation with the Office of Civil Defense, the Army Corps of Engineers has conducted surveys designed to add to the water supplies in fallout shelters. About 1,000 buildings across the country have been surveyed to determine the amount of water "trapped" in the regular plumbing systems of the buildings.

The surveys showed that the buildings contained on an average trapped water amounting to 28 quarts per shelter space. The minimum public shelter water requirement is 14 quarts per shelter space, for a two-week stay.

In addition to the shelter program, the Office of Civil Defense is also deeply involved with warnings and communications networks.

The present Civil Defense Warning System is a combination of Federal, state and local systems. The Federal system is basically an extension of military warning and detection systems. A network would spread the word of an attack to local authorities who have the responsibility for sounding public warning devices.

To maintain communications, an Emergency Broadcast System has been established. This EBS would have two basic responsibilities in an emergency. Authorized commercial broadcasting stations would have the responsibility of getting out basic civil defense instructions to the public. At the same time, the entire communications networks remaining operable would have to be at the disposal of the President in his efforts to resolve the emergency.

Developing the mechanism to meet this dual responsibility—the need to instruct the people without obstructing official negotiations in an emergency—is a fundamental part of the Office of Civil Defense public information program.

Critics of civil defense, specifically the scientific advisory board of the Committee for Nuclear Information and its publication, Scientist and Citizen, appear to believe that false, or at least undetermined, factors are being assumed as truths on which to build a civil defense program. They particularly hit as patently wrong any arbitrary assumptions on the size of any nuclear attack.

They also believe that no clear, scientifically proved case has been made as to the feasibility of civil defense against a nuclear attack, that more study is needed from all sources to arrive at a sound conclusion.

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GEOPHYSICS

Reduce Earthquake Deaths

➤ DEATHS FROM EARTHQUAKES can probably be reduced 80% within 10 years.

This great reduction in death tolls could be achieved by a warning system comprised of many delicate instruments in earthquake-prone areas, careful zoning of building sites in cities and suburbs, and use of especially designed building materials and structures.

A large decrease in loss of life and property from earthquakes was predicted in Washington, D.C., by Dr. Frank Press, of the geology department at Massachusetts Institute of Technology. Dr. Press heads a panel set up by President Johnson's Office of Science and Technology after the 1964 Good Friday earthquake in Alaska to study possible methods of predicting earthquakes.

A 10-year program estimated to cost $137 million was proposed in a report by the panel, whose members include scientists from the California Institute of Technology, Princeton University, the U.S. Geological Survey, the U.S. Coast and Geodetic Survey and the National Science Foundation.

The program would involve setting up clusters of such sensitive instruments as tiltmeters, strainmeters and lasers along major geological fault areas in the United States, mainly in California and Alaska. Other instruments would detect subtle yet important changes in the earth's sea level, magnetic field, gravity, electrical conductivity and density of rock.

Using new precise instruments and a large-scale approach to checking on earth's many movements, prediction of earthquakes is now a foreseeable reality.

The growing reserves of talented and trained engineers, technicians and earth scientists are essential to the earthquake forecast program, Dr. Donald F. Hornig, director of the President's Office of Science and Technology, said.

Dr. Press noted that engineers would determine by careful research those regions where severe quake damage is likely to occur. Studies would be made on the topography of regions, properties of soils, mechanics of landslides and other geological phenomena.

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