carrying out the experiment. The shipboard irradiator, with ancillary equipment, will be provided by the Government of the USA, which will make a cost-free expert available to Iceland for its installation in Reykjavil. A fisheries irradiation expert will also be provided by the US for the first month of operation.

In preparation for the project two Icelandic fishing specialists are spending a short period in the USA to study irradiation methods.

Rules formulated by the IAEA for protection against radiation will be applied by the Icelandic Government.

Although Iceland has no plans at present for applying irradiation for the preservation of fish it is taking part in the experiment because the information gained may be useful in the future.

The irradiator unit to be used in Reykjavik is enclosed in a cylindrical casing approximately 150 cm in diameter and nearly 2 m tall. Its weight, including the protective shielding and a radioactive cobalt source of 35 000 curies, is 17 tons. In use at sea it is envisaged that it would be carried on the parent ship of a fleet of trawlers.

GUIDE TO NUCLEAR METHODS OF STUDYING WATER

Is there abundant water underneath an island always considered arid? Are there holes in mountain lakes and if so where do they lead? If mines are built does seepage rob towns of their water supplies? Can a desert region be made to flourish? How long does it take for evaporation from the sea to return to its source? To find the answers to these and a multitude of other questions related to the water needs of growing populations the experts have added many nuclear techniques to their methods of investigation. The Agency is soon to publish the first guide for those who use such techniques.

Isotopes are the tools. These are atoms of elements differing slightly from normal atoms, and some are radioactive; instruments can trace them in extremely small quantities. They may be included in radioactive chemicals produced artificially or they may occur naturally in rain or snow. These latter include tritium, a radioactive isotope of hydrogen, considerable amounts of

which were produced in the atmosphere during the testing of thermonuclear weapons, or they might be the heavy non-radioactive isotopes of oxygen and hydrogen which are found in all natural waters in varying quantities. Apart from their radioactivity or slight difference in mass, they differ little from their normal companions in the water molecule, travel with them, and can be detected or measured.

Because of these characteristics, isotopes have provided important, sometimes unique, ways of studying water ressources. They can be used for investigating the amount of water flowing down a river, the age of snow in glaciers, the direction and flow of underground streams, seepage from reservoirs and canals into the soil, the time taken to recharge a body of water (and therefore how much can safely be used each year) origins of springs and lakes and similar questions.

Now, for the first time, the nuclear techniques for hydrology which have been developed and tried in many countries by many scientists, have been put together in a guidebook for general use. It has been drawn up by a working group designated by the Co-ordination Council of the International Hydrological Decade and composed of experts from nine countries (France, Federal Republic of Germany, India, Israel, Italy, Sweden, USSR, UK and USA) with others from FAO, UNESCO, IAEA and the International Association of Scientific Hydrology. They completed their examination of the draft at a recent meeting held at the Agency headquarters in Vienna; it has since been adopted by the Co-ordination Council.

The Guidebook will describe the nature of isotopic tracers, their advantages and drawbacks, and the distribution of environmental isotopes. Each section is related to a hydrological problem, and practical examples are given.

The working group was organized in 1966 to assist in co-ordinating that part of the IHD programme dealing with nuclear techniques in hydrology, to promote research and to prepare technical and educational material, with the Agency serving as its technical and scientific secretariat.