serious harm to man. This is a rather strange line of argument. To argue that tests should stop only if it were definitely established that their continuation would bring *certain* disaster to mankind, is a regrettable commentary on 2,500 years of progress since the Buddha. In fact, there can be no doubt at all that if civilization is to endure and progress, what is now necessary—and desperately so—is that the new knowledge of the atom, instead of being mobilized for weapons and war, should be mobilized in the cause of peace and plenty".

INDIA'S FIRST ATOMIC REACTOR

INDIA'S first atomic reactor at Trombay became critical and went into operation at 3-45 p.m. on August 4. This may be said to be a landmark in the development of atomic energy for peaceful purposes in this country.

The decision to build this reactor was taken by the Atomic Energy Commission at its meeting on March 15, 1955. Various different designs for the shape of the pool and the experimental facilities were discused by a committee consisting of Mr. Prasad, Dr. Ramanna, Mr. Rao and Dr. Singwi. Two possible designs for the pool were considered, one in which the reactor moves horizontally in a rectangular tank, and the other in which it moves in a vertical cylindrical well. The possibility of combining horizontal and vertical movements was also considered. It was finally decided to adopt the design with horizontal motion, as this provided the diverse experimental facilities which were needed for this reactor.

The reactor, which is housed in a hall 100′ long, 50′ wide and 70′ high, is of the swimming pool type, and consists of a rectangular concrete tank 28′ × 10′ and 28′ deep, with massive concrete walls 8½′ thick. The reactor is immersed in this pool of water, hence the description 'swimming pool type'.

The core of the reactor is approximately a cube of 2′ side, which is suspended by a rigid frame from a trolley above, which moves on rails mounted on the sides of the pool. The core consists of from 25 to 30 fuel elements containing the fissile material uranium 235 in the form of a sandwich. Each thin plate of uranium 235 aluminium alloy is sandwiched between two plates of aluminium. The fuel elements can be removed or placed in position by long aluminium rods operated from the trolley above.

When in operation, the fuel elements generate heat through fission, and are cooled by the water, which also acts as a 'moderator' for slowing down neutrons, and provides the necessary protection to the personnel against radiation. The reactor is provided with a number of automatic safety devices, which shut it down in a fraction of a second if one of a number of danger signs appears. For example, it will shut down if the electric power fails, or excessive heat is generated, or certain instruments fail. The reactor is of a type described as inherently safe. Even if all the automatic controls were to fail, and the reactor were to 'run away', the excessive generation of heat would convert the water into steam, and the reactor would automatically shut down, bcause there would be no water left to slow down the neutrons.

The concrete shield is pierced by a number of holes, known as experimental channels, which extend towards the core of the reactor. Neutrons flow down these channels from the core to be used for experiments In these experimental channels materials can be placed for irradiation and later studied for the effects of radiation. Radio-isotopes can also be produced.

In addition to the experimental channels, there is, at one end of the reactor, an opening 6′ square, known as the thermal column, filled with graphite blocks of nuclear purity, which contain less than half a part per million of boron. At the other end of the reactor, facilities have been provided for shielding experiments. At this point the 8′ thick concrete shield is replaced by a 2″ aluminium wall behind which the concrete blocks are mounted on heavy trolleys. When the protective properties of some material is to be tested, the blocks are replaced by this material and the reactor is moved against the aluminium wall. The information so obtained is of use in designing shielding materials for more advanced types of reactors.

The reactor will be used for training personnel for the bigger and more complicated reactors, which are to come, for experiments in physics and for making radioactive isotopes for research in agriculture, industry and medicine. India will make the facilities of this reactor available to scientists of countries in this region and beyond.

The fuel elements for the reactor were provided by the United Kingdom under an agreement signed in October last year between the United Kingdom Atomic Energy Authority and the Department of Atomic Energy.