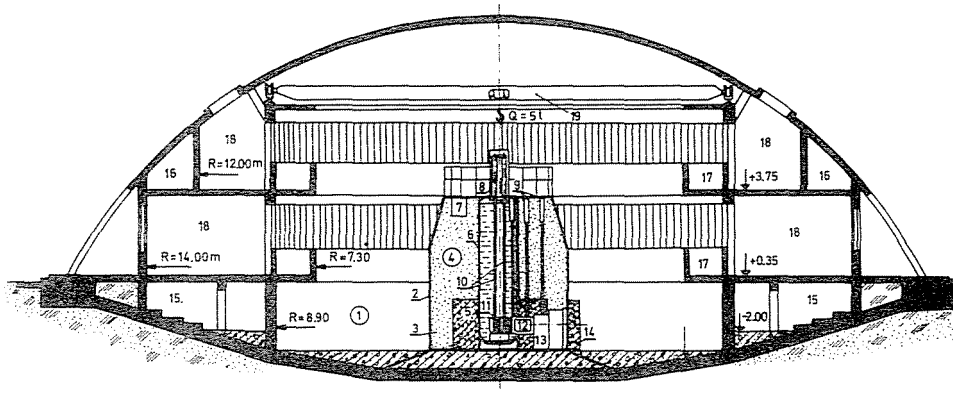
NUCLEAR TRAINING REACTOR OF THE TECHNICAL UNIVERSITY BUDAPEST

The Training Reactor of the Technical University Budapest, the first nuclear reactor designed and constructed in Hungary, went first critical on May 20, 1971. (Fig. 1). After an undisturbed operation for 10 years, the reactor of a maximum power of 10 kW had been reconstructed, utilizing the results of home development activities, and its maximum power was increased by an order of magnitude to 100 kW in 1981. The value of maximum thermal neutron flux associated with this reactor power is 2.7×10^{16} n/m^{2}s. Horizontal and vertical sectional views of the reactor block are given in Figs 2 and 3, respectively, while the horizontal sectional view of the reactor core is seen in Fig. 4.

Connected to the reactor are 5 horizontal channels of different neutron spectra and fluxes, and gamma/neutron ratios, serving first of all for experiments in the field of neutron physics. An irradiation tunnel built into the biological shield permits experiments to be carried out with large samples e.g. in the field of health physics, and a thermal column to be built in. Several irradiation channels running into the active core and reflector allow isotope production and neutron activation analysis. Three of these channels are directly connected to the radiochemical laboratories via a pneumatic rabbit system.

In the radiochemical and so-called channel laboratories, up-to-date instrumentation is provided to assist in education and research, including semiconductor detectors, multichannel analyzers etc. A small computer has been installed in the measuring centre.

The Training Reactor has been designed fundamentally for education. Students are regularly sent here from ten to fourteen Hungarian universities as well as from four foreign universities, first of all for practical training. A four week special postgraduate course was organized upon request of the International Atomic Energy Agency for experts from developing countries. Also, the Training Reactor and its staff contribute considerably to the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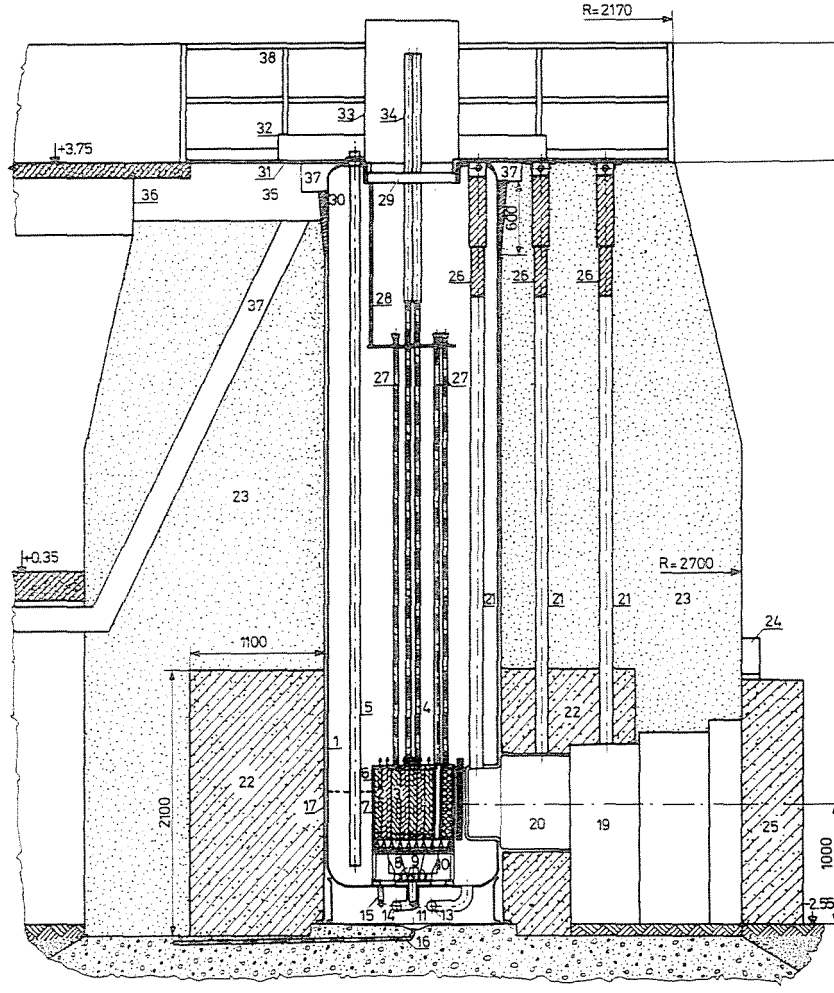
+0.35
-2.00

Fig. 1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6300
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Fig. 2

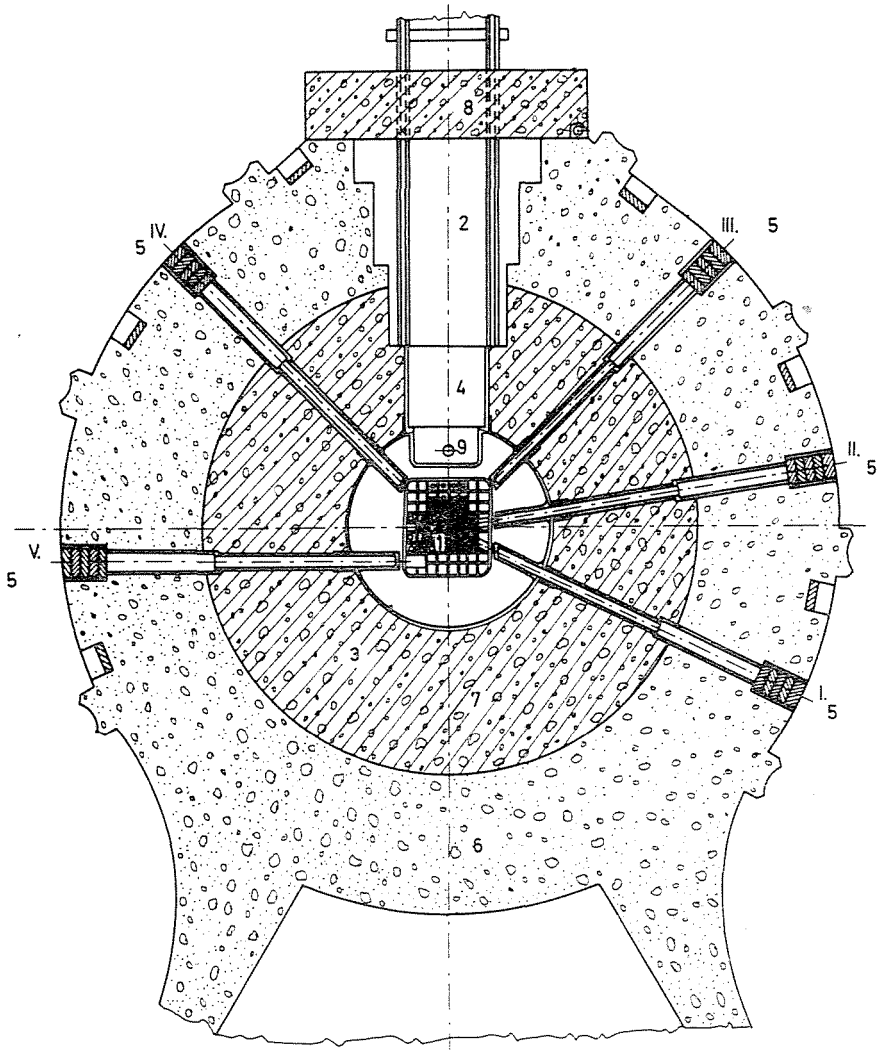

Fig. 3

education and postgradual training of experts for the first Hungarian nuclear power plant.

In addition to education, scientific research takes a prominent part in our activities. The scope of research is decisively determined by the national demand, and the potentials offered by the reactor. The main fields of research we are engaged in are: investigation of neutron and gamma radiation fields, development of methods and equipment for nuclear measurements, development and application of destructive and nondestructive nuclear material testing methods.

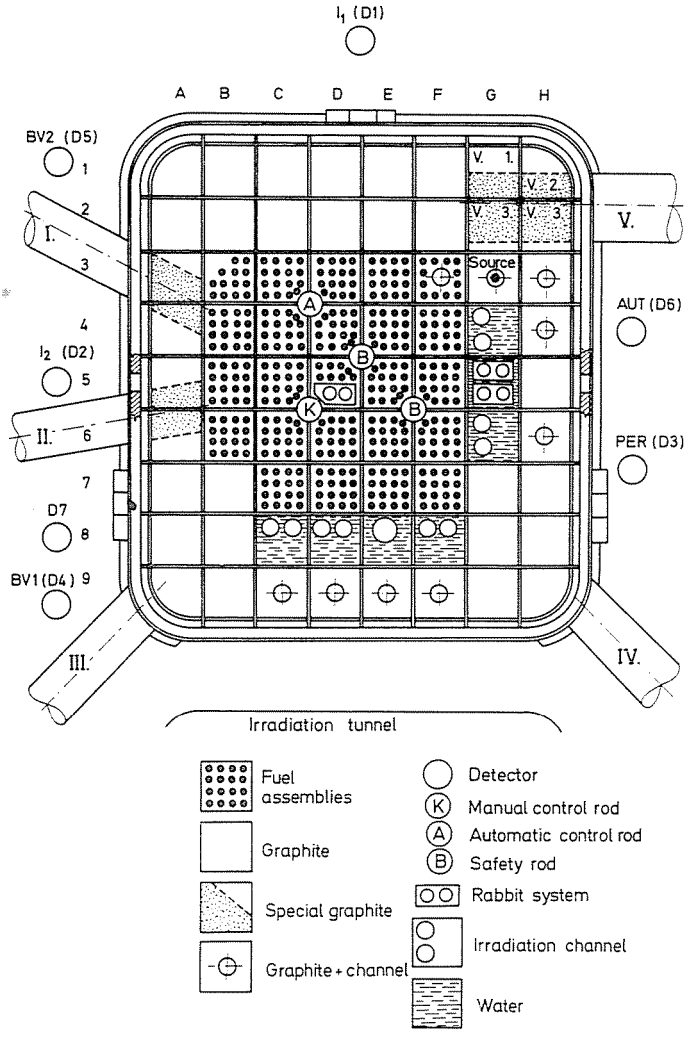

Fig. 4

In the following, first of all the investigations carried out in these fields, and some of their results will be discussed. We believe that the papers presented will not only yield actual information but also show how the Nuclear Training Reactor and its staff can contribute to scientific research.

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