planned to be of the high neutron flux heavy water moderated natural uranium type. Initial details of its design were made available in time for the Geneva Conference. Due to difficulty in getting Uranium and heavy water and due to bilateral agreement with U.S.A. for the supply of U^{235}, it was later decided to enter into an agreement with U.S.A. for the construction of the reactor. The CP-5 heavy water moderated enriched Uranium reactor was the one selected for this purpose and the work was entrusted to the American Car and Foundry of New York who specialise in this type of reactor. This firm has also had the co-operation of CISE experts in working out the design. Researchers of the Reactor Group of CISE are now in New York and Washington to work in collaboration with the firm on the project. The power of the reactor will be 5,000 kw. with a neutron flux of 10^{14} cm.$^{-2}$ sec.$^{-1}$ Detailed planning of the Ispra centre where it will be installed in the spring of 1958 is also under way.

The Electrical Industry has also taken a lead in studies and projects for the building of nuclear plants. The Edison group of power companies in Italy has signed an agreement with the Westinghouse Corporation of America for the purchase of a plant of 134 million watt capacity. This will be a pressurised water reactor using enriched Uranium as fuel. The possibility of increasing its output to 240 MW with a superheater fired by conventional fuel has also been contemplated. The Societa Elettronucleare Italiana (SELNI) set up by the main electricity companies is about to begin its activities. SELNI has already assembled a limited number of personnel, produced a draft project and begun the study of locations suitable for installing a nuclear power plant in Southern Italy. Negotiations with overseas firms for the design and operation of this plant are well under way.

In July 1956, the Fiat and Montecatani concerns entered into an agreement for the establishment of a Society for Research on Nuclear Installations (SORIN). SORIN has now reached an advanced planning stage for installing its first reactor of the swimming pool type with its connected laboratories. This is intended for industrial research and for the production of radioactive isotopes. Later, SORIN will instal a 150 MW. nuclear power plant and a second plant in addition. SORIN will also train nuclear technicians, the first group of whom are already at its disposal. A number of these are in U.S.A., U.K. and other countries completing their training and arranging purchase of plants and equipment.

Largely due to the efforts of the CNRN, a consciousness for the necessity of exploiting this new source of energy has grown in industrial circles as also in government circles with the result that Italy will not stand by, as a mere spectator during the industrial revolution of the atomic age involving every country in the world.

S. RAMA SWAMY.

ELECTRIC POWER DIRECT FROM FISSION

IN a recent number of Nucleonics, a novel type of reactor has been proposed which converts fission energy directly into electricity by causing ionised U^{235} gas to interact with a magnetic field.

The proposed reactor is cylindrical in shape and would contain the fissionable material in gaseous form. The temperature of the gas is high enough, so that part of it is ionised. Direct conversion is accomplished by driving the ionised (and therefore electrically conducting) fissionable gas do work against a magnetic field. The work done against the field appears as electrical energy in an external circuit. The dynamical motion of the plasma (hot gas) is so arranged that after each interaction with the magnetic field, the plasma configuration is reshaped by solid walls so that magneto-hydrodynamic instabilities cannot grow from cycle to cycle.

That electrical power is generated as a result of the interaction of the moving plasma with the coil-condenser oscillation can be understood in terms of the forced oscillation of a tuned electrical circuit. In this case, the coil and condenser in parallel, form a tuned resonant tank circuit. The oscillation is forced by the interaction of the induced eddy currents in the conducting plasma with the currents in the main coil. Eddy currents are induced in the moving plasma because the plasma is a conductor moving in a magnetic field. Since the induced current in the plasma is in such a direction as to give a net retarding force on it, the electrical oscillations in the coil condenser tank circuit are 'forced' to a greater amplitude at the expense of the mechanical energy of the plasma motion. The consequent conversion of the mechanical energy to electrical energy of resonant oscillation is the basis of electrical power generation.

Several advantages have been claimed for the proposed design.