Revista Brasileira de Física, Vol. 2, N.° 1, 1972

Nuclear Physics in São Paulo

OSCAR SALA
Instituto de Física, Universidade de São Paulo, São Paulo SP

I thought that it would be most appropriate on this occasion to give you a general idea of the development of nuclear physics at the University of São Paulo. I would like to begin with some history.

Science in general, in Brazil, is a relatively new subject. Perhaps with only a few exceptions which are mainly in that area of the biological sciences, we can say that research, at least in a organized way, started in 1935 with the creation of the University of São Paulo. This was the first university in the country to really take research seriously and dedicate sufficient effort to establish it as a definite activity. In 1935, the Govemment of the State of São Paulo invited a group of scientists from Europe to organize a University. Prof. Gleb Wataghin came from Italy and started the Physics Department. Counting on the collaboration of only a small number of people and with little material resources, he assumed the responsibility of initiating research in Physics. He was able to start a small research project in cosmic rays. Until the late 40's, this was the main area of research in experimental physics in São Paulo. At that time, we were all busy working and discussing with great enthusiasm the problems related to penetrating showers.

After the war, the Department of Physics began to grow at a much faster pace. About 10 to 15 years ago, we only had about 150 students while today we have over 3.000!

Perhaps because of the importance of nuclear physics during the war period, research began in this area in 1949 with the installation of a 22 MeV Allis Chalmers betatron. A research group was immediately formed around this facility. Their main contributions were in photo-nuclear reactions in the medium weight nuclei and in photo-fission. This group recently installed and put in operation a 70 MeV electron linear accelerator. The old betatron has been retired and, in fact, the old building was recently torn down.

Another nuclear physics group developed around the home-made 3.5 MeV electrostatic accelerator which was built during the period of 1952-1954.

The main research interest of this group was the study of deuteron induced reactions in light nuclei with the objective of understanding the reaction mechanisms which are quite complicated at these low bombarding energies.

Studies were made with poor resolution in order to obtain optical model parameters and determine if the optical model does give a satisfactory description of these reactions. Also high resolution measurements were made of most of the open channels in order to find better ways of taking into account the two extreme reaction mechanisms.

We feel that some progress was made along these lines including some analyses which showed examples of intermediate resonance structures. This showed that some complicated results can be greatly simplified if the correct point of view is adopted. An important contribution was the establishing of a theoretical nuclear physics group which interacted strongly with the experimental group.

This same experimental group is now involved with the installation of a new facility, the Herb Pelletron Accelerator.

The figure following the frontispiece gives a general view of this new laboratory. I believe that the dedication of the first tandem accelerator, about twelve years ago, marked the beginning of a renaissance in nuclear structure physics. It is not too much to hope that the appearance of the Herb Pelletron Accelerator, which represents a new generation of electrostatic machines, will also have a great impact on the field because of its unique features. We are indeed fortunate that we encountered understanding and encouragement from the Brazilian Government and its agencies for the support of science. I would like to make special mention of the Brazilian Bank of Economic Development (BNDE), the National Research Council (CNPq), the State of São Paulo Foundation for the Support of Science (FAPESP) and the University of São Paulo (USP), which supplied the necessary funds for the purchase and installation of the present facilities.

I am convinced that these new facilities will cause an impact in the development of nuclear physics in Brazil and constitutes a great opportunity for the younger generation of physicists.

We sincerely hope to be able to share our new facilities with our Brazilian colleagues from other centers as well as our colleagues from other countries. We believe that the establishment of a laboratory which is open to outside collaborators is most important at this time. I would like to remind you that our programs of collaboration with the Universities of Wisconsin and Oxford have proven to be most successful.