CHRONICLE

SCIENTIFIC RESEARCH IN THE SOCIALIST REPUBLIC OF RUMANIA AND IN THE HUNGARIAN PEOPLE'S REPUBLIC

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In the field of man-made fibres the research effort of the Socialist Republic of Rumania and the Hungarian People's Republic is not yet as ramified and efficiently organized as in other COMECON countries, for example the German Democratic Republic /1/, the Polish People's Republic and the Czechslovakian Socialist Republic, the explanation being the higher technical level of the man-made fibre industry in the latter countries. In Rumania and Hungary the industry did not start to develop until the mid-fifties and systematic scientific and technical research in this field was instituted during the same period /2/. The fast rate of increase in man-made fibre production in these contries, notably in Rumania /1/, combined with the measures taken at government level in the sixties with a view to improving the direction and planning of scientific research add interest to a review of the basic principles underlying the organization of the network of scientific research establishments in this field in these two countries.

A specific feature of the network of research establishments in Rumania and Hungary is the absence of institutes specializing, either on academy or on branch level, solely in problems relating to man-made fibres. Research in this field is carried out in part in the institutes of the Academy of Sciences, by the faculties of the higher institutes of learning, in the man-made fibre departments of branch institutes and in the research divisions of industrial establishments.

In Rumania the planning and organization of scientific research is in the hands of special committees under the Council of Ministers of the Republic. These committees are not only responsible for the development of the individual branches of science but are at the same time centres of data collection and information exchange, and they coordinate the activities of the relevant institutes of the Academy of Sciences, Ministries and scientific and technical societies of the Republic, the principal one among the latter being the Association of Engineers and Technicians. This Association publishes over 15 scientific and technical journals, among them some which contain articles dealing with man-made fibre research, e.g. 'Cellulose and Paper', 'Plastics', and 'The Textile Industry'.

Problems relating to man-made fibres research are dealt with in the Academy of Sciences of Rumania to a rather limited extent, viz. at the department of chemical sciences of the Peter Pony Institute /3/. These problems are the concern mainly of the institutes of the Ministry of the Petroleum and Chemical Industries and the scientific research organizations of the Ministry of the Light Industry.

Below follows a description of the structure and research acitivities in the field of man-made fibres of the scientific research institutes in Rumania /3/.

The Peter Pony Institute of Macromolecular Chemistry of the Academy of Sciences of Rumania in Yassy was founded in 1951. It was reorganized in 1962 on the basis of modern scientific research. The mid-sixties saw the creation of three further sections including one for research in organic macromolecular compounds. This section contains a department carrying out research in the mechanism of rayon spinning /4/ and chemical modification of viscose rayon.

Institute of the History of Natural Sciences and Engineering of the Academy of Sciences of the USSR; Academy of Communal Management. Translated from Khimicheskie Volokna, No.1, pp. 77 - 78, January - February, 1972.

The Chemical Research Institute, founded in 1947, is the principal institute of the chemical and non-ferrous metals industries. It is under the technical control of the Ministry of the Petroleum and Chemical Industry of the Socialist Republic of Rumania. The Institute has three main laboratories, viz. for analytical chemistry, physico-chemical research and organic chemistry. The latter has a laboratory section for plastics and viscose rayon. During the sixties the Institute concentrated its research effort on the production technology of polypropylene and polyvinyl alcohol fibres and on the mechanism of dyeing synthetic fibres.

The Scientific Research and Planning Institute of the Cellulose and Paper Industry and the Industry of Viscose Rayon and Rush Utilization /4/ (Bucharest). As long ago as 1948 experimental research was carried out in Rumania on viscose rayon spinning from rush cellulose. Currently, the main research effort of the Institute is concentrated on the structure of viscose rayon, physical and chemical methods of modifying viscose rayon and the effect of chemical reagents on the structure and properties of viscose rayon.

The Polytechnical Institute (Yassy). During the late sixties and early seventies the faculty of cellulose, paper and rayon technology investigated the elastic properties of fabrics processed from natural and synthetic fibres and developed a technology for dyeing fibres in a liquor containing organic solvents.

The Research Institute of the Textile Industry (Bucharest). The Institute was set up in 1951 and is engaged primarily on problems relating to the utilization of man-made fibres in the textile sector, among them brightening treatments, bleaching, dyeing and finishing cellulosic and synthetic fibres.

The research departments of several man-made fibre establishments and textile combines in Bucharest, Sibiu and Buchusi are also engaged on studies of some of the chemical and physico-chemical processes in the production and textile-processing technology of man-made fibres. These are mainly establishments of the light industry although there are several well equipped fibre-producing establishments in Rumania. The first production line for polyamide staple fibre came on stream at the Sevineszti fibre plant in 1959. By 1963 synthetic fibres were being produced at plants in Sevleneszti and Rosnov and rayon at plants in Kiskani, Bucharest and Lupeni /6/. Rumania is now mass-producing mainly modified viscose rayons and polyamide, polyacrylonitrile and polyolefin fibres.

In the Hungarian People's Republic the co-ordination and direction of scientific research including man-made fibres is based on a slightly different principle. All research is carried out in the institutes of the Academy of Sciences, in the branch organizations of ministries and at the faculties of the higher institutes of learning and is co-ordinated by the Council for Science and Higher Education under the Council of Ministers of the Hungarian People's Republic /3/. Research in the field of man-made fibres is to a considerable extent concentrated in the establishments of the Ministry of Heavy Industry, e.g. in the Institute of the Plastics Industry and in the research department of the 'Hungarian Viscose' plant in Nergeszefalu.

The development of scientific and industrial research in Hungary was influenced in a large measure by the decree relating to the radical reorganization of the control of the country's economy promulgated by the Central Committee of the Hungarian Communist Party in 1966 /7/. The principles underlying the reform of the system of financing scientific and technical research in Hungary are reminiscent of those described in an earlier report on the economic reforms in the German Democratic Republic /1/. Scientific and technical research in Hungary is financed from two sources, viz. funds set up by the producing establishments (the greater part) and a central fund for technical development created largely by contributions from producing establishments. The financing of promising research from this fund is planned by the State Committee for the Technical Development of the Hungarian People's Republic and the relevant ministries. The management of Hungarian industrial establishments have the right to decide the way in which research data required for more profitable production processes is to be acquired, i.e. by carrying out the research involved at the central laboratory of the establishment concerned or by concluding contracts with research institutes in Hungary or elsewhere, primarily in one of the other COMECON countries. In this branch of their work the institutes concerned are self-supporting, i.e. within the framework of the economic reforms they are regarded as research establishments engaged mainly in contract work for industrial organizations.

The profits of a scientific research institute, which amount to 5 to 85% on the wages fund, go to the material incentives fund of the staff. The system provides for a deduction in favour of the development fund of the institute equal to half of similar contributions from the industrial establishments. A special feature of the introduction of the economic reforms in Hungary is the fact that they were implemented simultaneously and not in stages as in other European socialist countries. In 1968 the principal elements of the new economic mechanism were introduced in all branches of the national economy at the same time /9/.

The structure and fields of activity of the principal organizations engaged on man-made fibre research in Hungary can be described as follows:

The Research Institute of the Plastics Industry of the Ministry of Heavy Industry studies the fine structure of man-made fibres, spinning and chemical modification processes (grafting of monomers), and the influence of the nature of the fibre on the process of graft polymerization.

In 1965 the Institute consisted of the following departments: research planning, radiation chemistry, micromorphology of polymers, polyesters, synthetic fibres, polyolefins, light-sensitive polymers, molecular conversions, ion-exchanger resins, plastics application techniques, plastics processing, experimental workshops, and a research group for machine construction and technology.

In the early sixties the department of synthetic fibres carried out extensive research on problems relating to the kinetics of the polymerization of caprolactam with catalysts and to the mechanism of combination polycondensation for producing polyester fibres of improved flexibility and dyeability. The department also developed a production technology and dyeing method for polypropylene fibres (co-polymerization of these fibres with acrylic acid, vinyl acetate and other monomers).

During 1966 the synthetic fibres department of the Institute studied polymer production for synthetic fibres, i.e. polymerization of caprolactam with catalysts; the properties of polyester fibres modified with glycidic esters and polyglycol ester; and the influence of the conditions of spinning on the mechanical properties of polypropylene fibre. The department developed a new type polyester fibre with improved dyeability and flexibility.

In 1970 the Institute carried out research on a contract basis for the 'Hungarian Viscose' plant in the fields of modifying the properties of polypropylene fibre with a view to improving dyeability, spinning fancy-section bicomponent fibres, and stabilizing fibre-forming polymers.

The Research Institute of the Textile Industry (Budapest) was founded in 1949 and is now the central organization for research in the physico-chemical properties and structure of natural and man-made fibres and of products processed from these fibres (including rheological and electrostatic properties) /3/. In 1959 the Institute had several departments including a textile-chemical department which consisted of laboratories for research in dyeing, finishing, etc. The Institute now has a department of chemical technology which researches the processes coming into being in the textile processing of man-made fibres, more particularly polyolefins.

The Institute of the Light Industry (Budapest) /3/ engages in research on timber materials, veneers, furniture materials and rayons, and studies problems relating to the economics, mechanization and automation of industrial process in these fields.

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An analysis of the structure and fields of activity of scientific research institutes enaged on man-made fibre research in Rumania and Hungary leads to the conclusion that the network of this type of institute in these countries is not yet as ramified and effectively organized as in other COMECON countries like the German Democratic Republic, Poland and Czechoslovakia. In Rumania and Hungary the scientific establishments come under the jurisdiction of various ministries and authorities and there is no central scientific research organization empowered to co-ordinate research in the field of man-made fibres.

In Rumania the most active industrial research departments are those of the fibre-processing establishments and in Hungary that of the 'Hungarian Viscose' plant.

The work of the Rumanian research establishments is more productive than that of the establishments in Hungary. This corresponds to the level of development of the man-made fibre industries of these countries.

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