FIRST SCIENTIFIC MEETINGS ON ERGONOMICS ORGANIZED IN ROMANIA

On February 21 — 23, the Institute of Working Capacity Expert Evaluation and Recovery, in co-operation with the Sociology Department of the Bucharest University, organized in Bucharest the first symposium on "Problems of Ergonomics", and on February 27 — 29, the "Tractorul" works in Braşov, in co-operation with the Institute of Hygiene in Bucharest, organized at Braşov a colloquy on applied ergonomics, with special reference to the mechanical engineering industry.

At the Bucharest symposium, a number of 63 papers were presented, illustrating the successful efforts of a group of about 120 experts in various scientific fields, as anatomy, physiology, psychology, hygiene, economy, sociology, design engineering, architecture, labour organization, legal proceedings, etc. The papers referred to the following topics: the definition of ergonomics and its place in contemporary society, methodological problems, the study of man—work correlation, i. e. problems of labour physiology and psychology, technology and environment conditions, specific aspects of transport sociology, problems of occupational direction and selection, causes and effects of work casualties, as well as problems of professional pathology.

Ergonomics was defined as a complex science of labour on the background of contemporary society and at the same level with the other scientific branches of knowledge. The area of this science has been defined as having an interdisciplinary scope, to which psychology, physiology, sociology, the economic sciences, organization and management science, the technical sciences and anthropology are contributing; it is considered that ergonomics is investigating the labour process, in order to increase labour productivity and working comfort.

By approaching a wide range of problems, regarding different questions as to the relationship between man, engine and environment, the symposium emphasized the part played by designing activities and by machinery and work environment improvements, with a view to adjusting them to man. Inasmuch as most of the specific contributions came from the transport area, technical suggestions were made on climatic control and noise reduction, accomodation of the chair to the driver, visual signals, medical and psychological examinations on the occasion of hiring manpower, occupational selection.

As to the ergonomic methodology, the operational statement of problems was pointed out as one of the most appropriate methods, as well as the settling of priorities in the ergonomic investigations, in order to attain their maximum degree of economy, the determination of typical jobs, of intervention areas and of causes inducing lack of balance between man and labour.

The international term of "check-list" was translated with the approximate meaning of "ergonomic inquiry list for the control of the working place". The check-list has been recommended as a necessary working tool; for this reason it is desirable to work out the check-list on the basis of professiological studies, which are to draw up the limits of typical jobs.

Among many aspects stressed at the symposium, we mention the relationship between ergonomics and scientific labour organization, the practical character of ergonomics and the requirement that production engineers take a direct part in the examination of working items.

On the occasion of the symposium it was suggested to create an initiatory commission for the establishment of collaboration in the field of ergonomic investigation, the annual organization of a general meeting for scientific reports; the need of organizing

postgraduate lectures on ergonomics, designed for the various specialists, and of allocating scholarships and stipends for documentation purposes in ergonomics, was also emphasized.

During the debates, the fact has been pointed out that the approach of ergonomic problems constitutes for production workers a stringent need, as in the present stage of rapid progress and uninterrupted technical and technological changes, the human factor plays an ever increasing part in the production of material values. As the rapid pace of change exceeds the accomodation capacity of human functions, production may be secured only through the dynamic balance between man and engine. This aspect of the problem is at the same time connected with increasing investment costs in man, as caused by the extension of the educational period and by the need of continuous training in entirely new professions. The efficiency of these investments, specific for contemporary economy, depends on the possibilities of adjusting the work environment and equipment to the operator.

The symposium proceedings also emphasized the requirement that the managing bodies in industry should know the ergonomic principles with a view to scientifically organize the many-sided activity of the enterprises they have in charge.

During the colloquy on ergonomics, having specific applications in the mechanical engineering industry, a number of 38 scientific reports were presented by over 50 research workers carrying on activities in various fields of science, such as anthropology, physiology, psychology, hygiene, sociology, education, engineering, economy, etc.

The opening speech was held by E. Oniga, general manager of the "Tractorul" works, who said that, through setting up in 1951 of a labour consulting room and by securing the microclimate in the halls of the works, they had succeeded, during the period 1954 to 1967, to reduce casualties from 12 per cent to only 9 per cent, while the annual labour productivity increased from 51,000 lei per worker to 940,000 lei per worker. By co-operating with the Bucharest Institute of Hygiene, the "Tractorul" works succeeded to eliminate the hard working conditions prevailing in some departments, without having to resort to additional costs.

Dr. G. Cadariu, Director of the Bucharest Institute of Hygiene, reported on "The Importance of the Human Factor in Industry", pointing out that besides struggling against occupational diseases, steps must be taken in view of controlling all noxious conditions prevailing at work places. When work is harmoniously carried on, the advent of fatigue is delayed. Technical progress has lead to the replacement of physical effort by the perceptive one, which is more straining. This condition results in the necessity, besides securing measures of occupational selection and direction, of comfort conditions, etc., to arrange by prescriptions rest breaks, in accordance with the specific efforts to which the worker is submitted at his work place.

In the paper "Ergonomics and Some Problems of Labour Organization", Lecturer Dr. O. Berlogea pointed out that the industrial enterprise is a socio-economic structure, including a system of organizational, information and human relationships, whose activity is based on technological, motivational and ergonomic factors. Until recently, the investigation of the labour process included the analysis of the work place, but as mechanization develops, the complex engine — man — environment must be taken into account. Consequently, in the investigation of labour, new trends of synthesis and of using ergonomic data have appeared.

In the report under the heading "Ergonomics, a New Scientific Orientation of Investigations Regarding Man in the Manufacturing Process", Prof. Dr. I. Mihăilă presented a short review of the ergonomic problems, pointing out the trends of development obviously appearing in this science. The development of sciences such as labour physiology, functional anthropology, anthropometry, psychology, etc., which provided numerous results, set forth the premises for the advent of ergonomics. The old principle, "man, appendage of the engine" has been given up and replaced by the principle of fitting machinery and environment conditions to the requirements of man. Space flights could not have been possible without the assiduous work of large teams of experts, who applied the principles of ergonomics. It was thus proved that man's ability to adapt himself being limited, there exists the danger of progress slowing down. However, by combining man's ability to adapt himself with the engine's and environment's capacity of being adjusted to man, technical progress speeds up.

The report on "Management Viewed as a Cultural Activity" made by the sociologist O. Neamțu, opposed the false ideas superestimating technique and considering the

engines as "thinking objects". Furthermore, the author pointed out that in fact, even the most improved electronic computer cannot outrun a piece of equipment as to its obedience towards man. Only the figurative language of science has created such illusions. Contemporary man—a scientist operating a computer, or a worker steering a piece of equip ment — has to be aware of the goal proposed and of the personality sense. Machinery must be subjected to social commands, that is to man, so machinery must be adjusted to man's needs. The concept of adaptation, that is of submitting to the commands of man, has been extended to the whole industrial unit. This is how the ideas of adjusting the industrial unit to man have come to appear. The re-designing of man means a continuous cultural activity that cannot be settled during the professional training, requiring, instead, a very long time. The re-designing of equipment, of environment conditions, etc., may, however, be accomplished during a much shorter period, in order to secure the consistency of man and his work.

A particularly practical report for industrial enterprises was made by the psychologist M. Mamali, under the heading "Fatigue Reduction Through the Rational Organization of Working and Resting Time". The State Committee for Organizational and Remuneration Problems, together with the Institute of Hygiene and the Institute of Psychology of the Romanian Academy, contributed to this report. A series of eleven strain factors of the organism during work was first described. The advantage of regulated rest intervals over the freely chosen breaks was substantiated.

The assignment of rest breaks must be made according to the analyses of labour productivity curves. A greater number of short breaks is desirable for a prevailing physical effort. In the case of a monotonous work, or at high temperatures, frequent short breaks are recommended. For activities requiring constant attention, infrequent pauses are desirable. During break time, rest might be active, the muscles not having been constrained during work being now activated. Moreover, even while work is developing, the onset of fatigue may be retarded by alternating the various sets of muscles, i. e. replacing the strained muscles by the relaxed ones. If, during work, such a reversion of muscle straining may be secured, the pauses required for rest become less frequent and have a reduced duration.

A great number of reports referred to practical applications at the "Tractorul" works, the "Brașov Truck Works", as well as other industrial units all over the country. On this occasion, the existence of production ergonomics, as well as of product ergonomics, was emphasized.

Two so-called "round-table debates" were arranged, referring to: (1) the occupational direction and selection of the youth, and (2) the work place arrangement.

The debates emphasized the unanimous agreement for the application of ergonomics in production. There have also been some diverging opinions regarding the place occupied by ergonomics in the study of labour, the scientific disciplines contributing to the solution of ergonomic problems, etc.

Being a new field of study, ergonomics will further raise such diverging opinions. Only after the practical application of this new discipline in industrial units, specific controversial problems might be cleared up.

In concluding the colloquy, Prof. Dr. I. Mihăilă pointed out that. in the future, psychotechnical tests will be accomplished in view of occupational selection, and short informatory lectures will be organized in the field of ergonomics. The Ministry of Labour will have the task of co-ordinating the research activities of all institutes and industrial units, in problems of ergonomics.

The two above-mentioned scientific meetings demonstrated that in our country a number of institutions and industrial enterprises have already begun to put into operation the fundamentals of ergonomics. Concomitantly, a contact between experts in a great variety of areas has been accomplished, succeeding to make a beneficial exchange of experience and numerous actions have been suggested in view of improving the future activities in ergonomics.

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