EMPLOYMENT PROBLEMS OF AUTOMATION AND ADVANCED TECHNOLOGY

AN INTERNATIONAL PERSPECTIVE

Proceedings of a Conference held at Geneva by the International Institute for Labour Studies 19 – 24 July 1964

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FOREWORD

THE International Institute for Labour Studies, created by the International Labour Organization in 1960, has a two-fold purpose. Through education — mainly in Study Courses provided for young men and women working in the service of governments, management and organized labour — it helps to train the leaders of the future.

Through research and the organization of seminars and conferences, it seeks not only to describe, analyse, and compare current practice in manpower deployment and industrial relations, but also to explore the frontiers of its chosen field. It draws upon the rich store of information, knowledge, and experience possessed by the ILO, but from time to time it also acts as a pioneer, venturing into territory not yet fully charted by the Organization. It tries to collect novel information and bring together experienced men and women from the scientific and academic world, as well as active leaders of labour and management, to think aloud about the implications of the data.

The Conference on Employment Problems of Automation and Advanced Technology, held in Geneva from July 19 to 24, 1964, was of this type. I am grateful to the United Kingdom and United States Foundations for Automation and Employment for having generously undertaken to meet the entire cost. Without this help and their collaboration in planning and organization, this international Conference, which brought together specialists and scholars from over 20 countries, could not have been held. Nevertheless, as in all Institute Study Courses, Seminars and Conferences, no person came as a representative; each spoke for himself and committed no organization by what he said.

Professor Jack Stieber, Director of the School of Labor and Industrial Relations, Michigan State University, spent the academic year 1963–64 with the International Institute for Labour Studies as a research consultant. He undertook the major responsibility for organizing this Conference and carried out the tasks of editing and preparing the papers for publication and for writing the introductions. I am grateful for his valuable and competent help.

Automation and advanced technology, with the aid of the astonishing developments of science during the last 20 years, may produce a second industrial revolution. This revolution has outstanding characteristics in common with the first. It will relieve men of heavy

labour ; it will greatly reduce the real cost of production ; it will create the potential of vastly increased and improved consumption.

The first industrial revolution was accompanied by widespread misery. If the second is not to do the same it must be looked at not as a looming disaster but as an opportunity. Perhaps it is well to remember that in recent years, almost all over the world, the number of consumers has been increasing much faster than the number of producers. For two-thirds of the world we are worried that mankind may not be able to increase production fast enough to keep pace with, let alone to exceed, population growth. Cannot advanced technology help us in this struggle? Is not that possibility the great opportunity of our time ?

The Conference on the Application of Science and Technology for the Benefit of Less Developed Areas, held in Geneva by the United Nations in 1963, published its report under the title *World of Opportunity*. It is in that spirit that this record of our discussions and findings is now made available not only to the International Labour Organization and all its member bodies but to scholars and scientists and to all who have responsibility for achieving the aims of the Development Decade.

GENEVA, 1965 HILARY A. MARQUAND

INTRODUCTION

BY

JACK STIEBER

FEW subjects have generated as much discussion and concern in so short a period of time as the social and economic consequences of automation. Equally significant is the broad range of people who have become interested in this subject, either because it touches directly upon their well being or for reasons of professional interest and intellectual curiosity. The unskilled industrial worker and the top-skilled craftsman, the shop supervisor and the chairman of the board of directors, the university professor and the practical businessman, the trade union leader and the industrial relations executive, the elected politician and the government planner: all share a common interest in the phenomenon called automation, a word which was not even in our vocabulary twenty years ago and still lacks a generally acceptable definition. Some of the reasons for the tremendous interest in the consequences of automation by such diverse segments of the population are evident from the papers and discussion in this book.

This volume contains the proceedings of a conference held in Geneva, Switzerland, during the week of July 19–24, 1964, under the auspices of the International Institute for Labour Studies of the International Labour Organization. Sixty-two participants were invited from universities, trade unions, business, professional practice, government, and international organizations. They came from twenty countries which differ greatly in wealth, degree of industrialization, and in their social, economic, and political systems. In some automation is well advanced both in factories and offices, in others it is in its infancy, and in still others this form of advanced technology has not yet emerged upon the industrial scene. In a few countries the labour force is still predominantly engaged in agriculture, while in others less than 10 per cent is employed in farming. Some are experiencing considerable unemployment and underemployment, while others have overfull employment and labour shortages. Some countries have had extensive experience with retraining programmes, worker relocation, and other methods of adjusting to technological change; others are only starting to experiment with an active manpower policy. In some countries

central planning is an integral part of the economic system, in others free enterprise and free markets for goods and services prevail, and still others are somewhere in between.

But despite their diversity in background and national environment, participants shared a common interest in the social and economic consequences of automation and advanced technology. They had been invited because of their experience, competence, and knowledge in the subject matter of the Conference and not as representatives of their countries or organizations. The purpose of the Conference was to permit a free and frank exchange of ideas and experience among participants, in order to increase knowledge and understanding of the employment problems growing out of rapidly changing technology. There was no attempt to arrive at a consensus or to reach conclusions, although the reader will find many areas of agreement as well as disagreement in the papers and discussion.

A brief note is in order regarding the title of this book. The term 'employment problems' is used, in its broadest sense, to include all aspects of employment and unemployment and the forces that impinge upon them. 'Automation' and 'advanced technology' are used more or less interchangeably and there was no attempt, either before or during the Conference, to arrive at an acceptable definition of these terms. It was left to the participants to define the terms in a way which was most appropriate in their own experience and for the problems under discussion. While this *laissez-faire* approach has certain disadvantages, it had the important advantage of not permitting the Conference to get bogged down in problems of definition ; too many conferences on the subject of automation have begun and ended without getting much beyond a sterile discussion of definitions.

The book is divided into five parts, each concerned with a major field of interest within the overall framework of the Conference.

Part I provides the setting for the ensuing discussion, directing attention to the following questions : How fast has automation been progressing and how rapidly may we expect it to advance in the next decade ? What industries have been most affected by advancing technology and what directions will this advance take in the future ? What are the best measures of the rate of technological advance and what are their limitations ? What factors influence the differential rates of technological advance among countries ? Taking Japan as a special case, what were the circumstances which permitted this nation to propel itself from a state of complete destruction and economic devastation to an advanced stage of industrialization in less

than twenty years ? Is the experience of Japan instructive for the less industrially advanced nations ? Can underdeveloped countries speed up the process of economic development by using modern technologies or should they employ more labour-intensive modes of production ?

Part II deals with the impact of advanced technology on the level and structure of employment and unemployment. It takes cognizance of the different context in which technological change is taking place in the United States and Western Europe : the one, a leader in the use of automation and advanced technology but experiencing a relatively high level of unemployment ; the other, an area in which most countries have full employment together with rapid technological change. What are the causes of U.S. unemployment and what remedies are prescribed to cure the problem ? What factors have been responsible for high level employment and high growth rates in Western Europe ? Why have some European countries lagged behind in economic development ? What employment problems result from changing technology in a planned economy and how are they dealt with ?

The final paper, in contrast to the economic thrust of the other papers in this section, is concerned with some important questions which are increasingly being asked by individuals caught up in the technological revolution : what does it all mean in terms of work and leisure ? If, as appears inevitable, people devote less time to work, how will they spend their leisure hours ? Does society have an obligation to educate individuals for leisure as well as for work ? If so, what kind of education should it be ?

Some answers are given and additional questions relating to work and leisure are asked in Part III which discusses education and training in an age of advanced technology. A British physicist gives his ideas on the kind of educational system that is needed for the world of tomorrow and the Rector of the Leningrad Polytechnic Institute tells how the Soviet Union trains its scientists, engineers, and technicians. In another paper, retraining, which is generally accepted as one answer — albeit a very partial one — to employment problems of changing technology, is examined from many angles : How much ? For whom ? What kind ? With what results ? At what cost ? Under whose auspices ?

Labour mobility in the geographic sense, has less acceptance than retraining as a way of adjusting to technological change. None the less relocation of surplus labour is being widely discussed and increasingly practised. But this is only one aspect of mobility ; there are others equally and perhaps more important in an age of

rapidly changing technology: interindustry, interplant, and inter-occupational mobility are also ways of adjusting to change. These are discussed in the final paper of this section.

Part IV is devoted to the impact of advanced technology on management at various hierarchial levels, from the men who occupy the 'executive suite' to the middle manager and the supervisor on the shop floor. How do the use of computers in business affect decision-making, organization structure, and managerial functions? Will more or fewer managers be needed, and at what levels? What kind of education and training will best prepare managers to function effectively in the modern business enterprise? What will be the role of the supervisor in an automated plant? Will democratic or authoritarian supervision get the best results? Are the functions and desired attributes of supervisors different in a profit economy from a planned economy? The papers in this section contain some interesting information on these and other questions.

Part V deals with the impact of advanced technology on collective bargaining, employee attitudes, and manpower policies. With regard to the United States such questions as the following are discussed: What changes have taken place in collective bargaining as a result of automation and advancing technology? Can the pressing employment problems generated by rapid technological change be dealt with through collective bargaining, and if not can the institution survive? How are union membership and structure affected by automation? What is the effect of advancing technology on unorganized workers? Who speaks for those who have become unemployed as a result of technological change?

As a rule collective bargaining has followed the well-known pattern of the union making demands and management reacting to them. What happens when the employer under pressure to increase efficiency takes the initiative and reverses the usual process by making demands on the union? The results in one case are analysed by a British industrial relations specialist. In the discussion which follows, participants speculate about the applicability of this case to other situations.

How are individual employees affected by the introduction of a computer? What changes if any take place in the objective conditions of work, employees' interest in their own jobs, and in the overall operations of the enterprise, attitudes towards supervisors and job satisfaction? To the extent that changes occur, are they permanent or transitory? Can management affect employee attitudes towards change? These are among the questions explored in a study of office automation in a large bank in France.

The final paper in the book is fittingly by an official of an international organization, the Organization for Economic Co-operation and Development (OECD), and presents the elements of an active manpower policy for the individual enterprise.

We are all creatures of habit and products of our environment. As such we tend to generalize from our own experience and national background. One of the objectives of the Conference was to combat this narrow parochialism by bringing together individuals with diverse professional interests from different countries. Similarities and differences in problems and solutions could then emerge which would cut across specific fields of interest and national boundaries. The extent to which this objective was realized can be judged by the reader from the papers and the discussion which follows. The papers in each part of the book are preceded by brief introductory comments.

The Appendix contains a background paper prepared for the Conference which summarizes the literature on the social and economic effects of technological change.

The editor spent the year 1963–64 in Geneva as research consultant to the International Institute for Labour Studies. As a temporary member of the Institute staff and a participant in the Conference, I believe I can speak for all those who attended in expressing our appreciation to the Institute, the ILO, and the American and British Foundations on Automation and Employment for making the Conference possible. I should also like to thank Mrs. Leonora Stettner and her assistant, Miss Conchita Jiménez, for preparing notes on the Conference discussions and Mrs. Margaret Henderson for editorial assistance.

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