COMMISSION OF THE EUROPEAN COMMUNITIES

CONFERENCE ON WORK ORGANISATION, TECHNICAL DEVELOPMENT AND MOTIVATION OF THE INDIVIDUAL

Brussels, 5-7 November 1974

The Report of the Conference, held in connection with one of the Social Action Programme's aims of humanising living and working conditions, reflects the organisation of the Conference itself. The general introduction is therefore followed by contributions from two eminent specialists in this field, one on the democratisation of work and the process of organisational change, and the other on work improvement and industrial democracy. The subsequent detailed discussions are then broken down into the working papers and reports of individual working groups.

Group I papers are concerned with the working life in European society and the rôle of industrial democracy in improving living and working conditions. Groups II and III reflect the conclusions of specialist seminars held in September 1974 dealing with white collar work, light and heavy engineering (group II), and working conditions and forms of work organisation in the European automotive industry, plus automation, industrial robots and artificial intelligence (group III). Group IV discussed the financial and economic aspects of job enrichment systems, while group V dealt with the problems of education and training.

In addition to the papers on the group discussions, there is a summary of the Director-General for Social Affairs' conclusions and suggestions for possible Community activities in the field.

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INTRODUCTION TO THE CONFERENCE ON WORK ORGANISATION, TECHNICAL DEVELOPMENT, AND MOTIVATION OF THE INDIVIDUAL

ORGANISED BY THE COMMISSION OF THE EUROPEAN COMMUNITIES

PRESENTED BY V. RAIEVSKI, HONARY DIRECTOR GENERAL OF THE EUROPEAN COMMISSION, BRUSSELS

I. INTRODUCTION

At the beginning of this Conference on improving working conditions, it might be useful to place this objective in the context of the activities of the Commission of the European Economic Communities, then to describe the organization of the Conference.

The EEC's objective is economic prosperity and a general improvement in the quality of life in the Member States. The methods of implementing this policy were defined in the Treaty establishing the EEC.

It is essential to understand that the EEC is not merely an internal market.

The Treaty (Rome 25.3.1957) comprises social provisions which specifically state as, for instance, in Article 117 of the Treaty, that the Member States agree "to promote improved working conditions and an improved standard of living for workers, so as to make possible their harmonisation while the improvement is being maintained".

These provisions were confirmed at the Conference of the Heads of State and Government held in October 1972 in Paris. They emphasized "that they attached as much importance to vigorous action in the social field as to the achievement of economic and monetary union".

In its Guidelines for a Social Action Programme presented to the Council on 18 April 1973, the Commission stated that the social policy of the Community should be regarded as a worthwhile aim in itself and not just as a means of counteracting the social ill-effects of economic progress.

The basic objective of the Community is therefore to improve living and working conditions.

Can this objective be challenged by the current economic situation? As an objective - certainly not. Economic progress must be considered as a necessary condition of social progress and not as an objective in itself. Can the recent economic crisis jeopardize or at least delay this objective? The reply comprises important subjective factors, e.g., the opinion that economic policy is in direct opposition to social policy; some of the experiments carried out with a view to improving working conditions will be described in this Conference; in most cases, this opinion was directly contradicted.

Our production apparatus must be thoroughly restructured in order to cope with monetary inflation and the rising prices of raw materials, particularly of oil.

Such restructuring, already started with the development of science and technology, will mean that our firms will have to be more innovating, more sparing in their use of raw materials and energy. Increasingly complex machines must be operated with greater efficiency and better maintenance. This necessarily involves the cooperation of the workers and thus their participation in the defining of working conditions.

More satisfactory and better motivated work organization is therefore an essential objective of the Social Action Programme while, at the same time, it is a means of maintaining productivity and competition in our undertakings.

II. UNSUITABLE WORKING CONDITIONS

That the working conditions stemming from the industrial revolution and founded on Taylorism have become unsatisfactory can be objectively assessed from the workers' dislike of industrial jobs, particularly of a manual nature. The lack of interest shown by the young in industrial trades and the high rate of instability in workers aged under 30 can be seen in most of the industrially developed countries, both in the West and the East.

Such disaffection cannot be ascribed solely to the wages problem, since in the USSR, for instance, a qualified labourer is better paid than most employees and often better than most university graduates. Similar situations exist in other countries, e.g., the USA, Switzerland, Sweden, etc.

The reasons for this disaffection are to be found in the actual working conditions. They are still only too frequently based on Taylorism, typically involving a lack of freedom and an authoritativeness which contradict the democratisation of public and private life, and a lack of interest and development prospects which contradict the aspirations encouraged by the educational systems and the role of the mass media.

These negative factors are cropping up more and more frequently in jobs in the tertiary sector which are slowly losing their privileged status. Even the decision-making levels are being attacked where executives, despite their hierarchical position in the firm, have little or no influence on the decisions which condition their vocational life.

In short, work organized on the basis of a mass of executors, dispossessed of ideas and merely carrying out a job, is no longer adapted to the level and aspirations of modern man or, indeed, to a technology which could be used more effectively with responsible workers in a different work structure.

For some time now, at the instigation of the trade unions, employers, sociologists and psychologists, considerable efforts though scattered and uncoordinated have been madè to remedy this situation. Increasingly stringent legislation has eliminated the most dangerous and unhealthy tasks.

Industry is attempting to improve its image by improving the general standards of comfort and organization of employment and by introducing greater freedom and scope for initiative.

Furthermore, the obstructing of university careers and the relative reduction of remuneration which results tends to reduce the gap due to the differences in basic training. The constant improvement and polyvalency in apprenticeships, the generalisation of permanent education and the probable introduction of recurrent education will further help to fill the gap.

We can see the first signs of the reversal of this trend. In certain countries, e.g., USA (1), Switzerland, Sweden (2), it seems that efforts made in certain industrial sectors are beginning to interest young people in industrial employment.

These signs are encouraging. One of the aims of this Conference is to see how firm, extensive and coordinated action, assisted by intensive exchanges of experience and progressive methods, can help to define an improved organization of work.

These experiments, however, are generally isolated and specific: they are valid for given local data and not easily extrapolated or disseminated. Information circulates badly and precious results are thus lost to those who could exploit them or profit by them.

These experiments, new methods, their effect on economic, financial, training and regional policy levels have not always been thoroughly examined or understood. One of the prime objectives of this Conference is to enable the innovators to meet and exchange information.

- Analyse the requirements in the field of the quality of life in employment in a society where the considerable changes are principally due to scientific and technical growth and, more recently, to a modified economic situation.
- Examine and compare the methods proposed and current experiments.
- Lastly, set up the bases of an action programme.

These are the objectives which the Conference has in view.

Action must be taken at the levels of the concept of the product, technology, work organization, and introduction of democracy into the undertaking.

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(1) See in particular the US Department of Health Report on Employment Problems, December 1972.

(2) Survey for VOLVO, SKÖVDE plant, October 1972.

Such action clearly affects all the fields of social and economic activity. We make no attempt to cover, in this Conference, all these fields, and have had to make a necessarily arbitrary subdivision.

III. ORGANIZATION OF THE CONFERENCE

The members of the Conference will each take part, according to their choice, in one of five working parties which will examine the following subjects:

- vocational life in European society;
- methods and execution (two working parties);
- economic and financial problems, management problems;
- education and training.

A certain number of the subjects for discussion were proposed. The subjects are not compulsory or self-limiting; they form a context, a guide, in which the Chairman, and of course the participants, with the Chairman's agreement, may put forward ideas, following the trend of their discussions. A rapporteur for each working party will introduce the subject for discussion. The rapporteur will contribute his own ideas and convictions. It will be the task of the working party to examine this report, comment, expand and enrich it with a view to the report which will consolidate and synthesise the subject and enable future actions to be outlined.

The role of the rapporteurs, Chairmen and Commission will be to draw conclusions from these discussions, and as far as possible, harmonize the various points of view or, on the other hand, to show as clearly as possible the differences which could have appeared.

These conclusions will be given in open session, thus enabling all the participants to discuss them and to obtain an overall picture of the Conference's work.

There will also be an open session at the beginning of the Conference in which Professors THORSRUD and TRIST will make general statements providing the participants with an overall view of the subject and enabling the working parties to begin their work more rapidly.

Lastly, you will be given information on the four specialized seminars which were held in Brussels on 17-20 September and which formed an integral part of this Conference.

IV. THE SPECIALIZED SEMINARS

It was not considered possible, in the three days of this Conference, to examine in detail and synthesise the problems and number of experiments being carried out in some industrial sectors. For this reason, it was considered necessary to hold special seminars before the Conference. These seminars, conducted by specialists in the fields covered, some of whom are also taking part in this Conference, resulted in consolidated reports which have been distributed and presented to Working Parties II and III to form a basis to their work.

The industrial sectors chosen are as follows:

- the motor vehicle industry. This sector is characteristic of mass production traditionally involving manufacturing and assembly lines. It was used as test bench by the scientific work organization. This is also the sector where social disputes have been very lively and widely disseminated to the public. Lastly, this sector has seen considerable efforts made both at the organisation level and in production techniques.

- The processing industry and heavy industry.
  The aim of this seminar was in particular to study the work organisation problems in the continuous production sectors where the processes are highly mechanised and automated. The discussions have, in fact, covered the subject in considerable detail.

- The services industry was the subject of the third seminar. It constitutes the tertiary sector which, having for a long time been a priviledged sector as regards employment

conditions, is now undergoing considerable change. This is due to the introduction of computers and a major increase in the number of staff. It is estimated that in the coming decades, over 50% of workers will be employed in the services. This sector is therefore essential to the future. New forms of work organisation must be found and implemented immediately.

- Automation, industrial robots and artificial intelligence are not part of a specific industrial sector. They correspond to the introduction of highly developed technology into the production system.

The discussions held in this seminar have shown that technology, in itself, does not define a favourable or unfavourable working condition. Technology is a major factor of the production system, it provides a wider choice of work organisations. This choice, however, must be carefully made in favour of the most suitable structure.

V. CONCLUSION

As we stated at the beginning of this report, the Community is taking extensive and long-term action to create living conditions at work which are no longer solely devoted to ensuring that the worker and his family are able to subsist, but which also provide a source of interest, enrichment and scope for achievement.

We are convinced that an irreversible process has now begun in the labour world: that the concept of fatality in bad working conditions is starting to disappear and that by means of well-planned, considered and constant action, we should provide the best conditions for the transition to what some consider as a new form of civilization.

DEMOCRATIZATION OF WORK AND THE PROCESS OF ORGANIZATIONAL CHANGE

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CONTENTS

I. SOME BASIC CHARACTERISTICS OF THE CONTEMPORARY INSTITUTION OF WORK

> "The institution called "work" in the industrialised nations has a long history as the central institution of society and has for long had a singularly monolithic structure. Work has been accepted as a duty and a necessity for most adults; work and workplaces have been designed almost exclusively with reference to criteria of efficiency and cost; technological and capital resources have been accepted as the imperative determiners of the optimum nature of jobs and work systems; changes have been motivated largely by aspirations to unlimited economic growth; the judgement of the optimum design of jobs and choice of work objectives has rested almost wholly with managers and technologists, with only slight intrusion from collective bargaining and protective legislation; other societal institutions have taken on forms that serve to sustain the work system".

These are concluding comments in a recent publication by OECD; Work in a Changing Industrial Society. (1) In this review of current changes and new trends in the organisation of work ten independent European and U.S. scientists come to similar conclusions: The institution of work as it has evolved in industrialized countries seems to be increasingly unsuitable to meet contemporary and emerging needs. That this is so, in terms of social and individual needs, is not a new observation; although it is only recently, as shown by the review, that alternative forms of work organisation have been developed systematically to replace traditional technocratic and bureaucratic forms. More novel and perhaps equally important is the observation that there are basic contradictions between the new forms of process-and information technology and the social structures maintained by contemporary industrial organisations, trade unions and educational institutions.

Mechanistic, scientific management and extreme functional specialization offered relevant solutions as long as mechanization was the basic principle of industrialization (, - and as long as improved income was the basic human need to be met). After the third industrial revolution this is not so any more, since automatic control and electronic information systems have become as important as mechanization. And, as the level of education goes up, the younger generation wants something more than money out of work. In particular they want to be involved in change itself. Therefore the capacity for change from within has to be built into the new forms of organization.

Viewed in this wider context, it is not surprising that employee participation in the management of change has become a burning issue in many industrialized countries.

In some countries basic organizational contradictions have been swept under the carpet for some time. International tension, economic instability and more recently the ecological threats have overshadowed the needs for social reorganisation. This has lead not only to apathy and conflicts in industry and education. In countries like the U.S., it has also paralyzed political life, since obsolete management philosophy and techniques have been transferred to government, social services and foreign affairs.

It was not accidental that the U.S. got itself entangled in deep conflicts at a time when specialists from industrial and scientific "think tanks" introduced management techniques in civil and military services at home and abroad (linear planning, program budgetting, computerized control systems, etc.). To change a twenty years old proverb slightly; "what is good for a business corporation is not necessarily good for a country". "The Sovereign state of I.T.T." (2) seems to have awakened the public in the U.S. as well as abroad. Industrial corporations which have for some time tried to develop a responsible social policy will now have to speed up their development of new organisational solutions. And they will have to do it in collaboration with trade unions and governments.

In some countries like France and Italy, dramatic events like the May 1968 revolt have shown that contemporary political systems are indeed in danger if the leading institutions of industrialized society remain unchanged. However, if these institutions are changed mainly by formal and sometimes tactical means from the top of established bureaucracies this will probably not remove the causes of unrest. It is the way in which changes are introduced and carried out which may be most important. And it will not be sufficient for established institutions to change on their own mainly for their own internal purposes. The interdependence between changes in industry, trade unions and government is critical in industrialised society. If one or more of these institutions considers itself to have only conflicting interests with the other institutions a dead lock seems to occur. In other countries a common platform for social change in industry has been established since the leading institutions have found that they have some major, overlapping areas of interest, although they

maintain the right to have conflicting interests in other areas.

The lack of institutional collaboration has different historical, religious and socio-economic causes in different countries. Time alone will usually not remove these causes. However, the relative importance of these causes may change when new threats or challenges from the outside require some degree of coordinated response from previously antagonistic institutions. This has been easier to realize for smaller countries which have been accustomed to adapt to external requirements over which they had little influence. Even in those countries which could dictate or bargain their external conditions the needs for internal social reorganization may now be critical. In countries where different industries have not been able to coordinate their interest or where the trade unions are split for religious, political and other reasons the new institutional contracts seem hard to establish.

In some countries like Great Britain, there has, perhaps not until recently, been sufficiently strong economical and technological reasons for institutional changes in industry. Even when such reasons were strong, the stability of the political system and of the public sector might have helped the industrial system to pull through. This might not be the case in the next few years. The Times of London recently summed up the situation in the public sector as follows:

> "A few years ago the idea of an official strike in the Civil Service or of a refusal to make arrangements to pay increased old age pensions, or of an attempt by local government staff to disrupt local elections, or of a strike by hospital workers that admittedly exposed patients to a degree of danger, would all have seemed equally outlandish. Yet all have recently occurred". (Editorial, Aug. 22nd 1974)."

Some countries are small enough and sufficiently integrated and they have reached a standard of welfare and social justice to make them suitable for experiments in social reorganisation of industry. It was not accidental that the Scandinavian countries and Holland pioneered in social welfare several decades ago on the basis of ideas often coming from other, larger countries. Over the last three years it has been interesting to meet one international delegation after another visiting Scandinavia to study organisational development projects. These projects were made possible because of some form of institutional contracts between unions, employers and government. They have aimed at organisational change and democratisation of work. More than anything else they have sprung from a common understanding of basic contradictions in industrialized society, - and a joint responsibility to initiate basic changes. The specific objectives and measures have varied from one project to another, but they have contributed to a common trend which gradually have made the term project or experiment misleading. (The content - what has been done in the projects - has been outlined by E.L. Trist (3) in a paper presented together with the present one).

The common understanding of the problems and the agreement on means and ends do of course not include everyone in Scandinavia. Some groups maintain that no basic changes are needed since the problems are justexaggerated by agitators. Some groups have reached the conclusions that reforms are impossible or detrimental since they will only prolong the life of a system which has to be replaced by a totally different socio-economic system. When foreign groups come to study democratisation of work in Scandinavia it is easy to observe the similarity between the series of problems they describe in their own countries and the ones which for some time have demanded joint action by the unions and employers in Sweden and Norway. (The main points in the following list were in fact formulated by the chairman of the Confederation of Norwegian Trade Unions five years ago). Before we discuss in some detail what it means to find <u>new ways</u> of democratizing work, the following characteristics of the situation in industry should be noted:

1. Highly <u>centralized organisations</u> are still the major building blocks of industrialised societies. The influence of the individual or the small groups, on local and the regional level, is weak. Public criticism against the large, centralized organisations are growing. This is particularly the case when they take the shape of multinational corporations. However, as stated by one of their critics, "If there is one thing more alarming to a small country than the presence of multinationals, it is their absence" (2).

2. <u>The split between work and education</u> has been widened and so has the gap between industrial policy and welfare policy. At the same time the cost of social welfare and of education is growing to levels where industrial and public bankruptcy, or tax revolts, may occur.

3. <u>The values of working people are changing</u> as affluence, at least in major sectors of society, grows. The ecologic time bomb and the growing gap between the rich and the poor

countries also become more threatening and influence people's priorities in life. Particularly the younger generation, with a higher level of education, demands something more than money and goods out of their working life. They demand meaningful work, in personal and social terms. They want to learn and develop, and to have control over their own work and their own life situation. They want to influence the process of change.

4. Authoritarian control or othermonolithic systems of control over people in work and education is no longer acceptable when a certain level of social welfare has been achieved. At the same time there are alarming signs that we have not created alternative forms of social control to take over. The more closely knit, traditional societies had such control built into families, the small work groups, the local community and the religious groups. The breakdown of social control in industrial society cannot be reestablished by simple measures called law and order. (The worlds of "Clock Work Orange", "Big Brother" or "Scientific Behavioural Control" are looming on the horizons.

5. Electronic information and communication systems, which promised to save us from routine work and to educate and cultivate us, seem to have quite different potentials as well. The number of people controlled by computers is growing while those who are in control of computer systems are few and often narrow in their specialist outlook. Mass communication, so far, seems to have contributed more to a passive, superficial and fragmented world perspective than to cultivation of knowledge and other human values. However, the new forms of communication can still be used for major improvements in the world of work and the world of learning, as well as in leisure activities.

6. Trade unions and professional associations have become fragmented and bureaucratized and taken on many of the same characteristics as the centralized economic institutions they were built to encounter. Lack of communication and participation in decision making, are felt also by union members. Established career privileges among the highly educated and highly skilled professions are also blocking new and more democratic forms of work organisation. This is particularly serious when the technologies underpinning many of the privileged professions are already obsolete. This is the case not only among technical specialists but also among teachers and professionals working in public and private services.

7. Specialist power is one of the major pitfalls we must avoid if we want to increase participation in the work organisation and improve the development of human resources. To remove the power of technocrats and give it to social scientists or other specialists in the same sort of roles would only be to exchange one evil for another.

II. FROM DEMONSTRATION PROJECTS TO DIFFUSION OF ALTERNATIVE FORMS OF WORK ORGANISATION

Already in the early 1960s, it was understood by a number of social scientists, industrial and trade union leaders that democratisation of work could not be achieved on a broad scale if traditional strategies of change were followed. If one looked at the problem as merely a scientific one, most people in industry would think of it in terms of experiments (like in physics and engineering) leading to specific results or solutions which could be copied when sufficient information was given to "users". There are two fallacies in the model. First, organisational experiments carried out under real industrial conditions are basically different from physical experiments. No conditions (or variables) can be kept isolated and constant. One is dealing with interrelated conditions under more or less constant change. Secondly, if the experiments are to become part of a democratic process, they can not be set up and carried out by specialists in a traditional way, and the results "handed out to those to be democratized". Consequently the strategy followed in the early Norwegian experiments was as follows:

(i) A joint national committee, representing labour and management, was set up to help define the problem area and advise on the research and development plans. This committee proved to be very important in the initiation and evaluation phases, and at some critical points of organisational change. It acted as an appeal body and a potential source of sanctioning when major issues could best be dealt with at a higher level than that of the experimental company.

(ii) The choice of experimental plants was done by the joint committee according to criteria suggested by the researchers. (Type of technology, size, location,

potential diffusion etc.).

(iii) A search phase involving company and union preceded each experiment. A general outline of company and environment was made and major problems analysed. The goals of the experiment were formulated in general terms as well as criteria to measure progress.

(iv) A local action committee was set up in each experiment representing workers (one of which a T.U. shop steward), staff and management. In the beginning of an experiment the researchers would be very active but gradually they would withdraw to become resource people and transfer the "ownership" of the experiment to those directly involved.

(v) Socio-technical analysis of the work situations and planning for change would be undertaken in collaboration between the action committee and specialists. (Examples given in paper by Eric Trist (4)).

(vi) A programme for change would be put into effect by the personnel of the departments involved, in collaboration with specialists and the action committee. (Redesign of jobs, systems of pay, - of communication and control, retraining of operators, supervisors, staff specialists, etc., changes in technology and operational rules, development of partly autonomous work groups, project groups, horizontal and vertical rotation of work roles, etc.).

(vii) Stepwise evaluation of change would have to be agreed on in advance and carried out against predetermined criteria by those involved in change - and by sanctionning bodies. (Joint union-management evaluation was essential).

(viii) Continued learning and organisational change were basic objectives of the experiments. This could not occur unless the stepwise evaluation of results became part of a policy making process on different levels of company, trade union and other institutions involved. (Education etc.). This would imply that lessons of the experiments were embodied in the philosophy of management and in appropriate organisational change. Likewise it would imply changes in what unions would include in their bargaining and how they would bargain (involvement by members).

(ix) Diffusion of results was assumed to take place as a consequence of the evaluation and policy making process. The joint national committee took major responsibility for diffusion. The educational service of trade unions and management associations were used for this purpose. A joint national council (T.U./management) took over the selection of new experimental companies and set up consultative services.

The research group was not supposed to take a major responsibility for diffusion, but rather to concentrate on new problems found to be important for continued organisational change and further democratisation of work.

The readers of this paper are probably now asking impatiently: What was really going on in these experiments? What was changed - with what results? In part III we shall give some details from one of the projects. Before we go into that let us briefly look at some problems of diffusion. These problems are important for understanding the process of change.

Experiences over five years have shown several weaknesses in the strategy outlined above. This became very clear when projects started in service organisations, in the merchant navy and in schools. Gradually the strategy was changed. A major problem is that a high degree of planned diffusion is a self-defeating principle. We have learned that when real diffusion takes place it does so in all sorts of unexpected ways which could not be planned or controlled. Perhaps the most important diffusion can be seen in a number of companies and local unions which never mentioned experiments. The same happened in different professional networks. They took the experiments and what they could learn from them as signals to move in a certain direction, away from something undesirable, towards something more democratic. However, at the time of the first experiments some plan was necessary to get protection and some free space within which learning could take place. Neither unions, managements or researchers felt free at an early stage of the projects to let loose all sorts of activities coming out of the local developments.

Another weakness of the strategy was that it established a relationship between the researchers, as specialists, and the field experiments which was not the best one for the diffusion phase. (A relationship which was useful to get the first demonstration experiments

going). This weakness appeared already in the way analysis of organisational problems took place - with researchers in a very active role, which was later difficult to change.

Those who were not directly involved considered the projects too much as pure, scientific experiments and the results as something which could be copied. It was also assumed by outsiders that one needed a great deal of research assistance (which was the case in the first demonstration experiments) to get new development projects going. Concepts used by the researchers initially, like partly autonomous work groups, either remained specialist "tools" or they were considered obligatory even in cases where they did not apply to local requirements.

A third problem was that some form of incapsulation took place in the experimental departments or plants. There were several reasons for this. One was what we could call the "glamour effect". Since the experiments got special attention, and for some time they got special resources to start the change process, they were often considered to get favourite treatment more permanently. This was on the whole not the case. Special conditions were granted only to match special contributions offered by the experimental group. Usually those who lead the way made great sacrifices to prove that something they considered right should be given a fair chance to survive and grow. Nevertheless, the pioneers would not have suffered too much if they had failed to prove their case. Initially, not many believed that they would. For those who came next the situation was different. If they failed they would compare badly with the successful pioneers. And if they succeeded there would not be so much in it for them, since others had made it before. This sort of competitive judgements were common among outsiders, where diffusion was to take place, although they seemed strange to those who had been involved. And when experimental departments needed adjustments in adjoining departments, or in services to support new phases of development, they did not often meet favourable responses. More proof was asked for, or unanticipated consequences were pointed out and used as arguments against further changes. This lead many experimental groups to consolidate their new forms of organisation on a certain level when development to new levels might have been desirable. Several experiments went dead because they did not lead to the necessary diffusion beyond the initial group or department involved.

In the early Norwegian experiments some special groups were particularly difficult to get actively involved. This was the case with supervisors who had worked for many years in bureaucratic forms of organisation, often squeezed between autocratic management and correspondingly tough unions. It was also the case with some groups of specialists and highly skilled workers who had achieved privileged status. The new forms of organisation based on a high degree of participation and autonomy did not at all make specialists superfluous. They did usually require specialist service on a higher level than before and they would offer in return to take over tasks which were marginal to specialists but vital for the operational groups to handle on their own. In some cases, when previously unskilled or semiskilled operators improved their lot through experimentation and learning, specialist groups demanded to maintain their higher status in terms of pay etc. without improving their skills or their contribution to joint learning correspondingly.

A final weakness of the strategy was that it took too long to trigger off the expected changes in the system of bargaining, necessary to support continued organisational change. (In most cases some changes were made in wage and salary systems etc. But the bargaining system was not necessarily changed). This might seem surprising since unions and employers' organisations were strongly involved. One explanation is that the major parties in the first experiments did not want to interfere too much. They withdrew for some time to let the experiments develop more freely. This distance made it sometimes difficult to learn what was really achieved and to see what was needed to be done also in the system of bargaining. Another explanation is that the major functions of the unions and the way in which tasks and responsibilities are distributed and carried out need to be redefined. (This would mean that unions need to reconsider their functionning not only as political institutions but also as work organisations). If, for instance, unions are bureaucratic and centrally controlled they will not be effective in supporting diffusion of such forms of democratisation as indicated in this paper. Some unions accept that they do have problems in these respects and are in fact beginning to learn how to change parallel to a democratisation of work and education.

What has been said for unions, as representing a problem for diffusion can be said for employers' organisations and governmental agencies involved in the bargaining of conditions of work. The basic point is that if the institution of work starts to change then related institutions will have to change as well. Or they may block change - or find themselves obsolete in a world of change.

Alternative strategies of change started to develop in Scandinavia, Australia and some other countries in the early 1970 s. One approach to be mentioned later is the "Participative design" of work and community life. (Emery & Emery 1974) (4). Another could be called "spontaneous diffusion", typically represented by development in Sweden since 1969. What happened there was briefly the following:

(i) Some common networks started to grow between Norway and Sweden in the mid-60s, among action researchers, trade unionists and managers. A common understanding of needs for democratisation of work and some new approaches developed.

(ii) When the two first (Industrial Democracy) field experiments had come under way in Norway similar systematic developments started in Sweden sponsored by a joint Council of Participation (T.U./Management).

(iii) In 1969, the report on the first four Norwegian experiments was presented publicly in Sweden and given considerable publicity. The Swedish Confederation of Employers and the Trade Union Council sponsored publication of the report and took active part in public debate of Industrial Democracy; different forms and approaches.

(iv) Both the major parties in industry started to inform their members of the recent experiences in democratisation of work. Employers concentrated on informing and activating professional groups. Trade unions gave general information to members and some shop stewards training.

(v) A great number of limited projects (and some extensive ones) started in a great number of firms in the early 70s. Some started with changes in job design, job rotation etc. Others started with new salary and wage systems and perhaps educational programmes, - others again with new types of information and communication programmes, sometimes linked to new bodies of labour-management participation. Methods of personnel management and "rationalisation" were changed to improve participation etc. The strategy was that whatever the first measures might be they could always be supplemented by new and complementary ones. The more extensive Norwegian and Swedish experiments were visited by numerous study groups.

(v) A flow of information, methods and people started to spread across companies and professional groups, educational institutions and trade unions.

This process of change in Sweden is in many respects open ended and likely to produce its own particular problems. The point is that any strategy of change will generate its own specific problems in the next phase. In other words, strategic choice needs to be considered after each major phase of change. If, for instance, the first phase is designed to produce demonstration experiments, then the strategy chosen may well turn out to be inadequate or detrimental to diffusion of experience. Further clarification of this basic point is given by P.G. Herbst in a recent paper (5).

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Impatient readers may wonder why so much is said about difficulties of diffusion and so little about what one wanted to diffuse. The point is that unless we understand what we want to change (1-7, end of part I) and unless we are aware of what we may be up against, the process of change may not take place at all in the direction expected by those involved. Let us now turn to a concrete case and explore what happened in a more recent project in Norwegian shipping.

III. THE PROCESS OF DEMOCRATISATION IN NORWEGIAN SHIPPING

The reasons for choosing this industry as an illustration are several. Many objections regarding the general validity of the earlier experiments could not be made against the ones in shipping. The technology varies from very simple to extremely complex in partly automated ships. The personnel range from unskilled labour with high turnover to very specialised professionals in stable career systems. In each ship jobs are structured on many levels (5-9) in three sharply defined departments covered by contracts with three or four different unions.

In 1966-67 the Work Research Institute carried out pilot studies in a few ships on request from different groups in shipping, mainly employers. The employers' organisation offered to pay for a study to find better ways of recruiting and training sailors. The researchers would not accept to undertake any studies unless: (i) The problem area was widened to include improvements in open and secure careers, changes in ship organisations as socio-technical systems and in ship culture (24-hour society). (ii) Sponsoring and sanctionning of development projects had to include employers, unions and relevant government bodies. This was accepted by all parties involved. The main reason for some of them to be involved was initially to enable them to sanction such changes which might threaten their established rights.

A phase of building trust between parties and a search regarding major changes in shipping and its environment took about a year. The researchers could predict that the active role they played in the search phase would cause some difficulties for diffusion. There would be resistance among people and institutions in shipping to take over the initiative and the "ownership" of projects (in a psychological sense). On the other hand a year was not a long time to build the necessary trust and joint involvement in a development process between the different parties. These parties were initially much more concerned with their distinctly different interests to be mutually respected than their partly overlapping interests in the changing conditions of shipping (markets - technology - education - social conditions etc.).

The researchers might have tried much more directly to get involvement by people on many organisational levels in actual changes on board ships. We could have left the overall problems for later clarification. Concrete changes could have triggered off a "participative design process" (4) if the selection of people to be involved had been right. But too rapid action could have been more than the National Contact Committee could tolerate at this point.

The outcome of the first phase of the shipping project was characterised by a certain level of joint involvement in problems which seemed to be too complex and too critical for anyone of the parties to manage independently: (i) In what sort of world transportation system would Norwegian shipping be involved? (ii) What sort of ships were to be built, manned and operated - with what technology and what forms of organisation? (iii) What sort of people would work on board ships - what education and career pattern would they have in the future and what would motivate them. Traditionally the first two questions could be answered in a reliable way for long periods of time. The third problem would sort itself out accordingly. In the future there would be no such simple answers to be found. The last type of questions (about people) might decide how to approach the two first types about technology (i) and markets (ii) as much as the other way around. This was indicated by the following issues which might fundamentally change careers, ship organisation and ship culture.

- Recruitment of young sailors and turnover of personnel caused fundamental problems in spite of greatly improved wages and welfare.

- A higher level of education among potential recruits and changing values among people raised new demands in terms of job content and career openings.

- New technology (mechanization, automation, systems of control and communication) raised new and rapidly changing demands for new knowledge and new skills.

During the pilot studies the researchers obtained insight into the special conditions in shipping as compared to other branches where democratisation projects had been carried out. Herbst outlined some important psychodynamic variables in an article which was discussed among sailors and shipping people (6).

During 1969 experimental preparations were made in one large firm for a new ship (combined bulk carrier with partly automated engine room) to start sailing early 1970. First a search process was started by a full time project group to map out the major changes the firm was confronted with and the special resources it could mobilize (technology, capital in a wide sense, organisation, human resources, institutional networks etc.). The project group consisted of one personnel staff member and three senior officers who volunteered to join the experimental ship. One research worker met in most of the group meetings and two others were less active resource people working on other projects as well. The project group first worked out objectives of the project, initially by stating what developmental trends should be avoided. Recent tendencies to introduce scientific management techniques and centralised control in shipping firms were stated as undesirable. Likewise the recruitment of specialists with privileged access to senior rank. Safety was stated as the most basic criterion for

evaluation of organisational improvements. Concrete changes in working and living conditions on board and in ship-shore relations were suggested to release human resources and create a more democratic climate. Economic and technological criteria for evaluating new forms of organisation would not be neglected but would be balanced against social criteria. (Six psychological job criteria were used as examples).

After exploring alternative actions to be taken and visiting other groups involved in development work the project group presented its action plan to the firm and to the shipping Contact Group (with representatives of four unions, three governmental agencies and the employers' organisation in shipping). The following experimental conditions were listed:

(i) A core of combined (deck-engine) crew to be recruited and trained.

(ii) Decentralized planning of work and maintenance, monthly and weekly planning meetings and a planning board to involve total crew.

(iii) Supervision based on self-control. (The role of bosun and ship mechanic could possibly be integrated into multi-purpose work roles for the sailors).

(iv) Budgetting (annual basis) and reporting to be simplified. (75% of all standard reports from ship to shore were to be dropped).

(v) Stabilizing crew by new type of permanent contract, holiday plans and replacement to be worked out on board ships.

(vi) New training programmes on board and some linked to holidays ashore.

(vii) Improved equipment and training for rescue and fire-extinction.

(viii) Equalizing living conditions; common dayroom for all on board, including a library, bar etc. (Construction of the new ships had preceded too far at this stage to make fundamental improvements in cabins etc. Common mess room and bathrooms in all cabins were planned for the next experimental ship).

During the last six months of 1969 the leading officers in consultation with the project group were given great freedom to put into effect their plans in collaboration with specialists and different departments of firms. Early 1970 the ship went to sea.

During the first six months of its sailing the experimental ship went through some drastic phases. After stepwise recruitment of officers and remaining crew the last group of rank and file had come on board a few weeks before sailing started. Delays in the shipyard postponed sailing and information and training became too theoretical since the ship was still in harbour. Newcomers who had not been involved in planning and preparatory work felt that they were forced into new ways of working and living on board without being able to judge the practical consequences. Bad experiences over the last few years with technocratic rationalisation made them sceptical of all changes. The flow of communication was blocked during the first month at sea and distrust between different groups started to grow. For some time the common dayroom and some new work planning and integrated crew working on deck were the only positive consequences the majority of participants in the experiment could see. To "rescue" the experiment the staff member of the project group and a researcher joined the ship, the former to replace an engine officer, the latter as a neutral resource person who could advise on improving communication and problem solving. Some confrontations between different status levels and deck-engine departments took place and some adjustments were made in the plans for change. Gradually involvement in joint problem solving started to grow, some training programs began to improve and broaden working skills and understanding of organisational change. The new work planning was integrated with multi-skill training. Increased responsibility was taken by crew to control their own work, to keep routines and equipment "shipshape". All groups on board were involved in planning holiday and other replacements and in changing the system of overtime compensation. Some degree of self-selection took place, - although the ship never had an "elite crew". The bosun and the specialist mechanic were exchanged with "combined" crew members. Positive progress reports were sent home but did not impress the National Contact Group before the captain at the request of the total crew met personally to discuss preliminary results after one year. The evaluation made by the crew was indicated by the fact that the large majority now wanted to return to the ship after holiday. (After two years 19 out of 25 wanted to return; three were staying ashore to continue their education and one of the mess girls to have a baby.)

The first phase of experimentation and learning had lasted about six months before a phase of consolidation started. When this new phase had lasted another year the core group on board was ready to move ahead again and started to prepare a proposal for a new manning system. They wanted a smaller and fully integrated crew to run the ship during its long voyages and an extended service system to take over part of maintenance during stay in port. (The crew of modern ships get very little time ashore during unloading and loading). When captain and chief engineer went home to present the proposal to the firm and the Contact Group it was judged to be too radical. Objections were dealt with by pointing out that they had already been considered on board and alternative organisational arrangements had been planned to meet various operational conditions. The experimental ship had to accept that it was too early for institutions ashore to accept the testing out of a new policy initiated by the seafarers. Shortly afterwards another experimental ship was permitted to try out a similar scheme with success.

After two years at sea the new forms of organisation had clearly been consolidated on board and in relation to the offices ashore. Members of the Contact Group visited the ship and the overall evaluation was unanimously positive. Several members had clearly dropped their opposition against certain measures to equalize conditions for different status levels, to decentralize control functions and integrate part of the work previously split between deck and engine. The atmosphere on board was judged to be exceptionally open and democratic. The evaluation by management of the shipping company was expressed by its preparations for launching a second experimental ship. The new experiment was supported by Contact Group and government agencies dealing with safety, social welfare and education. In this case major technical changes could be made and a new form of "matrix organisation" could be tested. (Some officers were trained for multiple roles to improve integration on officer level. They were qualified to carry several "hats" in primary and secondary roles which could be exchanged according to needs).

The evaluation of the first ship experiment made by the researchers in their report at the end of 1973 (7) stresses the self-maintained learning and development process on board. It also points out the learning taking place in the shipping firm and in organisations represented in the National Contact Group. The learning seemed highly dependent on those involved formulating their own objectives and the relevant measures to reach them. When integration of deck and engine departments was judged by the latter one to have been enforced without proper participation it was agreed to move one step back. When engine officers had made progress with a particular training programme developed on board, integration could move forward again. When the whole crew had joined partly on spare time, to rebuild the dayroom and to change the self-administration of bar service, this added to the common "ownership" and an open atmosphere in the area of social activities. Participative work planning across departments increased when each department had agreed on who should represent them on planning committees. Control of work performance was mostly changed to self-control as soon as simple training schemes started to be part of daily routines. Since junior officers were less involved in joint planning and training they saw only minor advantages in the new system, although they enjoyed the improved social atmosphere. When all crew members got keys to stores and toolrooms and their own tool kits as well, maintenance routines improved. The ship was judged to be exceptionally well kept technically. The firm never insisted on purely economic criteria used to evaluate the experiment. However, the core group of the experimental crew did, and results were among the best among eight similar ships.

Incapsulation of the experiment was about to take place in the shipping firm at one point. Six months had passed after the launching of the ship and the new forms of organisation were about to be consolidated. After a confrontation between the project group and operational management the former withdrew and the latter took full charge together with the people on board. Operational management felt that it had to be responsible for the new philosophy of management involved. To get a full acceptance of the new philosophy within the total shipping firm turned out to take considerable time and effort in spite of top management support. It seems as if real diffusion could only take place among people in departments which were themselves directly involved in development work along the same line as the project. Diffusion to two older but similar ships in the same firm was on the whole not a success. Core groups of crew were invited to learn from the first ship whatever they wanted and what they found relevant to develop their own experiment. They never did to the extent that self-maintained learning took place.

A most interesting evaluation of the first experiment was made by the captain of the ship three years after its initiation. (By this time he was spending a period of study in college). He first commented on the research report that it did not reflect correctly the fundamental change in autonomy and responsibility of people on board. This, he felt, could only be

understood if one had experienced the changes taking place in the way people treated each other and respected each other. "Now they are individuals with names while previously they were labour force".

He also pointed to the fine records on health and safety. "The major error we made was to go on board with "a readymade package" which naturally met resistance from those who had not been involved in making it up. If I were to start over again I would just start with the basic idea and a rough sketch. On this basis I would try to get involvement from people on board and let them develop their own solutions. In the future I think every ship needs to be like a project".

Another interesting evaluation came from the chairman of the National Contact Group in 1974. (A former sea captain). On behalf of his union he had visited 40 ships in foreign ports. The first experimental ship came out on top of his list in his overall evaluation. In his view no other ship matched it when level of technical and operational capacity was judged jointly with its organisational adaptability and the human atmosphere on board. He reminded the Contact Group that the crew was still wondering why they could not be given freedom to try out its proposal for a new manning system linked to a special service system in some ports. (- Since this would boost developments on board and not affect safety or economy negatively). A representative of the governmental agency responsible for manning and safety regulations stated that such a proposal would now probably be accepted since similar arrangements were now practiced in other experimental ships.

After the first ship experiment the researchers had good reasons to reevaluate their own roles. This became more evident as we had by this time also learned from our first experiments within educational institutions. This we shall return to in the last part of this paper.

Diffusion from the democratization projects in Norwegian shipping started already while the pilot studies were carried out. Typically the first field work was arranged in a shipping firm which had become interested in the early experiments in industry. The report from the field studies in 1966-67 was presented in several meetings with leaders of shipping organisations of seafarers' unions as a contrast to a report from a rationalisation consulting firm. The shipowners' organisations as well as unions accepted the pilot study report as a basis for a long term collaborative research and development programme. Both groups pointed out that technical rationalization had in many cases been carried out in undesirable ways to achieve reduced manning on board without simultaneously considering related organisational and human conditions. The shipowners' confederation launched a programme of socalled project ships. These were in some cases rather limited in scope, but in other cases they developed into extensive and integrated projects with social as well as technical and economic motives. Researchers from the democratisation project took part in a number of seminars where ideas from the first experimental ship were adopted in a great number of project ships.

Ideas from the first ship experiment also spred into the educational and training programmes of seafarers. The chief educational advisor to the shipping organisations had done some consulting work in the Industrial Democracy Project and also became secretary of the National Contact Group for ship research. When a governmental commission presented a completely new system of education for seafarers in early 1974 the basic ideas from the first ship experiments were included (secure and open careers, equalization of educational opportunity improved basic education with increased choice in terms of educational content and different phases of practical and theoretical training).

An important diffusion of research policy took place from the industrial and shipping democracy projects through the Norwegian Council for Scientific and Industrial Research. (By far the largest research). A large part of the Council's money was reallocated from purely technological research to problem-oriented social research. Most important was probably the involvement of social scientists and their partners from ship experiments in several projects on ship design, safety, etc.

Diffusion in seafarers' unions started mainly through the Contact Group and later to some extent in the form of union shop steward training. (Only one of the seafarers' unions are member of the Norwegian Confederation of Trade Unions). The main diffusion in the unions, so far, has taken place when their representatives have met in consultative and other committees with governmental representatives working on educational-, organisational- and welfare problems. Several confrontations have taken place, mainly between navigators and engineers, and will certainly do so in the future.

The planned diffusion from the first ship experiment to similar ships in the same firm was slow and did not turn out to be effective. Although copying was warned against, this occurred when isolated measures were introduced without being part of an integrated learning process, based on participation by everybody concerned in all phases.

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Reviewing our experience over the last twenty years Herbst (5) in a recent paper on work democratisation projects summarizes the following points regarding diffusion:

1) Strategical choices are found to exist at each stage of the process, which shows that the diffusion process does not proceed in an automatic and predictable way after the demonstration stage.

2) The type of strategy chosen at any one time may have consequences which do not become apparent until a later stage. Specifically, the type of strategy which may seem to be optimal at the demonstration stage can be counterproductive during the diffusion stage.

3) Prolonged time should where possible not be spent in the single demonstration experiment stage in order to avoid the consolidation of encapsulation processes which may become difficult to reverse later on. I do not think that we could have done very much better with this in the initial experiments in industry as a prolonged learning period was needed both for the firms involved and for the research team. However, as far as the more recent projects are concerned, the indications are that the strategy appropriate for diffusion should be adopted as soon as this becomes possible, by extending single demonstration sites to an appropriate network of two or three units.

4) The aggregate structure of the total system if this exists, need not be taken as a given. Instead the transformation of the aggregate structure can become part of the strategy, by activating networks which may change over time or later on subside and thus alter the characteristics of the diffusion process.

5) In the spread of technical innovations, imitation and adoption of a ready made solution may sometimes be possible. However, in socio-technical changes, where the starting off point is initially only partly known and what is aimed at cannot from the start be completely specified, imitation of a ready made solution may not only be inappropriate but may also inhibit the diffusion process. The same type of problem will face the researchers if he adopts or allows himself to become manoeuvred into the position of an "expert" who lets his past experience and theory obstruct his perception of the nature and characteristics of the situation in which he finds himself. In learning, what is difficult and problematical is not so much acquiring knowledge but to put aside what one thinksone knows. In order to help otherstо do this one has to learn to do this oneself.

6) The characteristics of the diffusion process depends on the structure of the total system. In going from manufacturing industry to shipping to education it is not simply the nature of organisations, their tasks and technology that differ, but individual organisations are embedded in a different total system structure. Thus, in manufacturing industry there is a considerable variety of operations and technology, of markets, of links to the labour market and training requirements, of links to the local community and in the history of the firm. Overall there are generally few if any direct links between firms (as long as they operate as independent units). There is in Norway a strong central trade union. Within the shipping industry there is far less variety in type of operations and markets. Selective cooperative links exist between individual firms and are also more marked at the national policy making level. In this system where individual firms are generally well informed of what others are doing, demonstration experiments are more highly visible. Unlike manufacturing industry, the shipping industry is governed by detailed laws and regulations affecting both ship design, ship personnel and operations. There are several relatively weak unions with partially conflicting interests.

7) It took almost 20 years to get from the initial to the diffusion stage in the manufacturing industry project. In the subsequent shipping project this took about 5 years and in the education project which is the most recent one, this took about 3 years. Within Norway diffusion is at present more rapid in the more recently started projects. It need scarcely be pointed out that these differences cannot be accounted for simply by learning within the research team.

The learning of the researchers will be summarized in the last part of this paper.

IV. THE ROLE OF RESEARCHERS IN DEMOCRATIZING WORK

This issue will be treated in this paper by summarizing some practical experience. (Further analysis is given in other publications (8) (6). Perhaps the following points will convey a general opinion: We have not found academic institutes and their research roles particularly democratic compared to the new forms of work organisation and collaborative research relationship tested in the projects discussed in this paper.

(i) During the first search phase, with appropriate analysis of the situation the researchers can initiate a basically undemocratic work relationship by imposing upon the collaborating parties a traditional specialist role. He can easily slip into the habit of interpreting symptoms and problems to fit his own theories and values. (To look for a problem that fits his theory). Since values are involved in all phases of a research and development programme it seems best to try make them explicit. (As was done in the Norwegian democratisation projects in terms of objectives, possible measures towards certain ends, certain ways of achieving and evaluating change etc.). It is our experience that extensive philosophical statements help less to make values of researchers and others clear than the concrete ways of collaborating and the slow process of building trust. (The research contract including rules of information and publication will also help to make values explicit. How is sanctionning organised etc.?)

(ii) The methods of research and analysis will strongly influence the relation between the research and other parties involved. The widespread practice of administrating large questionnaires to people in situations which the researchers know very little about is both unscientific and unethical. (Social scientists - and students - would benefit from answering long questionnaires made up by people who know very little about scientists and students). Quite often the researcher may find that there are already valuable data available in the organisation of basic importance to understand the situation and to be used in evaluating change. To get people on shop floor, in service and managerial roles directly involved in socio-technical analysis, as early as possible, has turned out to be effective. (- Both to learn what problems exist and which ones are most relevant to those involved. The socalled "deep slice technique" in participative design projects in Australia has turned out to be effective particularly to get involvement and establish the ownership of the project where it belongs (4)).

Direct involvement by workers and staff in the research work does of course not relieve the researchers from applying methods requiring scientific knowledge and skill. However, methods must be chosen to fit the problems of the situation (and not the other way round).

(iii) The dependency between researchers and collaborating parties will change over time. The "ownership" of the project is definitely not defined only by the financing and sanctionning system - although these aspects are important. In the type of action research described in this paper the researcher is neither the "servant" of one or more organisations, nor is he a privileged academician. We have found that such research is difficult to establish from inside the traditional university (which has different primary tasks). Likewise, the traditional applied research unit is not suitable (since it usually operates on the basis of a model of first having an established theory and then applying it to achieve specific changes. In our case new theories and methods come out of a stepwise change project).

A difficult problem for the action researcher is to be active enough during initial stages (to help get a process of change started without creating an undue dependency upon him by the collaborating parties. In some cases it can't be avoided and this will inevitably create problems in the diffusion phase.

In this phase we have found that the researcher cannot (and probably should not) push the process. What he can do is to help identify major obstacles and help to remove or reduce them. The obstacles are often integrated parts of the old form of organisation which are subject to change. Quite often they may exist outside the organisation and this may require the researchers to establish participative relations with new networks of people and institutions. This may in fact often be the most effective way of helping diffusion to take place. This seems to be illustrated by the recruit projects in education (9). This may in fact open new processes of democratizing work.

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WORK IMPROVEMENT AND INDUSTRIAL DEMOCRACY

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CONTENTS

THE SITUATION

The Nature of the Problem.

In advanced industrial countries people in increasing numbers are becoming concerned with the substitution of new ways for old in the world of work. These ways include participant management styles, trans-bureaucratic organisational forms, systems of shared control and principles of job design which create work which is worth doing for its own sake. Such ways imply new values. A new work ethic is, in fact, beginning to emerge which, if western societies are to continue to flourish, must gradually replace the old work ethic in which work, however distasteful, is accepted simply as a moral duty and an economic necessity. Note that it is a new work ethic which is called for, not a non-work ethic.

This new work ethic is concerned with the quality of life in the work place as a central part of the quality of life as a whole. Quality of life is the key emergent value which members of advanced industrial societies are coming to seek. Such societies have learnt to produce a volume of goods and services which permits a level of material well-being beyond the reach of the majority of the population until relatively recently. Even if the resulting affluence were shared with more equity than is the case in most western countries recognition grows that this would not in itself meet the rising demand for more satisfying and fulfilling work experiences.

There are two choices:

(i) to leave the vast bulk of jobs that must still be done in manufacturing and service industries in the dull and monotonous state in which they exist at present, accepting the need to work as the primary curse, a necessary evil which we must endure; the principal aim then becomes to reduce the amount requiring to be done, shortening both working hours and the working week, while maintaining a scale of pay which enables satisfactions to be sought elsewhere.

(ii) to redesign jobs and organisational forms so that the majority rather than merely the privileged few can do work which is meaningful and fulfilling, while a high level of performance is simultaneously maintained.

The people in any advanced industrial society must decide in which of these two ways they want their societies to develop. No doubt some mixture of both will continue, but unless the prevailing choice favours position (ii) rather than position (i) the evidence gathers that increasing work alienation will produce a serious deterioration in the quality of life both in and beyond the work place. There is a limit to the extent to which simply more leisure can compensate for a negative work life. A richer life in the work place strengthens capability to enjoy a richer life elsewhere. Continuing impoverishment of life in the work place diminishes this capability. Alienation has been increasing in the postworld war II decades, especially among the younger generations whose expectations and experience are different from those reared under scarcity conditions when economic rewards were paramount. Attitude surveys in several countries indicate that only the older worker continues to be willing to trade off dehumanizing work simply for good wages and employment security. The younger worker expects both these latter but seeks in addition, and increasingly, a job worth while in itself.

Fortunately, a number of pioneer projects have shown that by re-designing work conditions may be brought into existence under which high levels of job satisfaction and high levels of performance can be simultaneously achieved.

The Scope of Management, Union and Government Involvement.

The United States has been slower than some European countries, such as Norway, Sweden and Holland to recognize work alienation as a rational problem. In the last three years, however, a considerable change has taken place. The media, both the daily and weekly press and the television and radio networks, have given it repeated attention, particularly since the Lordstown strike at the newest and most automated of General Motors assembly plants became a public symbol of what young and disaffected workers are likely to do. On the Democratic side Senator Edward Kennedy held hearings on work alienation in the Senate in July 1972, while on the Republican side Senator Charles Percy, a former industrialist, has made a series of far-reaching statements. In December 1972 the M.I.T. Press published the Report of a Special Task Force to the Secretary (then Elliot Richardson) of the Department

of Health, Education and Welfare entitled "Work in America", which has become a best seller. In the fall of 1973 no less august a body than the American Assembly, an institution created while President Eisenhower was Chancellor of Columbia University, held a forum for prominent figures in industry, the trade unions and government on "The Worker and his Job". The subject therefore, has reached a stage very far beyond that where interest in it is restricted to the academic world. Moreover, also in the fall of 1973 the United Automobile Workers made proposals concerning the humanisation of work in negotiating new contracts with Chrysler and General Motors - the first time such proposals had featured in the bargaining programme of a major American trade union.

If concrete steps to create more satisfying jobs have so far been sporadic, a public consciousness is being created which is rendering such efforts easier to undertake. Their number is growing in consequence, if still limited. A forward step scarcely possible, had not some public consciousness been created, was taken in 1973 when a Congressional Commission on Productivity added the words "and Work Quality" to its title and launched a programme to bring into being some 20 demonstration projects involving participation and work restructuring both in key industries in the private domain and key organisations in the public domain. These projects must be jointly agreed and steered by the managements and trade unions concerned, with a guarantee that productivity gains will be jointly shared. This programme has been substantially influenced by the Parliamentary Commission on Industrial Democracy and the National Participation Council which arose out of the Norwegian Industrial Democracy Project and the joint programme of the Employers and Trade Union Confederations in Sweden. The main projects in Norway and Sweden have been repeatedly visited by American industrialists and by union and government officials.

For a time Congressional funding of the Commission was discontinued - productivity as such did not appeal to organised labour - and the first three or four work improvement projects have proceeded under the auspices of the National Quality of Work Center, an independent agency in Washington, affiliated to the Institute of Social Research at the University of Michigan, supported by the Ford Foundation and grants from various Federal Agencies. After an initial period for exploration, half the costs of these projects are borne by the firms or agencies concerned, with at least a nominal contribution from union funds, while the other half is borne by the Center. A special feature of the programme is the independent evaluation of all projects by a research team from I.S.R.

Now the Congress has re-funded the National Commission on Productivity. Still more emphasis will be given to a Work Quality Programme in which a good deal of attention will be paid to the public sector and the service industries.

At the State level a Work Quality Center has recently come into existence in Ohio, linked to the Governor's Business and Employment Council, with two projects jointly supported by management and unions, one in private industry and the other in the public services of a city.

At the Municipal level an initiative has been taken by a small manufacturing town in upper New York State, the City of Jamestown, where a Jamestown Area Labor-Management Committee has been formed originally to improve industrial relations but more recently to develop quality of work projects in its member firms which include all the main plants in the greater urban area and their respective union locals.

Meanwhile, in private industry the number of firms undertaking projects aiming to improve the quality of working life has been increasing, however small their number may be in relation to industry as a whole. From being hole-and-corner experiments quite a few of these now involve the total conversion of conventional plants to a plant-wide form of innovative work organisation and the installation of entire new plants designed on the new principles.

Until very recently most American endeavours were in non-union plants, where they were easier to pursue in view of union suspicion of such ideas. In some cases the management motive was indeed to keep the unions out. Several consulting firms in fact now advertise a service which purports to accomplish this end by means of management-controlled job enrichment. This, however, is becoming more difficult to sell now that some parts of the American labour movement show signs of becoming involved.

Another characteristic of early American endeavours has been the tendency of the firms concerned to keep the results of their change experiments to themselves. They have feared loss

of comparative advantage. This has made it difficult to ascertain the real extent of this kind of endeavour. But it is undoubtedly greater than appearances would suggest. With the extensive public attention of the last three years this posture is now becoming more difficult to maintain. A sentiment is beginning to arise that the methods used and the experience gained should be shared in the common interest, a view reinforced by the government, foundation and university programmes described.

The major pioneer endeavours involving leading firms in Norway such as Norskhydro and in Sweden such as Volvo and Saab Scania are so well known that they will not be dwelt on at this point. More recent developments, however, will be noted. In Norway these have centred on the shipping industry vital to the country's economy. There had been a breakdown in the occupational ecology of going to sea. Enough good Norwegians would no longer become seafarers under the conditions prevailing. Southern European crews with Norwegian officers failed to provide a workable alternative when large bulk carriers with sophisticated technology had to be manned. There are now a number of experimental ships afloat where deck and engine room roles are interchanged and where the social distance between officers and crews has been reduced. There is even an "all officer" ship. These developments will be referred to again in a later section. Let it be mentioned here, however, that they have been closely studied by the Maritime Commission of the American Academy of Sciences who have recommended intensive research to determine their applicability for the re-development of the U.S. Merchant Marine, now regarded as a critical issue.

In Sweden between 500 and 1000 work restructuring projects, some rudimentary and some advanced, are known to the Employers and Trade Union Confederations. Interest has now turned from manufacturing to white collar service industries. A comprehensive project is proceeding in Skandia, the largest Swedish insurance company. A similar project has begun in one of the main Norwegian banks.

This interest in white collar industries is echoed in the United States, where the Chase Manhattan Bank and the Travellers Insurance Company have done something to enrich clerical jobs though on narrow lines. A National Agency to focus on the white collar worker has been established in France.

The original experiments which sought to effect systemic change in work organisation were undertaken in Britain in the early 1950s. Though these did not continue, they affected a wide development in Norway which in turn influenced later projects in Shell (U.K.) in the mid-'60s and in Sweden towards the end of that decade. I.C.I. is another leading firm which has undertaken an extensive programme largely under American influence. But these promising British developments have not been well sustained in the '70s. A tripartite committee involving government, employers and trade unions has recently been formed but has still to launch an effective programme. The mutual distrust between management and unions is currently running at a dangerously high level and this countervailing trend is apparent also in several other European countries - more so than in the United States.

While quite a number of work improvement projects are proceeding in Holland (one of the oldest and most comprehensive being in the public sector in tele-communications, others more recent are in Dutch based multi-nationals), little concrete activity is known so far to have begun in West Germany despite the tradition of co-determination. The Federal Government has nevertheless recently shown interest, having commissioned an analytical survey of work in this field. One or two American-based multi-nationals have projects under way in their German affiliates.

The multi-nationals would seem to have a special role in diffusing the new work culture and the ethic and forms of work organisation associated with it. Developments among them seem to occur first in affiliates in countries where generally favourable conditions exist for promising efforts. They are then taken up by affiliates elsewhere. A case in point is Australia where a number of affiliates have undertaken substantial work improvement projects under the influence of Dr. F.E. Emery, who has also helped the Commonwealth Civil Service to move in this direction. The South Australian Government seems to have taken the entire public sector further along this road than anywhere else.

Until recently Canada was ahead of the United States in work improvement projects. A leading firm such as Alcan has for several years been developing substantial programmes in aluminium smelting and fabrication. In Ontario an attempt has been made to introduce work improvement into the Provincial Civil Service.

Advanced industrial countries with small but well educated populations, established

traditions of democratic government and basically stable industrial relations, have so far led the way in bringing a higher quality of life into the work place. This may be not unrelated to the closeness of overlap in the networks formed by key individuals in such countries which allows the value-base to change more quickly, once a development begins to take place which is experienced as congruent with the social future envisaged. Moreover, these countries have become industrialized later, more humanely and with less conflict than certain older and larger European countries. At any rate what has happened in Norway, Sweden and Holland, echoed as it is in Australia and to some extent in France, Germany and Britain where the change-over is proving much more difficult to initiate and sustain. Similarly with the United States.

Discussion of the emergence and spread of the Quality Control Circles in Japan will be deferred to a later section. This development, now extensive, has proceeded on very different lines and on a very different cultural background from any of the developments in Europe and North America. But its existence, in addition to these, shows that a new concept of work, whatever form it may take, is emerging to some degree in all advanced industrial countries, though it is still a minority trend.

It might be supposed that the recent energy crisis (with other shortages to come) together with rising inflation could arrest this trend. Doubtless attempts in this direction will be made by those (and they are still the majority) who are out of sympathy with the new work ethic and the organisational forms and modifications of traditional managerial and union practices which go with it. But there is another side to this, which has been cogently put by Jerome Rossow of Exxon (1) in introducing the papers of the American Assembly:-

> "The energy crisis has created a new urgency for change at the work place. Today the human side of the enterprise looms as a critical factor in the accommodation of industry to a period of scarcity. Shortage of energy, of materials, and of equipment are evident. The major hidden resource is the untapped human potential of the work force within each organisation in our society."
>
> "At this time of rising unit labor costs, general inflationary pressures, and the need to remain competitive, companies must turn to their workers to achieve the adjustment effectively. Greater humanisation of working life can be advanced in concert with measures to increase productivity, reduce waste, and increase the conservation of energy and materials. The key element involves the active participation of workers at all levels in these mutual goals".

From such statements and the scope and depth of the endeavours through which a new concept of the work place is emerging throughout the industrial world, it may be inferred that this trend, though not yet a swelling tide, and having still to contend with major opposition and deep resistance, can scarcely be written off as a passing fad creating a market for contrived consultant packages. Rather does it represent a basic value change connected with the transition from industrial to post-industrial society.

THE CHARACTERISTICS OF THE OLD AND THE ORIGINS OF THE NEW CONCEPT OF WORK

The Old Work Ethic

The old work ethic has become embodied in scientific management which originated in the movement concerned with work measurement, inaugurated by Frederick Taylor at the end of the first century of the first industrial revolution. Since then this movement has become the vast enterprise known as production or industrial engineering. Since then, however, has also begun the second industrial revolution based on an information rather than simply an energy technology. Unfortunately, too many of the activities of operational research and systems engineering are fashioning this second revolution (which mechanizes mental work as the first did manual work) in terms of the same value base.

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(1) Rossow, J.M. 1974. In The Worker and the Job, (ed. Rossow) The American Assembly. Prentice Hall, Englewood Cliffs, N.J.

Yet, the more complex, fast-changing, interdependent but uncertain world growing up in the wake of the second industrial revolution is rapidly rendering obsolete and maladaptive many of the values, organisational structures and work practices brought about by the first. Something like their opposite seems to be required. This is apparent in the efforts of some of the most sophisticated firms in the advanced science-based industries to de-centralize their operations, to de-bureaucratize their organisational form, and to secure the involvement and commitment of their personnel at all levels by developing some form and degree of participation in the work place.

Nevertheless, the classic efficiency cult, and the authoritarian and expert management associated with it, which Taylorism has come to symbolise, and which espouses the bureaucratic form of organisation, remains the prevailing value of contemporary industry.

What then are the characteristics of what has become the accepted and traditional philosophy of work? They may be summarized as follows: (1)

1. The single task job is the basic element into which an organisation is engineered and broken down: an analyst studies these jobs and gets them 'right' in 'the one best way' which the worker then must follow.

2. Man is simply an extension of the machine, another kind of machine part, useful only for performing those 'operations' that the machine cannot do. He is not regarded as a complementary entity with distinctive human properties of which constructive use may be made. So far as these appear they are considered a nuisance.

3. The men and their single task jobs are glued together by supervisors who supposedly absorb the uncertainties and variabilities that arise in the work situation. These supervisors need supervisors, etc., etc. until the whole enterprise is organised in a many-layered hierarchy of formal positions, governed by authoritarian and bureaucratic roles.

4. The organisation remains free to use any available (legal) social mechanisms to enforce compliance, including manipulation and coercion.

5. Job fractionation is used to reduce the costs of carrying out work by reducing the skill contribution of the individuals who perform it. The more this process can be simplified, the more can unit costs be lowerd (other costs, more indirect, persistent, and sometimes not easily measurable, are not considered).

This whole conception is often referred to as the machine theory of organisation.

In the present context there is less need to elaborate on the extent to which the concentration, atomization and control of work has been carried than to point to the nature of the penalties paid for the benefits gained. The benefits have brought more productivity at less costs in the short run. The penalties have brought more alienation in the longer run, which, spreading into the larger society has reacted back on the economic sphere. For some time this process was masked in the classic forms of industrial struggle, as organised labour sought better conditions for the mass of semi-skilled and unskilled workers - more pay, shorter hours, improved amenities. After a period of initial resistance unions began to learn how to use work-study as a bargaining method in their own interest. Nor was the question related to ownership of the means of production. Lenin admired Taylor and entertained high hopes of what scientific management might do for industry in the Soviet Union.

Industrial organisations built on these principles had their heyday in the mass production plants of the inter-war period. The developments associated with the second industrial revolution which have since taken place necessitate the search for an alternative theory, the discovery of a new paradigm.

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(1) c.f. Davis, L.E. 1971. The Coming Crisis for Production Management: Technology and Organisation. Inter. J. of Prod. Res. 9, pp. 65 - 82.

Let it also be noted in this context that the vaunted efficiency of the machine theory is not a little specious. For in calculating unit operating costs it omits the cost of the dysfunctions it creates: labour disputes, grievances, turnover, training, absenteeism, over-manning, rework, down time, demarcation expenses, unnecessary maintenance, low performance norms, etc. The level of these anomalies is not customarily thought of as a function of work organisation, but the lower levels accompanying alternative organisational forms show that they are.

The Human Relations Movement.

As the first signs of the affluent society began to appear, as the Great Depression faded into the background and as a new level of economic well-being established itself after world war II, it became evident that something of another kind was wrong, whatever the amount of take-home pay, or even security of employment. A first glimpse of what this might be had been obtained in the Hawthorne Experiments carried out by Elton Mayo's followers in Western Electric's plants in the Chicago area at the height of the scientific management wave (1). They led to the curious and belated discovery that the worker was human even in the work place and that he responded to being treated as such. This led to the rise of the human relations movement.

The direction taken by the human relations movement was one which concentrated exclusively on the enterprise as a social system. The technology was not considered. The worker was to be treated better but his job would remain the same - similarly with the supervisor, or the manager himself. The technological imperative was taken for granted. Attention was concentrated on the supposedly only variable aspect.

The need to pay attention to human relations became widely recognized when full employment conditions were established after world war II in many western countries. Older forms of coercion being unavailable, consultation became something of a norm - people had to be asked rather than told. The game of economic rewards, however, continued to be played according to the rules of wage-bargaining between management and labour where expectations of a fair deal were based on the power balance between the two parties. But wage matters apart, attempts were made to set up good relations between all groups and types of personnel in the company, especially between management and workers. So far as greater trust could be established, labour-turnover would be reduced and industrial disputes made less likely. These expectations were to some degree fulfilled.

As the management-worker interface was mediated by the foreman, a massive movement took place in supervisory training. It was soon shown, however, that it was of no avail to change the attitudes of foremen if those of management did not change as well. So began a far-reaching movement in management training, which later broadened first into management and then into organisational development.

In this process certain new beliefs about the nature of man and his basic needs and motivations in the work setting began to gain currency which were the opposite of those held in the old work ethic. Abram Maslow introduced his 'need hierarchy' which postulated that as the more primitive needs for food and security became satisfied higher needs concerned with group belongingness, self-esteem and self-fulfilment would become more salient (2). Emphasizing that this would be so even in the work place, Douglas McGregor contrasted two models of industrial man which he called Theory X and Theory Y (3). The first represented the traditional management view of the worker which had grown up with the first industrial revolution. He was "a no good" - lazy, irresponsible and selfish. He therefore required external control. The second represented an emergent view: that he was an ordinary, good human being at work as much as at home or as a citizen. He had a need for achievement, to take responsibility, and to be both creative himself and to take cognisance of others. He was

(1) Roethlisberger, F.T. and Dickson, W.J. 1939. Management and the Worker. Cambridge, Harvard University Press.

(2) Maslow, A. 1954. Motivation and Personality. New York, McGraw-Hill.

(3) McGregor, D. 1960. The Human Side of Enterprise. New York, McGraw-Hill.

therefore capable of internal control. Basically, he was self-motivating, and self-supervising.

These views, which adumbrate the new work ethic, made their impact at a time when advanced industrial societies, especially the United States, were becoming not only more affluent but were already well into the second industrial revolution with the very different tasks and roles which the newer technologies were beginning to create. These demand involvement and commitment, initiative and the good use of discretion at the bottom of the enterprise, no less than in the middle and at the top, the reason being that these new roles demand of the shop-floor work-force that its members assume direct responsibility for the immediate control of complex systems, thereby undertaking a task formerly reserved for management. This connection was not made in the human relations approach.

A view of the human side of enterprise had nevertheless come into being which was incompatible with the machine theory of organisation. This was an advance. Yet no-one attempted to alter the character of the jobs themselves which continued to be designed according to the principles of scientific management.

Forms of Industrial Democracy.

In parallel with the rise of the human relations movement a trend towards representative democracy became manifest. The aim of representative democracy is to secure a means whereby those at the lower levels of an organisation may influence policies decided at higher levels. It is to be distinguished from work-linked democracy which is concerned with the participation of those directly involved in decisions about how work shall be done at their own level.

Both these forms are further to be distinguished from collective bargaining which is concerned with wages, hours, benefits, seniority, grievances and conditions in the work environment related to safety and health. Collective bargaining may be construed as interest group democracy, the means through which organised labour gains power to take an adversary role against the interests of management. Collective bargaining becomes democratic so far as a system of formal industrial relations is established between management and labour which secures due process in conflict-resolution and leads to agreements regarded as binding by both.

Representative, work-linked and interest group democracy can exist independently or together. The first and/or the second can be used to prevent the development of the third, while the third can be used to inhibit the development of either or both of the first two. On the other hand, all three can co-exist consonantly and congruently, even though at times the emphasis and relations between them may vary.

Historically, interest group democracy appeared first, representative democracy next and work-linked democracy last. Commonly, the term industrial democracy is used to refer to any, or any combination, of the three without further specification, which causes confusion. Yet each type is a dimension of industrial democracy when this concept is referenced to the total set of phenomena associated with it. A comprehensive system of industrial democracy would require the consonant presence of all three dimensions and would be regarded as advanced so far as activities in each were well developed. This treatment permits a first measurement of the amount of industrial democracy present in an organisation in terms of scope and intensity, scaled along three dimensions, and with an additional index denoting consonnance-dissonance.

The extensive development of representative democracy which took place in parallel to the human relations movement in the '40s and '50s did not occasion any development of the work-linked form. The production committees which had consonantly related the two in several countries during world war II tended to recede to peripheral consultative roles when, under conditions of peace, interest group conflicts between management and labour reinstated themselves.

The independent developments which took place in representative democracy are to be found in the rise of co-determination in West Germany and phenomena such as the Workers Councils in Yugoslavia. These developments focussed on securing some degree of shared power on boards of management, indeed in establishing forms of worker control over the enterprise as a whole. They were either oblivious of the existence of work-linked democracy or, so far as they became aware of it, treated it with suspicion.

Moreover, these developments were not always correlated with a full development of interest group democracy as represented in the existence of strong and independent trade unions.

This relationship was examined at a conference on Workers' Participation in Management in Vienna in 1959 (1). The findings were that representative democracy was most in evidence in South East Europe where interest group democracy was least in evidence, while in North West Europe (in Scandinavia, the Netherlands and Great Britain) questions of workers' control were scarcely on the agenda of powerful and independent unions. In West Germany and in France the concerns were mixed. All this, of course, is about a state of affairs which existed 15 years ago.

Relations between representative and interest group democracy are not necessarily dissonant. They become so only under certain conditions. Under others they become consonnant.

Moreover, these relations change through time. Conditions fostering consonnance are indeed appearing in several countries in North West Europe at the present time. For example, there has been a resurgence of interest in workers' representation on Boards of Management in Norway and Sweden. Even in Britain the Labour Party has begun to favour such notions after having hitherto dismissed them. This resurgence may be associated with the increasing credence given (even in the United States) to the claimant or stake-holder theory of the enterprise. In this concept the interests of the investors are not necessarily overriding. Not only have the interests of management and labour to be considered, but those of the consumer as regard product quality and price, and of the public interest as regards environmental protection. It is suggested that all these interest groups should have Board representation so that the enterprise might become more responsibly related to society as a whole. This would not suit an era exclusively concerned with economic growth as the goal and with profit maximization as the means. But this era is passed. No longer can the economic sector be regarded as virtually independent of the social sector.

This concept, which is a function of the second industrial revolution, is broadening the meanings of interest group and representative democracy and redefining their relationship in the context of the changing environment.

It may also redefine as positive the relations of work-linked democracy to both. But when it first appeared work-linked democracy was perceived to have either no relation or a negative relation to the other two forms.

WORK-LINKED DEMOCRACY

The Contributions of Autonomous Work Groups and Job Enrichment.

The paramount task in the '50s and early '60s was to identify concretely the nature of work-linked democracy and to secure for it a separate hearing from the more familiar topics of representative democracy and trade union negotiations.

Quite early in the post world war II period the Tavistock Institute in London had undertaken an action research study at the London factories of the Glacier Metal Company (2). Concerned with group relations at all levels, this research led to the establishment of a new type of many tiered representative system. A policy-making Works Council was formed on which the constituencies of senior, middle and junior management were represented as well as the blue collar work-force through members of the shop stewards committee (whose places equalled those of the management constituencies). This body acquired considerable power vis-a-vis the Board and the independent trade union organisation. Decisions were not taken by majority vote; a unanimity rule forced conflict resolution until a genuine concensus was reached. Yet in spite of such a high degree of representative democracy the underlying alienation of the ordinary worker persisted. The 'split at the bottom of the executive chain' as it was called, remained. The only major factor which had not undergone change was the work organisation deriving from the technology. This had remained in the old modality. What would happen if this modality were changes?

An opportunity to find out arose in the then recently nationalized British coal industry where strikes, labour turnover and absenteeism were persisting unabated despite the changeover to public ownership and the introduction of many improvements in pay and working conditions. The writer with a colleague who had been a miner was able to observe at a pit in

(1) Clegg, H. 1960. Industrial Democracy. Oxford, Blackwell.
(2) Jaques, E. 1951. The Changing Culture of a Factory. London, Tavistock Publications.

the Yorkshire coalfield what happened when the method of work was changed from the traditional form of job-breakdown to one in which autonomous groups inter-changed tasks and took responsibility for the production cycle as a whole (1). The groups were formed by the men themselves. More extensive experiments using what became known as the composite method were made in East Midland Division between 1951 and 1953, initiated by W.F. Sheppard, later to become the National Coal Board's Director General for Production (2). The gains in productivity and job satisfaction were both substantial, productivity being up between 20 and 30 percent for less cost, and job satisfaction manifesting itself in decreased absenteeism, negligible labour turnover and an improved health record. During later studies in Durham Division, an opportunity arose to carry out a crucial experiment: the performance of two identical coal faces using an identical longwall technology, one organised in the conventional, the other in the composite way, were monitored over a period of two years (3). The composite face based on autonomous groups was superior in all respects. This experiment showed that the self-regulating work group is possessed of hitherto unrecognized psycho-social properties which allow unused creative potential to be realized in the work place.

Meanwhile, another Tavistock research worker, A.K. Rice, had applied composite principles in another industry in another country - the textile industry in Ahmedabad, India (4). As soon as the idea of a group of workers becoming responsible for a group of looms was mentioned in discussing the experimental reorganisation of an automatic loomshed, the workers spontaneously took up the idea, returning next day with a scheme which was accepted and immediately tried out. Early success was followed by vicissitudes due to many factors, but thereafter, a steady state of significantly improved performance was attained. Higher wages were earned and the internally led loom groups which carried out their own maintenance, offered 'careers' from less to more skilled roles, while Hindus and Moslems worked together. The system spread to ordinary looms. This experiment showed that the psycho-social properties of the self-regulating work group are not narrowly culture-bound.

Though supported by the local trade union the new work organisation came under attack from agitators brought into Ahmedabad by one of the Indian Communist parties whose unbending confrontational posture was threatened by this new form of management-worker cooperation. Members of the work teams and their families were threatened with physical violence if they continued the new system. Attempts were made to set the Hindu and Moslem workers against each other. The attack failed. The workers stuck to a system which was very largely their own creation and which enabled them to enjoy a quality of work-life, as well as a level of income, which they had not previously known. This episode shows that participation in a self-regulating work group can involve central values.

Throughout the '50s sporadic developments along the same lines were taking place in the telephone industry in Sweden, in the building industry in Holland and in appliance manufacture and chemicals in the United States. There was another way to organise productive work than the prevailing way. These was organisational choice. The new way embodied new values as well as new arrangements. It pointed towards a new work ethic and suggested that a new theory might indeed be formulated and a new paradigm discovered.

Meanwhile, in the United States recognition grew that quantified external control and job fractionation had been carried too far. Job enlargement and job rotation received extensive trials (5). A distinction was made between extrinsic job satisfaction (which included the pay packet) and intrinsic satisfaction deriving from the quality of the job itself (6). This was recognized as a factor affecting motivation. But such recognition implied altering the way jobs were designed.

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(1) Trist, E.L. & Bamforth, K.W. 1951. Some Social and Psychological Consequences of the Longwall Method of Coal-Getting. Human Relations 4, pp. 3 - 38.

(2) Sheppard, V.W. 1951. Continous Longwall Mining: Experiment at Bolsover Colliery. Colliery Guardian, 182.

(3) Trist, E.L. et al. 1963. Organisational Choice. London, Tavistock Publications.

(4) Rice, A.K. 1958. Productivity and Social Organisation: The Ahmedabad Experiment. London, Tavistock Publications(and Social Science Paperbacks, Associated Booksellers).

(5) Walker, C.R. & Guest, R.H. 1952. The man on the Assembly Line. Cambridge, Mass., Harvard University Press.

(6) Hertzberg, F. et al. 1959. The Motivation to Work. New York, Wiley.

This understanding led to the job enrichment movement which is concerned with altering the boundaries of jobs so that the tasks included make a more complete whole, giving the worker more variety, more information, more decision-making and more autonomy than he previously enjoyed. Job enrichment therefore entails considerably more than job enlargement and job rotation, though it may include them both. These activities, however, have centred on the individual rather than extending to include the group. Moreover, they have not in their orthodox form embraced participation but avoided it. The "enriching" has been devised solely by the experts.

Nevertheless, job enrichment meant changing the technological organisation, the system which the human relations school had left intact and which the scientific management school had continued to design according to the atomistic ideology that had characterized 19th century science and which representative and interest group democracy had ignored.

When job enrichment projects include participation they become congruent with autonomous work groups. Both weaken the technological imperative. Organisational choice can be exercised so that both work satisfaction and performance requirements are achieved. Indeed, prevailing performance norms are too low; traditional job design fails to utilize the capabilities of the worker.

The Pathfinding Role of the Norwegian Industrial Democracy Project.

The project which brought together in a fully participative context the various findings concerning autonomous work groups and job enrichment in order to develop a first comprehensive model of work-linked democracy has become known as the Norwegian Industrial Democracy Project. One of the objectives of this endeavour was to explore how far, and under what conditions, work-linked democracy could become the carrier of emergent social values to the new work ethic.

The project began in 1962 and is still proceeding. It grew out of a public debate about different forms of Industrial Democracy. Since 1970 many of its activities are part of the policies and practices of the Norwegian Confederation of Labour and the Norwegian Confederation of Employers. The two confederations (later joined by Government) initiated the project jointly to gain better understanding of what would ordinarily have been treated as a political problem (1). Having helped establish a group, directed by Einar Thorsrud, which had earned their trust, they requested it to undertake relevant research. The group sought the collaboration of the Tavistock's Human Resources Centre. Research plans were drawn up in conjunction with representatives of the two Confederations. Their participation in every step was crucial as the project entailed securing a very full understanding in the leadership of both sides of Norwegian industry of the findings as they became available.

The first phase of the project consisted of a field study of what actually happened in the five major concerns where workers were represented on the boards. These were either government owned or part-owned enterprises obliged by law to have workers' representatives. Though such representation was positively valued for its own sake, there was no increase in participation by the rank and file, no decrease in work alienation, no increase in productivity, as at Glacier.

These results, which were compared with experiences in other countries, were discussed in both Confederations and in the press. The widespread public discussion opened the way for second phase of the project:

> "to search for ways of securing improved conditions for personal participation in a man's immediate setting as constituting a different and perhaps more important basis for the democratization of the work place than the formal systems of representation which seemed to have reached their limit at least for the time being".

This led to the idea of field experiments in selected plants in key industries, which, if successful, could serve as demonstration models for diffusion purposes. The selections were made by the members of the two Confederations serving on the research committee in consultation with sector committees of the industries concerned. No pains were spared in developing at all levels an understanding of, and in securing an acceptance of, the experiments in the plants proposed, which had also to be seen as foreshadowing the future direction of Norwegian industrial development without being too far out.

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(1) Emery, F.E. & Thorsrud, E. (in collaboration with Trist, E.L.). 1969. The Form and Content of Industrial Democracy. London, Tavistock Publications.

The first experiment was carried out in the metalworking industry, a sector regarded as critical but requiring considerable rehabilitation. A rather dilapidated wire drawing plant in a large engineering concern was chosen on the grounds that if improvements could be brought about here they could be brought about anywhere. Productivity increased so much with the introduction of autonomous groups that the experiment was suspended. The workers concerned had begun to take home pay packets in excess of the most skilled workers in the whole plant. The experiment displayed the magnitude of the constraining force lying in wage structures and agreements negotiated according to the norms of the prevailing work culture. Interest group democracy could inhibit work-linked democracy.

The second experiment was in the pulp and paper industry, also regarded as a critical sector, but where the problem was not so much to upgrade performance with old technologies as to gain control over new. Within the Hunsfos Factories a chemical pulp plant was selected at the field site for experimentation. Here, the basic work was information handling the core task in the technologies of the second industrial revolution. The requisite skills are perceptual and conceptual; the requisite work organisation is one capable of handling the complex information flows on which controlling the process depends. To do this requires immense flexibility and capability for self-regulation. In the experimental plant a number of the key process variances were not being controlled by the social system nor had some of the important been identified. The research team had to engage those concerned in evolving a form of organisation that brought as many of them as possible under the control of the primary work groups.

The model was developed of a joint management-labour "action committee" which appointed task forces consisting of operators who actively used supervisors, specialists and managers as resources - rather than passively responding to them simply as bosses - in order to fashion an optimum work organisation for a new technology as they were learning the know-how of its operation. This demonstration of the problem solving capability of the self-regulating work group was a major advance on what had so far been shown. Important was also the fact that this company, in close collaboration with its trade union, was able to survive a serious crisis in the industry while the experiments were going on. The new work organisation was one of several innovations which saved Hunsfos from bankruptcy.

Hunsfos is located in a small community in the South of Norway in which it is the major employer. The plant seems to be well integrated in the rest of the community, both economically and culturally. It constituted an ideal place, therefore, to discover how far new values and capabilities developed in the work place may have spilled over into the family and the community. Accumulated impressionistic and annecdotal evidence suggested that they have. Systematic research begun eight years after the beginning of the project is at present attempting to identify the character and extent of whatever processes of social transfer may be at work.

The next step was taken at Norsk Hydro, the largest enterprise in Norway, which manufactures fertilizers and other chemicals where a whole plant rather than a department was taken as the system to be changed. The work practices of an old plant were refashioned and the entire organisation and operating procedures were developed for a new one. Partly autonomous shift groups were developed and took a very active part in the final phase of building the plant and in starting up the new processes. In the new plant a radically new principle of wage payment was tried out: to pay people for what they know rather than for what they do. As a man learned to perform more tasks he became more valuable, hence was worth more money. The aim was to build up an all-round capability in the work force which not only would allow its members to be flexibly deployed according to the needs of a changing technological and economic environment but would enable them to contribute through time to the continuous improvement of the operation. This project, therefore, which was successful, demonstrated what might be achieved when an industrial organisation is deliberately developed as an "adaptive learning system" (1) and when the planning process takes on a "transactive" (2) character involving all concerned.

The more recent work in the shipping industry concerned with the design and experimental trial of sophisticated bulk carriers has led to a still further innovative step being taken in the Norwegian Industrial Democracy Project. Many technological alternatives were available

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(1) For the term "adaptive planning" see Ackoff, R.L. 1974. Redesigning the Future. New York, Wiley.

(2) For the term "transactive planning" see Friedmann, T. 1973. Retracking America. New York, Doubleday Anchor.

but the chosen design was that which met most fully the needs of the small shipboard community which had to live together under isolated conditions 24 hours a day for considerable periods of time, while simultaneously undertaking all the tasks. These needs were shown by preliminary studies to be of overriding concern. This project therefore shows how the properties of the required social system may become the starting point for technical design.

These experiments were part of a national undertaking - the first of its kind - concerned as it was with work improvement in Norwegian industry as a whole. The supporting Confederations were instrumental in forming a National Participation Council and a Parliamentary Commission on Industrial Democracy. These organisations, however, have not succeeded to any great extent in diffusing the results.

This has been partly because in the large firms strong resistance was encountered in middle management, by those who perceived themselves as likely to be disbenefitted. A positive reorganisation of roles at this level had to be worked on; but supervisors and specialist staff in the numbers customary in traditional bureaucratic organisations are surplus to the requirements of innovative democratic organisations.

Another reason for the diffusion failure was that the bulk of Norwegian industry consisted of rather small firms which did not see much need to change.

The biggest effect of the Norwegian experiments has been in Sweden which has a large and advanced manufacturing sector where the need to change was felt to be critical for survival. Swedish developments which began in 1964 on Norwegian models have now surpassed them in scope and complexity of the projects undertaken.

The Socio-Technical Approach: Concepts and Methods.

Scientific management and the human relations movement had encouraged the perpetuation of a state of affairs in which the needs of technology and the needs of men, because they were presumed to be antagonistic, could be considered only separately. The emergence of work-linked democracy showed that this was not necessarily the case. If jobs were designed according to one set of principles the antagonism evinced itself; if they were designed according to an alternative set the antagonism was removed and congruence appeared.

The basic idea. A new concept was required to express the relations between men and technology which would enable them not only to be studied but improved. In the original coal-mining studies the term socio-technical system was introduced to denote the overall system of which both technologies and men are parts (1). This term has since come into general use.

The problem to be considered cannot be properly construed merely as either that of 'adjusting' people to technology or technology to people; it consists of organising the interface so that the best match can be obtained between both. Only the socio-technical whole can be effectively 'optimized'. The socio-technical whole comprises the enterprise as a whole - in relation to its environment - as well as its primary work groups and intervening sub-systems.

F.E. Emery has formulated the matching process in terms of joint optimization (2):

> "Where the achievement of an objective is dependent upon independent but correlative systems, then it is impossible to optimize for overall performance without seeking to jointly optimize these correlative systems".

Technologies behave according to the laws of physics, chemistry and engineering; men according to the laws of biology, psychology and sociology. The systems composed by the latter cannot therefore be expressed in the same terms as the systems composed by the former. When linkedas they are in work organisations their complementarity is what becomes relevant, not their pseudo-identity.

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(1) Trist, E.L. & Bamforth, K.W. 1951. op. cit.

(2) Emery, F.E. 1963. Some hypothese about the ways in which tasksmay be more effectively put together to make jobs. Tavistock Institute Doc. No. T813.

Psychological requirements. It may be shown that men have psychological requirements of their work other than those specified in a contract of employment (such as wages, hours, safety, security of tenure, etc., which are part of the old work ethic). Six such requirements may be listed that pertain to the content of a job and which must be met if the new work ethic is to develop (1):

1. The need for the job to be reasonably demanding in terms other than sheer endurance and to provide a minimum of variety (not necessarily novelty).
2. The need to be able to learn on the job and go on learning. Again, it is a question of neither too much nor too little.
3. The need for some area of decision-making that the individual can call his own.
4. The need for some degree of social support and recognition in the workplace.
5. The need to be able to relate what he does and what he produces to his social life.
6. The need to feel that the job leads to some sort of desirable future (not necessarily promotion).

These psychological requirements are not confined to any one level of employment. It is not always possible to meet them to the same extent in all work settings; nor do all kinds of people need them to the same degree - individual differences are considerable. Furthermore, these needs cannot always be judged from conscious expression such as is given in responses to attitude surveys. Where there is no expectation that any of the jobs open will offer much chance of learning, a person will soon learn to 'forget' such a requirement.

Principles of job design. To serve as principles for socio-technical rather than simply technical job design or redesign these general psychological requirements need to be linked to the objective characteristics of industrial jobs. How far do such jobs

at the level of the individual

(a) have an optimum variety of tasks,
(b) have a meaningful task pattern that gives the semblance of a single overall task,
(c) have an optimum length of work cycle,
(d) offer some scope for setting standards of quantity and quality of production and of receiving suitable feedback of knowledge of results,
(e) include some of the auxiliary and preparatory tasks,
(f) involve some degree of care, skill, knowledge or effort worthy of respect in the community,
(g) make some perceivable contribution to the utility of the product for the consumer;

at group level

(h) provide for interlocking tasks, job rotation or physical proximity where:
    (i) there is a necessary interdependence of jobs (for technical or psychological reasons),
    (ii) the individual jobs entail a relatively high degree of stress,
    (iii) the individual jobs do not make a perceivable contribution to the utility of the product,
(i) where a number of jobs are linked together by interlocking tasks, or job rotation, how far do they:
    (i) have some semblance of an overall task which contributes to the utility of the product,
    (ii) some scope for setting standards and receiving knowledge of results,
    (iii) some control over the boundary tasks;

over extended social and temporal units

(j) provide channels of communication so that requirements of the workers can be fed into the design of new jobs at an early stage,
(k) allow promotion to foreman rank through channels which are sanctioned by the workers.

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(1) Emery, F.E. 1963. op. cit.

These principles indicate that the designing and re-designing of jobs leads beyond setting the boundaries of individual jobs to the organisation or re-organisation of production groups and of related support services (such as maintenance). Sooner or later it will be found that they have even wider organisational implications involving the character of management roles and of management practice and style. In fact, they lead towards a philosophy of work which embodies the new work ethic, which must suffuse the organisation as a whole.

An analytical model. For analyzing work systems these principles may be used to develop a method of socio-technical inquiry. Though never formalized, this may be summarized in a nine-step model (1):

(1) An initial scanning is made of all the main aspects - technical and social - of the selected target system, i.e. department or plant to be studied.

(2) The unit operations are then identified, i.e. the transformations (changes of state) of the material or product which take place in the target system, whether carried out be men or machines.

(3) An attempt is then made to discover the key process variances and their inter-relations. A variance is any deviation from a standard or specification. A variance is key if it significantly affects (i) either the quantity of production or its quality, (ii) either its operating or its social costs.

(4) A table of variance control is then drawn up to ascertain how far the key variances are controlled by the social system - the workers, supervisors and managers concerned. Some of the most important variances may be imported or exported. Investigation of this is one of the most critical steps. Another is to check how far existing work roles satisfy the six basic psychological requirements. Attention is then paid to ancillary activities, spatio-temporal relationships, the flexibility of job boundaries and the payment system.

(5) A separate inquiry is made into the men's perception of their roles - and of role possibilities as well as constraining factors. Here is a mine of unsuspected knowledge as much as of unsuspected feeling.

(6) So far concern has focussed on the target system. It now changes to neighbouring systems, beginning with the support or maintenance system.

(7) And continuing with the boundary-crossing systems on the input and the output side, i.e. the supplier and user systems which comprise adjacent departments. How do the structures of these units affect the target system and in what state are relations across these inter-faces?

(8) The target system and its immediate neighbours must now be considered in the context of the general management system of the plant or enterprise, particularly as regards the effects of general policies or development plans either technical or social.

(9) Suggestions for change may arise at any point in the analysis, which proceeds by a re-cycling rather than a strictly sequential procedure, but only when all stages have been completed does it become possible to formulate re-design proposals for the target system or to take up wider implications.

This analytical model is not intended solely for the use of research workers. It is intended also for operating people in plants. It has therefore been developed as a training method.

Together with an understanding of the psychological requirements and the principles of job-design, this model has been used in a number of projects in the last three or four years in which those directly responsible have, after training, undertaken extensive programmes of work and organisational design and re-design. To enable a self-sustaining process of socio-technical change to develop in organisations of all kinds so that the new work ethic becomes fully embodied in their members is the long-range aim.

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(1) c.f. Emery, F.E. 1967. Discussion contribution to the Lincoln (England) Conference on Socio-technical Systems.

THE DIFFUSION OF SOCIO-TECHNICAL CHANGE

Now that extensive pioneer experiments have been made and a set of new concepts and methods developed, attention has been turning to the diffusion problem. How can socio-technical change not only be launched but spread and sustained especially in large organisations?

Five processes may be noted: central mandate, cumulative innovation, the innovative subsidiary, local experimentation and the professional organisation as change agent. Each has limitations. The transformation of any large organisation is likely to depend on the appropriate and timely use of more than one strategy.

The Sanction of Central Mandate.

It is sometimes maintained that approval from the top is the critical requirement for the successful carrying out of a change programme. But even when a central mandate is given, and this is usually hard to obtain, implementation does not automatically follow. The problem is then created of finding a suitable instrument to carry it out.

In Philips Electrical Industries work-restructuring experiments rapidly convinced the Main Board of the desirability of spreading socio-technical change throughout the corporation. As early as 1965 the Chairman made public his commitment to the new principles so that there should be no doubt about the sanction carried by the central mandate. The Board itself could not carry out the changes. How were they to be accomplished?

The chosen instrument was the Technical Efficiency Organisation (T.E.O.), one of the main Staff Divisions. Responsibility for appreciating the human and social aspects of work organisation was assigned to the group also responsible for the technical and efficiency aspects, causing a redefinition of mission in socio-technical terms. T.E.O. had to add psychological and social science competence to engineering and O.R. competence. The conflicts between these approaches were internal to the change-agent which had to develop in itself the integrated capability required in the plants.

Being a Staff Division, T.E.O. could not impose its policies on operational management but had to act as an internal resource, supporting and evaluating projects undertaken by plants and disseminating the findings and experience throughout the concern. A process of organisational learning of the widest kind was thus set in motion. For example, in 1968, T.E.O. issued a major report on "Work-Restructuring for Unskilled Workers" (1). This, with the sanction of the Central Mandate supporting it, had the effect of substantially increasing the number of work-restructuring projects being undertaken.

T.E.O. also undertook research studies of such projects when invited by the departments concerned. This can only take place when operating people have reached the point of wishing to increase their understanding of the complexities involved through systematic and sustained analysis. Too little of this type of evaluation is being undertaken by operating organisations. T.E.O. made available a wealth of evaluative case histories in which attention is paid to failures as well as to successes so that there has been a great deal of learning from mistakes.

More than 50 projects of various dimensions are said to be under way. But the diffusion process has been slow, depending on the creation of an internal market for the new approach, which has to be thoroughly understood and wanted by those directly concerned, or nothing much happens even when central support is given.

The Process of Cumulative Innovation.

The opposite of central mandate is the accumulation of initiatives from below until eventually a central mandate is given. Over the last seven years a process of this kind has been taking place in General Foods.

An innovative manager had designed a new plant on advanced socio-technical principles (similar to those used in Norskhydro) and brought it into successful operation with one or two key colleagues. A high level of work satisfaction was achieved together with major cost savings. This plant which was in Topeka, Kansas, received national and indeed international publicity.

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(1) A summary of the work in Philips has been published in English: Work Re-Structuring. Available through Editorial Secretary, P.P.M.R., Philips, Eindhoven.

Despite all this, attempts, which were several, to convert existing G.F. plants to more innovative forms of socio-technical organisation lagged rather badly for some years. The Topeka model was rejected. Criticisms were many; it required special conditions; it was a green field site; there was no union contract in the way; employees were specially selected; etc. Other managers did not want their plants to be compared with Topeka. There was a great deal of envy. Evidence of Topeka's operational success was disregarded. These reactions encapsulated the innovation. Similar reactions have been observed in other organisations undertaking major change programmes of this kind. High profile demonstration experiments are far from always effective as foci of diffusion in the organisation in which they have taken place. Outsiders are often more receptive.

Largely, however, through the efforts of the original innovator several small projects eventually persisted in various plants. Experience of these showed that before a change effort could make any serious headway the plant manager and his staff had to "work through" and make explicit to themselves the implicit assumptions on which traditional management and organisation are based. This rather emotional "unprogramming" ordeal had to be endured before socio-technical concepts could be learnt and the new work ethic internalized. The process had to be repeated at supervisory levels and with the union.

From these experiences emerged what has become known as the plant managers network. This is composed of several plant managers interested in carrying through local innovations who meet informally off site to compare experiences. This network has become a powerful medium for social learning.

Now, in the last year or so, a programme of considerable scope has developed in one of the largest divisions. Beginning with a small new equipment installation, it became plant-wide in the largest location and has begun to spread to others. The leading edge of the change effort has therefore become divisional.

This development has made a fresh impact on top management at the corporate level where the interest aroused earlier had not survived the antagonism to Topeka. Hard evidence was now to hand that large, and often old, unionized plants could transform themselves and begin to internalize the new work ethic and in so doing improve their operations. The Corporate Vice-President for Operations developed a document entitled "An Operations Philosophy for General Foods". This was sanctioned by the President, who had participated in the drafting, at a recent corporation-wide conference of operations management which discussed the document in detail.

The philosophy not only commits the Corporation to socio-technical work design but to principles such as maintaining labour stability. Operations managers are now testing out how far the marketing and financial sides will in practice honour this. A new dialogue has opened.

The Role of the Innovative Subsidiary.

Intermediate between central mandate and cumulative innovation is a process in which a subsidiary or division of a large corporation undertakes the role of being an experimental site. This allows the implications of socio-technical change to be experienced at all levels of management except the very top and yet to be contained in one organisational space.

A process of this kind has taken place in the refining side of Shell in the UK where five refineries have been involved. In the early '60s severe problems of over-manning were experienced together with difficult labour relations and increasing management frustration. The company decided to make an all out effort to bring about changes which would make possible a higher level of motivation and commitment to company objectives on the part of all employees, leading to an enhanced level of performance. The results have been publicly reported for the years 1965-70 (1).

A small team was set up to study the company's longstanding motivation problem on a full-time basis and to propose long-term plans for solving it. A collaborative relationship was established between outside social science resource people from the Tavistock Institute and internal resource people from the compnay. One result was a considerable transfer of knowledge and skills into the organisation.

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(1) Hill, C.P. 1971. Towards a New Philosophy of Management. London. The Gower Press.

A document was produced that stated explicitly the objectives the company would work toward and the management philosophy, or values, which would be used to guide decision making in pursuing them. Key features of the document were a reconciliation of the company's economic and social objectives and the adoption of the principle of joint optimization of the social and technical systems.

At a residential off-site conference, the top management team of the company, led by the managing director, committed itself to the objectives and philosophy and to seeking commitment to them throughout the organisation. The top management team met under similar circumstances at critical decision points in the programme to decide and guide the general course it should take. In order to secure this wider commitment a complete dissemination program was developed. Through numerous conferences at each location, large numbers of employees at all levels were able to test the objectives and philosophy for themselves. The remaining employees had an opportunity to do this at departmental meetings, eventually all the employees in the company were included. The dissemination process was dynamic, not stereotyped. Different methods were tried out, and each location developed programmes that were best suited to its own refinery situation. The dissemination process achieved considerable success in securing a widespread understanding of and commitment to, the company's objectives and philosophy. It also produced quite a number of highly enthusiastic employees. They represented the critical mass who led the process of implementation.

With few exceptions, trade union representatives, both outside officials and internal shop stewards, reacted very favourably to the company's intentions and offered their support. The dissemination programme developed new skills in many people and created a climate in the company that permitted and encouraged trying out new ideas. Although not all the experiments fully achieved their purpose, they contributed to the overall learning and development and provided a stepping-stone to the next move forward. An important example of this type of innovation was the setting up of joint management-union working parties, whose new role and new frame of reference were accepted by the majority of the shop stewards and by all of the trade union officials. Although they did not fully complete their tasks, the work they did made a valuable contribution to the productivity bargains that followed.

The outcome of the productivity bargaining, after the expenditure of much time and effort, was also very successful. More important than the content of the bargains - significant as that was - was the manner in which they were decided. Both management and union representatives were dedicated to the bargaining's success and shared to a greater extent than ever before the same frame of reference. The level of participation on the part of shop stewards in the formulation of the bargains and the level of effective communication with the shop-floor employees was exceptionally high. The result was commitment to the content and the spirit of the deals, not merely a collection of unenforceable agreements. A more general result of the new climate and the new collaborative working relationships between shop stewards and management was a vast improvement in the industrial relations situation at Shell Haven, where they had been exceedingly bad. General morale improved accordingly.

The other major field where innovation took place was in the design of jobs. Here again, partial success in one venture did not stop progress, but led to the start of another. The process was again dynamic. The pilot projects at Stanlow Refinery created great opportunities for learning and indicated good possibilities for improvement in performance levels. The introduction of two simplified methods of analyzing existing systems provided another great learning experience, in which many people in the company were involved. The application of the methods at Stanlow showed good and promising results. As with the earlier pilot projects, they demonstrated how shop-floor employees could contribute significantly to these results. The nine-step method of socio-technical analysis was also found valuable, both as a training tool and in its practical application in places outside the company.

The largest-scale application of the philosophy was in the design of the social system at Teesport, the new highly automated refinery. The principle of joint optimization of social and technical systems was consciously and carefully applied, with highly successful results. A wide variety of other implementation measures were all undertaken within the framework of the philosophy. They included changes in the staff appraisal system and in manpower planning, job enrichment, and so on.

The development programme was subjected to many countervailing pressures, some internal (such as the retirement or transfer of key people, both in management and among the resource people), and others external (such as the disruption of crude supplies by war and the pressures felt at the Teesport refinery to regress to old norms).

The countervailing forces mentioned above have arrested the progress of the programme in Shell (U.K.). Indeed, a regression is apparent if the early '70s are compared with the late '60s, despite the enormous effort made initially. The sustaining of innovation over long time periods is a problem requiring further study.

The U.K. initiative has been taken up and developed further in Australia by one of the British refinery managers who went out there. Recently a major programme has been put under way in Holland outside the refining field. Members of the Group Board have been kept informed of what has been transpiring from the beginning of the British project. They have never interfered but have not felt that the process has reached a point where active Group policies were indicated.

The Function of Local Experimentation.

The difficulty of effectively obtaining top management commitment in very large organisations will have been demonstrated in the accounts which have been presented. Fortunately, a number of cases demonstrate that significant changes can take place on a small scale here and there at the departmental level. They are often spontaneous and unofficial. They do not attract undue attention, which is their protection.

A remarkable case of this kind has been reported from Corning Glass (1). One or two innovators in the R & D department of one plant began to introduce experimental socio-technical change with the assistance of behavioural scientists. Other departments tried out changes for themselves. There was no pressure.

There is some reason to expect that local experimentation will become more common. The search for a new work ethic and for organisational values and forms that will embody it is in the last analysis a response in the wider society to profound changes taking place within itself. Many more people are likely during the mid and late '70s to pick up the relevant signals from the environment than during the late '60s and early '70s and to act on them. The pioneer projects have shown the way and some of the larger socio-technical change efforts have received a great deal of publicity, as has the alienation phenomenon. What appears to be happening in a number of organisations is the appearance, simultaneously or in close succession, of multiple small change efforts in several different places. The burdensome processes of securing sanction from the top are not undertaken. The managers concerned simply become pro-active, assuming that to make the required changes is within their discretion - and union locals don't always inform their higher echelons. This way of proceeding is becoming more possible as the new work ethic becomes more familiar. The number of these small endeavours is not only increasing but networks are beginning to form which connect them between as well as within firms.

The Professional Organisation as Change Agent.

In Japanese industry in the last ten years a grass roots movement has arisen involving a new philosophy of work with special reference to improving product quality by increasing worker involvement, participation in decision-making at the shop floor level, and encouraging personal development (2). It represents a dramatic break with the traditional paternalistic culture of the Japanese factory and the Taylorism which the society had imported into this.

Sony has been a leading exponent of the new philosophy and attributes a significant role to it in the firm's remarkable growth, particularly with reference to the ability of their work force to cope with the rapid technological change in their products.

A societal change which may be linked to the movement is that status in terms of age, so fundamental in Japan, is being diminished, though the process is no more than in its first very early phase. The older and the younger generations are nevertheless beginning to merge at least in the work place into a kind of senior-junior, teacher-pupil relationship performing closely associated jobs in which they assume joint responsibility.

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(1) Beer, M. & Huse, E. 1972. Improving Organisational Effectiveness Through Planned Change and Development. Journal of Applied Behavioral Science.

(2) The best short account in English of the developments in Japan is by John Hird in Professional Engineer, 1971.

This relationship also extends to the scientist-technician and to people with differing backgrounds and academic disciplines who are brought together to solve problems across technical, business, financial and political boundaries. In these respects Japanese social structure in the work setting is beginning to develop into a series of collective partnerships, involving deep relationships and effective teamwork, supported by free-flowing information, responsible judgement and a good deal of youthful zeal. Where will this lead the society as a whole with its complex and long-evolved culture?

Of special interest is the mechanism of the teamwork, which is carried out through what the Japanese call Quality Control Circles. These circles can best be described as groups of workers and foremen who voluntarily meet together to solve shop-oriented production-quality problems. They aim at improving daily work and human relations through the "mutual development of the participants". The foreman is usually but not always the leader.

The first Circles were entirely spontaneous. Their importance, however, was recognized by a critically relevant national professional association - the Japanese Union of Scientists and Engineers (JUSE). Members of this organisation began to nourish the circles in various work places. It soon became JUSE's official policy to give them technical assistance and as more circles began to form they were registered with it. In this way a national network was built up which was independent of any particular firm, yet which had great power of organisational entry.

Since June 1962, when the first three circles were officially registered with the JUSE, the Q.C. Circle movement has had a fantastic rate of growth. The members of the Fourth Q.C. Team who toured the United States in September 1970 reported that there were over 400,000 Circles, with over 4,000,000 workers. Since then the numbers have grown to more than 500,000 and 5,000,000 respectively. A Circle may have as few as three or as many as 20 members but generally between 5 and 10. Once a Circle is registered with JUSE it becomes part of the national organisation.

Cost savings range from as little as $250 to a high of $500,000 per case per year; savings of $100,000 are frequent, and the average runs about $56,000. While 32% of the Q.C. meetings take place in working hours and 44% outside, 24% meet under both conditions. When meetings take place outside working hours, compensation is offered in 71% of cases. While 35% of Circles meet once a month, 65% meet more often; 80% of the meetings are for an hour or more (35% for two hours or more).

Of 1,566 companies surveyed by JUSE 1,424 (91%) were using Q.C. Circles. The industries covered included chemicals, electrical, textile, general machinery, wood products and consumer products. Japanese writings on the subject lay stress on a philosophy of happiness and creativeness in work. In fact, features of what we have called the new work ethic are emerging against a very different cultural background.

A prominent feature of Circle activities is the extent to which they are concerned with teaching workers the technical skills of industrial engineering, quality control, etc. That is to say, the professionals have ceased to hoard the knowledge which is their power. They are sharing it. This is a process of work-linked democracy which has no parallel in the West.

CONCLUDING OBSERVATIONS ON THE SELF-REGULATION OF WORK

Automony, Personal Growth, and Participation.

The projects reviewed indicate that types of organisation structure, management methods, and job content can be developed that lead to cooperation, commitment, learning and growth, ability to change, high work satisfaction, and improved performance. When responsible autonomy adaptability, variety, and participation are present, they lead to learning and behaviour that improve the organisation and enhance the quality of working life for the individual.

Autonomy means that the content, structure, and organisation of jobs is such that individuals or groups performing those jobs can plan, regulate, and control their own work worlds. Autonomy implies a number of things, among which are the need for multiple skills within the individual or within a group organised so it can share an array of tasks; and self-regulation and self-organisation, which are radical notions in conventional industrial organisations. Under the principle of self-regulation, only the critical interventions, desired outcomes,

and organisational maintenance requirements need to be specified by those managing, leaving the remainder to those doing. Specifically, situations are provided in which individuals or groups accept responsibility for the cycle of activities required to complete the product or service. They establish the rate, quantity, and quality of output. They organise the content and structure of their jobs, evaluate their own performance, participate in setting goals, and adjust conditions in response to work-system variability.

Research indicates that when the attributes and characteristics of jobs are such that the individual or group becomes largely autonomous in the working situation, then meaningfulness, satisfaction, and learning increase significantly, as do wide knowledge of processes, identification with the product, commitment to desired action, and responsibility for outcomes. These findings support the development of a job structure that permits social interaction among jobholders and communication with peers and supervisors, particularly when continuity of operation is required. Simultaneously, high performance in quantity and quality of product or service outcomes is achieved. This has been demonstrated in widely different settings.

The content of jobs has to be such that individuals can learn from what is going on around them and can grow, develop, and adjust. Relevant here is the psychological concept of self-actualization or personal growth, which appears to be central to the development of motivation and commitment through satisfaction of the higher-order intrinsic needs of individuals. The most potent way of satisfying intrinsic needs may well be through job design. Too often jobs in conventional industrial organisations have simply required people to adapt to restricted, fractionated activities, overlooking their enormous capacity to learn and adapt to complexity. (Such jobs also tend to ignore the organisation's need for its workers to adapt). In sophisticated technological settings, the very role of the individual is dependent on his adaptability and commitment. With nobody around at a specific instant to tell him what to do, he must respond to the situation and act as needed. The job is also a setting in which psychic and social growth of the individual should take place. Blocked growth leads to distortions that cost the individual, the organisation, and the society. Where the socio-technical system is designed to that the necessary adaptive behaviour is facilitated, positive results in economic performance and personal satisfaction have occurred at all levels in the organisation.

Man surely has always known, but only lately has it been demonstrated, that part of what a living organism requires to function effectively is a variety of experiences. If people are to be alert and responsive to their working environments, they need variety in the work situation. Routine and repetitious tasks tend to dissipate the individual. He is there physically, but not in any other way.

Another aspect of the need for variety is less well recognized in the industrial setting today, but will become increasingly important in the emergent sophisticated technological environment. Cyberneticist W.R. Ashby has described this aspect of variety as a general criterion for intelligent behaviour of any kind (1). To Ashby, adequate adaptation is only possible if an organism already has a stored set of responses of the requisite variety. This implies that in the work situation, where unexpected things can happen, the task content of a job and the training for that job should match this potential variability.

Participation of the individual in the decisions affecting his work, in development of job content and organisational relations, and in planning of changes, is fundamental. Participation plays a role in learning and growth and permits those affected by changes in their roles and environments to develop assessments of the effects.

Implications.

The new work ethic has implications for leaders of business and industry, unions, and government, some of which will not be easily accommodated, for they require fundamental rethinking of the roles of people in organisations and concomitant modification in organisational form, management, labour contracts, and government regulations.

Some of the conclusions are directly contrary to cherished beliefs held at all levels of our society. Widely held beliefs cannot be undermined rapidly - a reason for the slow progress to date. The most significant conclusions and implications can be stated as follows:

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(1) Ashby, W.R. 1960. Design for a Brain. New York, Wiley.

- Productivity or efficiency versus the quality of working life is in itself an inappropriate concept. Productivity and quality are not opposite ends of a continuum, but are on two different scales. Enhancing one does not necessarily diminish the other. Under appropriate organisational structure and job design, experience shows that the two are directly related, i.e. both increase together.

- Coercive regulation and control by management begets more coercion. Planning and measuring to achieve and maintain coercive or repressive regulation and control of an organisation's members trap both management and unions. They are forced into dead-end situations, with no options for developing suitable social or technical organisations. Urgently required are new ways of measuring outcomes where the social system and its members are considered as resources as much as the technical system and its parts are now. At national as well as company level, the incompleteness of economic theory and supportive accounting systems relegates these concerns to externalities, removing them from organisation design and the management decision process. The effect has inhibited considerations of the quality of working life.

- Regarding flexibility of technology, the indications are that the opposite of technological determinism is the reality. Results of socio-technical design of factories with sophisticated technology indicate that there is more than enough flexibility on the technological side to suit social system requirements for a high quality of working life. Of course, there are limitations, but the full constraints are not known because almost everywhere engineers are asked to look at and design the technical system independently of any other considerations.

- Self-regulation and control at the workplace through autonomous or semi-autonomous jobs and groups, yield high levels of satisfaction, self-development, and learning and high performance in output and quality. They form the basis for further organisational design to reduce the repressive and coercive character of organisations and resulting worker alienation.

- In all instances where substantial enhancement of the quality of work life has taken place, it was preceded by a rethinking of management ideology about how organisations and individuals work. The ideology of the first industrial revolution regarded man as unreliable, unmotivated, and responding only to economic inducements. Men were spare parts in organisations and society. This ideology has had to be reassessed and changed. Though spurred on by the requirements of the second industrial revolution, this reassessment is a slow process and a large undertaking.

Appendix

STRATEGIES FOR WORK IMPROVEMENT PROJECTS *

Primary Work Group Re-organisation.

Assembly-Line Modification.

The Sheltered Experiment.

New Technology as an Impetus to New Organisation.

The Plant as an Evolving Learning System.

The Redesign of Maintenance Roles.

The Upgrading of Supervisory Roles.

Complexity and Interface Negotiation.

Professional Career Development.

* The examples given are taken from Davis, L.E. & Trist, E.L. Improving the Quality of Work Life: Socio-technical Case Studies. In Work and the Quality of Life ed. James O'Toole. 1974. M.I.T. Press, Cambridge, Mass. and London, England.

Primary Work Group Re-Organisation.

The importance of re-unifying the primary group when this has been broken up by technology was shown in the original studies in underground coal mining in Britain. This experience is at the present time being used in the American coal industry. In one mine an autonomous section has been operating experimentally for nine months. The management has given up the right to direct the work face so that the men have become responsible for production, while the foreman has become responsible for safety, on the job training and forward planning.

One of the main objectives of the experiment is to raise the safety level by removing the contradiction present in the foreman's role when he was responsible for production as well as safety. Throughout the nine months the section has had only one last-time accident, a record for the mine. Absenteeism is down to 2%, industry average is 15%. With the training that had to take place as men learned to interchange roles and manage their work distribution a temporary shortfall in production was expected but this has not happened. Work delays are being reduced and new ways of operating are being explored. Detailed information on performance is fed back to the men. An increase in productivity is now expected, though it has not yet been regularly established.

This project is under the supervision of a labour-management committee which has set the ground rules. These have included paying the top rate for all members of the section who share equally in the overall responsibility for results while interchanging jobs. They will share also in any productivity gains eventually proven in ways yet to be decided.

Periodic day conferences are held attended by the 27 members of the section, the foremen, the key members of mine management and the trade union officers. Smaller meetings are also held. A process of organisational learning has been set in motion which has already led to further developments. For example, the mine is about to open a new section and, as the result of decisively favourable union vote, this will be operated with autonomous work groups. Preparations are being made to convert the whole mine in accordance with these principles.

The men told District and International Union Officers at a recent meeting that they are under less stress, are less tired when they go home, are helping each other, find that management is treating them with new respect and feel that they now have a piece of the action. The project is being evaluated by a research team which is independent of those concerned with the action research side.

Assembly-Line Modification.

A manufacturing department producing a line of small plastic medical appliances in a unionized West Coast firm in the U.S. was the setting of the first controlled experiment on the shop floor to manipulate the configuration of technology (as interpreted in task design and assignment) as jobs. The specific purpose of the experiment was to explore the conditions under which improvement in productivity could be expected from changes in job content. The major criteria used to evaluate the effectiveness of the modifications were quantity and quality of output; worker attitudes and satisfaction were also measured. Modifications were introduced through the department manager. Two experimental job designs were compared with the existing assembly-line job design: (1) Group job design. The conveyor and pacing were eliminated and workers rotated among nine individual stations using a batch method of assembly. Other conditions were the same as for the existing design. (2) individual job design. All nine operations, final inspection, and securing of materials were combined into one job and performed by workers at individual work stations.

The experiment showed that greater variety of tasks and responsibility for methods, quality, pacing, and product completion led to higher productivity, quality and satisfaction. Under the group job design (no pacing by conveyor), the productivity index fell to an average of 89, compared to the assembly-line average of 100, while quality improved. Defects fell from an average of 0.72% to 0.49% per lot. Under the individual job design, after only six days the average productivity index rose slightly above the original line average. Quality improved fourfold, with defects per lot falling to 0.18%.

Interviews with assembly-line workers and a survey of their attitudes and expectations before any changes were introduced indicated that they were satisfied with their jobs, management, and the company and considered the lack of responsibility a positive feature. They were dissatisfied with pacing, the repetitiveness of the work, and the lack of opportunity to do

higher-quality work. The identical interviews and survey after individual job design was operating indicated that the same workers were satisfied with their composite jobs and were eager for more responsibility and the opportunity for self-regulation. When asked to compare the composite with the previous assembly-line jobs, they indicated that they would leave the company before going back to the old methods.

This experiment was carried out 15 years before the major transformations of the auto-assembly line at Saab-Scania and Volvo. As everyone acquainted with these developments knows, they were undertaken because labour turnover, absenteeism, rejects and problems with foreign workers had reached a level where an alternative had to be found. What they have added, however, is not so much further knowledge about group working as a demonstration that in order to attain its benefits management has been prepared to alter the technology. The inflexible mechanical conveyor has been replaced by the flexible car carrier. Layouts have been changed so that material can be transported to and from the work bays without disrupting the groups.

The Sheltered Experiment.

As a novel and valuable strategy for making changes in existing organisations, the sheltered experiment was developed in the Canadian aluminium industry. The experiment lasted twelve months and was sheltered by agreement from management rules and union contracts so that both parties could see concrete results. A growing number of industrial studies reflect the impact of sophisticated automated technology on organisational structure. The semiprocess technology normally used in continuous aluminium casting generated randomly spaced responses by workers. The sheltered experiment called for the introduction of semiautonomous work crews. Within each crew there was interchangeability of tasks, so that roles became larger than jobs. The crews also assumed responsibility for deciding who would perform a certain task and when it would be performed.

The results were (1) high satisfaction of workers with new roles and the new skills learned; (2) demonstration of a new organisational form (the self-regulated work team); and (3) increased ability of the work crew to meet emergencies. Production of the casting unit increased 12% and productivity attributable to the experiment showed a net gain of 7%. The cost per ton of production was reduced by $2.35 compared to the previous period.

New Technology as an Impetus to New Organisation.

In addition to the sheltered experiment, another project was carried out in the same Canadian aluminium firm which resulted in the formation of a large number of autonomous work groups to look after some 3000 smelting furnaces (or pots). The project shows what adaptive social change can accomplish when a new technology essential for cost-effective operation in an intensely competitive worldwide industry renders obsolete the traditional forms of work organisation.

The new technology involved the substitution of solid-state in place of mercury arc rectifiers, increasing the amperage in the pots and leading to higher productivity. The higher amperage required a different level of continuous quality control, made possible by the introduction of on-line computers. The greater heat and frequency of certain operations made it necessary to mechanize a large number of tasks of the pot line operation. Control of the traditional French Canadian work force, whose older members were poorly educated and rural in outlook, had been achieved through close external supervision and a rigid hierarchy of narrow one-man jobs. This form of organisation could not handle the new technology.

The divisional management was trained in socio-technical concepts and analysis. This management, in consultation with supervisors and key workers (after agreement with the union), whom they in turn trained, worked out a new form of organisation in which primary, internally led groups of six workers were responsible for a line. In addition, there were extensive changes in the service and maintenance departments. Because the new work organisation required considerably fewer men and supervisors, acceptance of the plan was not immediate. Alternative employment had to be found for some, early retirement was given to others. Great care had to be exercised since unemployment in the region was high.

A recent communication from the personnel manager states that the new groups have done well

improving during their two years of existence. Quantitative records of the results are still awaited. This and related experiments have led to similar work arrangements in two new fabrication plants and have attracted wide attention in Canada because of the firm's standing as a leading Canadian enterprise.

The Plant as an Evolving Learning System.

Continuous development of all workers in a department can be achieved by moving men and groups to a semi-autonomous condition as part of a company-wide programme, as was demonstrated at an oil refinery in England. The variety of changes introduced included widespread participation in decision-making and the development of new competencies through on and off the job training over a three year period.

Each machine operator was given a complete sub-process unit to control, including an instrument panel in the main control room. Jobs in the shift teams were flexible and operators learned each other's units and assisted each other in times of upset. Time clocks were removed, and flexibility of arrival, departure, and time away from work was allowed. (Men were able to make arrangements with the senior operator for competent replacements). Training was provided in the plant and at a local technical college. Operators covered for each other to take time off for training. Senior operators were given authority to alter plant conditions in order to meet a weekly plan and became able to run the plant safely and efficiently without management intervention.

Everyone participated in planning changes, including redesign of the routing of pipelines. This redesign removed considerable operating problems for the men, and the costs saved paid for the modifications in less than a month. The men were given complete responsibility for test runs and routine testing. As a result, the life of equipment was extended significantly - before repair shutdown and off-plant testing was reduced by 75%. Supervisors and foremen had complete discretion about expenditures within the department budget.

The results indicate increased job satisfaction and more effective operations. The sickness-absence rate fell from 5.4% to 2.8%, and the promotion of senior operators to foremen doubled over the three-year period of the experiment compared to the previous year. Output in the first unit increased by 35% and in the finishing unit by 40% because of technical improvements suggested within the department. The second and third units, whose outputs limit total plant output, increased by 100% because of improvements in manual operations. The entire process plant department achieved a steady operation requiring little management intervention. The men became more satisfied both with their jobs and with management.

The Redesign of Maintenance Roles.

Modification of job content and of the organisation units of general maintenance craftsmen was undertaken by a U.S. West Coast branch of a national industrial chemical manufacturing company. Local management was seeking to improve productivity, to eliminate jurisdictional disagreements among various crafts, and to respond to worker demands for more creative activities and opportunities for closer identification with the job. Crucial to the entire undertaking were the presence of a strong industrial union and a long history of mutual trust and respect in union-management relations.

Maintenance crews consisting of broad-spectrum repairmen for general maintenance were assigned to each operating department. Centralized shops, having conventional single-craft jobs, supported the departmental crews by doing work requiring heavy or costly machinery. The jobs of the newly designated maintenance repairmen were enlarged to include general welding, layout and fabrication, pipe fitting, boilermaking, equipment installation, and dynamic machine repair. The additional skills were acquired by means of a formal on and off the job training programme. Jobs were then reclassified and wages increased accordingly. To support the crews, two specialist classifications were introduced. Workers in these classifications performed certain special types of welding and machine repair.

The changes in organisation and enlargement of jobs produced positive results in a number of criteria of operational effectiveness: quantity and quality of output, lowered costs, and personal relationships and reactions. Before the changes were initiated, the company's total maintenance labour costs had moved upward, paralleling the national index. After

reorganisation and job enlargement, the labour costs index fell from 130 to 110 in two years (the index was 100 in 1954), while the national index continued to rise, from 110 to 120. The labour costs of the enlarged group of maintenance repairmen, considered separately, fell from an index of 90 to 65 over the same period. When the index of performance (output divided by direct labour costs) was examined, the production departments showed no change over the period, while the maintenance repairmen showed an increase from 150 to 230. Total employment in the firm was reduced from an index of 100 to 95. The ratio of complaints about product quality and packaging to orders shipped, an indirect measure of quality, fell from an index of 100 to 55 over the same period.

In interview, workers with enlarged high-skill maintenance jobs were concerned with the importance of their jobs, control over content and work methods, variety of assignments, special training, responsibility for quality, and performance of preparatory activities. The responses indicate that they were concerned with matters to which management attaches great importance, possibly foreshadowing the development of identity in objectives between management and workers holding enlarged jobs. Workers indicated that they wished to make contributions to improvements in operations. They related company success to their own and their own advancement to better skills and performance. They identified learning of new skills as a positive value of the job and indicated readiness to accept additional duties to help improve their own and group performance.

The Upgrading of Supervisory Roles.

It is difficult to design supervisory roles because there are few good models to follow. These jobs are often complicated by the supervisor's conflicting objectives vis-a-vis workers and management and by conflict between the supervisor's management objectives and his superior's. In addition, supervisors are often uncertain about the behaviour required for effective leadership, the implied threat to their status and effectiveness inherent in the authoritarian-participation conflict, and the ambiguity that exists over the discharge of their responsibilities. For purposes of designing supervisory jobs, there is a paucity of information and data apart from generalities concerning leadership behaviour.

Two modifications in supervisors' jobs were introduced separately into a number of experimental aircraft instrument shops in the U.S. (Control shops were selected that paralleled these in terms of type of work, style of supervision, worker skills, and past performance). The changes were undertaken in the industrial facility of a West Coast military aircraft overhaul, repair, and test station. Except for senior executives, all 5900 employees were civilians. The modifications were as follows: (1) Product responsibility. The redesigned supervisor's role involved responsibility for all functions required to complete the products processes in the shop. This changed two experimental shops from functional to product organisations, requiring the acquisition of additional knowledge and skills by supervisors and workers. (2) Quality responsibility. Inspection was added to the supervisor's functions, including authority for final quality (authority to accept or reject a product). (Some time after the quality control inspectors were withdrawn the supervisors transferred the authority to key workers).

The objective performance of the supervisors improved. Supervisor behaviour became more autonomous and more oriented to the technical problems of producing the product and to worker training. The modifications shortened the quality and process of information feedback loops to workers and concentrated dispersed functional authority. As supervisors moved towards technological aspects of management, giving more time to planning, inspection, control etc., they had less time to manage the men, who to a much greater extent managed themselves. This change in management style was acceptable to the workers, as judged by their positive attitudes. The attitudes of supervisors were also enhanced in the experimental shops, indicating that the changes satisfied personal needs and helped to develop individuals who were contributing to the organisation's viability or health.

Complexity and Interface Negotiation.

Several of the leading U.S. aero-space firms have made use of behavioural science concepts and methods to improve interpersonal relations, but few have gone on to employ them to change work organisation. A recent report, however, describes an action research project in

one of the most sophisticated of these firms which took such a step to improve its project and matrix organisation.

The "workers" were engineering analysts (with M.A.s) and computer programmers (with B.A.s) producing software. The interaction between these two groups was too complex to be managed from outside. Status differences and mutual distrust had to be overcome before it could be managed from inside. Moreover, this could not be fully accomplished until new relations had been worked out with the technical supervisors and heads of the functional departments and with the project manager. This set of relations comprised the "nuclear system".

The high degree of uncertainty characterising the work and the many un-anticipated problems encountered led to crisis management that was prodigal in the expenditure of resources without containing cost overruns.

Key groups were often shut up together for several weeks, working overtime, in a place known as the "bat cave" from which they would emerge only when a critical problem had been solved. Correspondingly, project managers could hire any talent they wanted from other departments or from outside on short notice to catch up on delays. They could then dismiss these men as soon as they were no longer needed. This practice was called the "job shop".

The research showed that these customs could be replaced by regular and open dialogue among all concerned. Group meetings were organised that helped develop a shared "cognitive map" of everything that had to be done, and flexible monitoring was initiated which permitted continuous adaptive planning. In fact, a new type of control system was evolved that increased learning and personal satisfaction, while improving results.

Professional Career Development.

A leading U.S. aero-space firm was suffering from large cost overruns and time delays in meeting contract requirements for the design and testing of aero-space devices. The nature of the devices (and the contract) called for state-of-the-art design, i.e. invention of new designs along with the use of existing parts or subunits. The firm's management felt the designers were recalcitrant, at worst (or unrealistic perfectionists, at best), spending too much time and money in doing their work.

Analysis determined that these highly skilled and privileged aero-space engineers were rejecting existing designs and proceeding to design de novo. In the aero-space industry could they be expected to behave otherwise? Those working in the industry have learned to relate more to the industry as a whole than to the individual firm. As contracts changed, engineers and scientists would move to new contracts, usually in other firms. The crucial aspect in this interfirm movement is the state-of-the-art capability of the scientists and engineers. This is what the firms are looking for and what makes for the difference in value (and income) of the engineers. It is the touchstone of continued employment.

When management understood the basis of the behaviour, a solution that embodied both jobs and career needs was developed. Management began to consider how immediate contract needs could be met for the organisation while the individual maintained his state of the art. This was accomplished when immediate work was viewed as an intersection in time between two tracks. The first track consisted of a series of tasks or jobs required by the organisation; the second track consisted of experiences that advanced or supported an individual's capabilities. This is the same concept as professional career development, and is, of course, essential to the concept of human resource management.

The career needs of the individual and production needs of the organisation were considered jointly. This required that management guarantee, through planning, that an individual has career-advancing assignments soon and frequently, although at any one time he may be engaged in more routine assignments. This programme provided a new basis for the organisation and its members to satisfy their different but related needs.

WORKING PAPER FOR GROUP I

"THE WORKING LIFE IN EUROPEAN SOCIETY"

PRESENTED BY MR. F. LAGRANGE,

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While work has been a permanent feature of the history of humanity, "the nexus between man and nature", as Marx has it, the question of working conditions has come to the forefront only since the industrial revolution. That event marked the beginnings of the collective organization of work on a scale affecting the whole of society. From being the autonomous activity of the individual, human work was then incorporated into large units of production: the actual work performed, the conditions of work and pay have been subject to a power outside the worker himself. This fact would appear to be at the source of the protest movement over working conditions which has continued unremittingly for about a hundred and fifty years. This protest which has appeared in widely varying forms and degrees of intensity from one period and one country to another, has been aimed against both the material conditions of work and against the power relationships which they represent. Since the early beginnings of the industrial era, then, right up to the present time, the problem of work has been of concern to the whole of the social policy and therefore society itself, and not merely at the actual level of its performance, within one firm or another. Over the last century and a half, working conditions have of course undergone far-reaching change. Working hours, wages, health and safety, relations between management and labour - on all these fronts there is nothing in common between the descriptions of the English or French factories of the 19th century and the conditions for industrial and office workers of 1974. The cumulative effects of strong growth combined with the existence of active trade unions and the establishment of staff bodies within undertakings have led and are still leading to a genuine and continuous improvement in working conditions.

However great these changes, the working world is today going through a form of crisis in the advanced industrial societies and protest, far from diminishing, seems to be gathering new vigour, whose explosive potentialities are becoming more and more apparent: longer and more frequent strikes, factory sit-ins becoming more common, embitterment of social relations, a turning-away from industrial work, employment of increasing numbers of immigrant workers, absenteeism, refusal to support the collective aim of a company together with demands for more participation and control within the firm, and so on.

What are the causes of this renewed attack on the working conditions - which is the more paradoxical since economic growth has transformed the life of the workers ? What paths should be followed in the future ?

I. The attack on working conditions in modern industrial societies

Until recently, the accepted view has been that, thanks to growth, working conditions have been and can still be constantly improved. The plain and unarguable proof of this thesis seems to lie in the obvious contrast between the situation of workers today and the conditions suffered by the first generations of the industrial society. Social progress since the second world war offers almost spectacular confirmation of this view for the more recent period.

However, although this is a powerful argument, a number of facts today lead to the question whether these new forms of debate on working conditions may to a large extent spring from the dynamic of growth itself. Three features have characterized the growth-model of the industrial nations:

1. The effort to achieve maximum productivity by the scientific organization of work-organization and method;

2. The effort to achieve maximum profits, investment and comsumption;

3. The efforts to bring about the concentration of economic activity, which lies at the root of the major complexes both of production and of urban growth.

Unless we object to growth itself, there is no point denying the extraordinary impulsion imparted by these three principles; that it would appear now that the present protest about working conditions is the end-result of application to excess.

A. "Organization and method" no longer accepted

Even though the principles of organization and method as set out by Taylor as early as 1911 in his work "Scientific Management" are well known, it is worth describing them briefly to show that in the long run they could hardly avoid generating a reaction (1).

a) The determination of methods of work is too complicated to be carried out by the workers. In factories, specialized planning units should be responsible for this operation by analyzing machines making time and motion studies. If the workers are allowed any latitude, there is a risk of hazards which are incompatible with efficient organization and adequately reliable projections.

b) The simpler and shorter the tasks to be performed, the more likely are they to be executed correctly, and the shorter will be the time required to train workers.

These principles lead to two consequences in the approach to jobs and the distribution of work:

(i) maximum specialization

(ii) repetition.

In the course of time this original theory has been made somewhat more flexible, and has been applied more or less stringently depending on the sector or the firm. The fact remains, however, that this view of organization and method has had a profound effect on the entire planning of industrial work and has even gained considerable headway in the tertiary sector. This has led to the large-scale development of what Georges Friedmann later (1956) called "travail en miettes" or fragmented work based on extremely limited and repetitive tasks, of which assembly-line work is the extreme example: the worker has a fixed work-point and his rate of work is imposed on him. The task is reduced to a few movements, the time allowed for which is sometimes measured in seconds.

Criticism of this system - which was making itself heard even before the second world war (Les Temps modernes, by Simone Weil and others - was countered by two fundamental arguments, one drawn from the psychology of the individual and the other from a general view of the economy:

(i) monotonous work is more acceptable than is sometimes thought. Many workers, particularly women, do not want work which involves intellectual effort;

(ii) the organization and method can obviously claim the justification of efficiency. It generates high productivity, reduces cost-prices and makes for mass production available to all. It has therefore acquired a true historical legitimacy. It does have the disadvantage of splitting work up into small tasks, but there are countervailing advantages which, in the last resort, outweigh the disadvantages: a very rapid growth in productivity means that wages can be increased, and thus consumption levels, and that working hours can be reduced.

In addition to these two arguments, the defenders of the system also claim that assembly-line work in fact accounts for only a small proportion of all jobs.

These arguments are not entirely ungrounded. But they are obviously not urgent enough to reverse present attitudes and there is clearly a widening gap between the traditional principles of O and M and the aspirations of today.

(1) As O and M could be accepted at a time when the proportion of a given age-group still at school was fairly low, so today it is less acceptable when those who have to suffer its effects have had a longer schooling (2).

(1) cf. Report by Mr. Yves Delamotte "Recherches en vue d'une organisation plus humaine du travail industriel", published in March 1972 by Documentation française.

(2) In this context, it would be of interest to draw up a statistical table showing, for certain industrial countries, trends in the average length of schooling for a given age-group over the last twenty or forty years (cf. Annex IV, Rising school attendance between 1920 and 1973 in France).

The contradiction is obvious: our society, thanks to the economic progress which it has accomplished, makes a higher level of education available to most of its members, but continues to offer a very large number of jobs, which call for no personal initiative, no responsibility and no element of personal enrichment. Even though working hours are now very much shorter than they used to be and even though this trend continues, the fact remains that work is still the fulorum of human existence. Work cannot be regarded as a featureless void.

(ii) Many studies, of which one of the best known is that of Professor Frederick Herzberg ("The motivation to work", "Work and the Nature of Men"), have shown that the factors which contribute to work satisfaction are inherent in the task itself, whereas factors making for frustation lie in the context of work and the working environment. The whole working environment (health, wages, relations with management, and so on) can produce dissatisfaction and improvements are therefore necessary. Positive satisfaction does not derive from these factors, but from the response to the higher needs of man: the need for self-realization, for achievement and responsibility, the need to advance one's own capacities, and so on. It is obvious that O and M runs directly counter to these aspirations.

It is not surprising that wherever this system has been vigorously applied, protest against working conditions has been the most vigorous and disaffection from work has been the most evident. This is the case, for example, of the car industry, where in the last few years, the assembly-line workers in certain European countries have been increasingly replaced by immigrant workers. There is also a growing proportion of women employed in repetitive jobs. Similarly, certain firms have in fact set up manufacturing works based on this type of job in the underdeveloped countries.

Most attention has of course been given to the extreme example of O and M, assembly-line work. Defenders of the system are right in their claim that this type of work represents only a small fraction of industrial employment and therefore of all employment. But it should be pointed out that this system, in the form of a greater or lesser degree of specialization, has thoroughly penetrated many other sectors besides those actually using an assembly-line. Mention has been made of O and M in the tertiary sector. Both in industry and in services (distribution, banks, insurance), there is a high proportion of repetitive and subdivided tasks. In France, the number of O and M designed jobs rose between 1962 and 1968, as well as the number of employees, which goes to show that the modern economy is not characterized only by a trend towards higher levels of qualification for jobs.

Although there are very few statistics which offer a comparison over a period of time and from one area to another, it would seem that the proportion of unskilled jobs involving repetitive tasks and no real initiative has not fallen over the last few years. A statistical study in this matter would be of the greatest interest.

B. the effort to achieve maximum investment and consumption

The intensive effort to develop investment and consumption - one of the major features of our model of growth - has had a duel affect in the emergence of the problem of working conditions.

(i) in the constant tug-of-war between the requirements involved in the improvement of working conditions and those of productive investment and consumption, the second aim has tended to prevail.

(ii) As a result of this tug-of-war, a contrast has emerged between the condition of the individual as a worker and the individual as a consumer.

Historically, when Henry Ford was the first to develop large car production lines, he established a link between the resulting increase in productivity and the increase in wages made

possible thereby. He thought that this would create a large demand affording increased outlets for production which would itself constantly increase. This method was certainly indispensable at the beginning of the industrial era. It was the only way to start production rolling. Pursued in a systematic fashion in the name of a sort of industrial imperialism, it led to a constant pressure to increase productivity and hence to maintain a high level of rigidity as regards working conditions, from the point of view of both the rhythm of work, hours of work and the working evironment. The will to raise the standard of living and seduction by consumer goods, stimulated by innovations and publicity have led people in all walls of life to focus their attention increasingly on growth and the accumulation of goods rather than on improving working conditions. Of course, it is difficult to demonstrate scientifically that there has always been a tug-of-war of this kind. There are very few examples as explicit as those in France which have emerged in the preparation of certain plans (this was the case for the Sixth Plan covering the 1971-75 period); the public authorities and both sides of industry indicated their preference for more rapid expansion of production at the expense of a more significant reduction in working hours. However, it must be stated that in the long term and in the majority of industrial nations investments have been aimed primarily at increasing production and to a very limited extent at improvising working conditions.

As a result, the rate of progress has been much more rapid as regards consumption than as regards working conditions. Techniques capable of reducing the worker's load have taken the back seat in comparison with techniques which enable productivity to be increased.

Considerable research work has been carried out and financial aid has been given for the latter aim without hesitation, but only a limited amount of specific measures have been taken as regards the former. Improvements in working conditions have been the by-products of better production techniques. Consequently, it is not surprising that there is now a contrast between the individual as a consumer and the individual as a worker; this contrast cannot but accentuate the need to transform working conditions.

Outside work, the individual has greater material comfort in the home. The omnipresent mass media flatter his libertorian instincts. They entice him with a wealth of comforts and offer him attractive prospects of a better standard of living, a better level of culture and better jobs. Conversely, at work the individual is hemmed in by discipline and a cumbersome hierarchy; he loses his independence. At work he often finds an environment dominated by ugliness, noise, heat and smells. His job may be insignificant and offer him no outlet for asserting his abilities and putting them to use. It is understandable that, as a result, he should aspire to make radical changes. This aspiration, which was easily tolerated at the dawn of industrialization in a society of scarcity is no longer tolerated in the "affluent" society. With good reason his motivation is directed towards higher requirements. Moreover, the economy of a developed society offers a wider spread of choices as regards jobs.

It offers a wide variety of activities. It is only natural that a comparison should be made between jobs and activities and that disputes should arise in cases where working conditions appear particularly arduous.

When growth was regarded as a worthy goal in itself its rigours were more easily accepted. Conversely, now that there is no longer a consensus of opinion regarding the benefits of growth its adverse effects on work are being challenged. Work is carried out within a social system. Attitudes to work must be part of the collective vision of this system. Two hundred years ago work was regarded exclusively as an obligation, a fact of life in a fatalistic world. People today require greater independence: work too must be endowed with responsibility and freedom.

C. The effects of concentration and urbanization

Increased sensitivity to working conditions is probably also linked with two other features of recent economic development: concentration and urbanization.

Although it is difficult to lay down a general rule it can be assumed that working conditions as a whole are better in large firms than in small ones.

But is is also possible to put forward a proposition (which does not contradict the preceding affirmation) that large firms tend to make people more hostile to work. Large firms usually have a complex structural organization and a more cumbersome and more impersonal hierarchy. Communication is more difficult, and the workers' involvement in the aims of the firm is more intangible and more abstract.

In place of involvement in the interests of the firm the worker must accept a management system, in other words technical rules based on ratios expressing economic rationality. It is certainly true that, particularly as regards managerial staff, the problem of working conditions in this day and age is part and parcel of the ways in which power is exercised within the firm.

Urbanization, resulting from the concentration of activities, cannot but serve to make the problem of working conditions more acute. Of course, the situation varies a great deal from case to case. Examples can be given for all the countries of cases where, as a result of decentralized investments, employment has been created in the centres of population and industrial development has made it possible to offer better housing. But it is also certain that in many cases work-induced fatigue is compounded by the tension of living a shabby urban life involving a long and weary journey to work. Where some commuters are concerned, the reduction in working hours obtained in recent years has been less than the increase in their daily travelling time. It would be particularly interesting to study a few large centres of population in order to assess trends in the distance between home and work (1).

The crisis regarding work which has arisen in our industrial societies is a consequence of the development of education and information, the effect of putting too much emphasis on profit, investment and consumption, a reaction against some of the ways in which power is exercised within the firm and against the apparent deterioration of urban life and a direct function of the general trend of growth. The outcome of this is that the guidelines which must be worked out for the future cannot be separated from attempts to find ways of controlling growth. Working conditions cannot be regarded simply as a technical question internal to the firm.

II. Guidelines for the future

The transformation of working conditions is an essential requirement of social development.

Clearly, this requirement can be met only by a policy covering all the aspects involved. The measures to be taken must, therefore, involve the State and both employers and employees in other words trade unions and employers' organizations. The volume of work to be accomplished will entail a long-term effort; the urgency of the matter requires that the first steps be taken now.

While it is relatively easy to fix the objectives it is very difficult to propose the means of attaining them.

A. The objectives of a policy for transforming working conditions

Set out below are a few basic objectives; no attempt is made to attach any measure of priority to them.

(a) To promote health and safety

Health and safety represent a traditional aspect of the safeguarding of working conditions. All the countries adopted a number of standards in this field a long time ago. In many cases they were introduced through legislation and are monitored by the authorities.

(1) It should be noted that examples of great distances between home and work are not confined to large centres of population. When a very large production unit is built in a semi-urban region the amount of travelling involved is considerable. For example, workers come from 50 km to the Peugeot factories at Sochaux Montbéliard.

Some people maintain, not without good reasin, that the increasing number of health and safety rules and improvements to these rules are not without disadvantages as they tend to ease the conscience of the parties concerned, particularly the public authorities and employers' organizations who are inclined to imagine that these rules have mores or less solved the problem of working conditions. With good reason, trade union organizations attach great importance to the safeguarding of workers' safety and health. Statistics reveal that the number of accidents at work is still high (1). Although occupational diseases as such are rare, physiological studies show that certain jobs have a long-term adverse effect on the health of the people carrying them out.

Moreover, it is a known fact that the death rate is higher for manual workers than for managerial staff or people exercising a liberal profession (2). Thus, there is still a great deal that can be done to improve health and safety.

International studies and discussions would be very useful in this field.

(b) To enlarge and enrich jobs

Jons must allow the individual concerned to exercise his spirit of initiative.

Experiments concerning job enrichment and enlargement have been carried out in most European countries, as in the United States. As yet they are only tentative and it is difficult to make final conclusions from them.

It would be more interesting to draw up a list of them and to learn lessons from them. As a whole, they seem favourable as they show that productivity has been in no way threatened, that the initial investments entailed have not been very great and that the workers concerned would not wish to go back to the conditions as they were before.

(c) Self-determination of working conditions

The aim is to give workers, whatever their status, not merely more independence regarding their work but also the possibility of having a real influence on the organization of their working conditions. The main feature of organization and method as universally practised is that the working conditions of each worker are dictated by an outside authority. In a factory everything is organized and ordained by the planners. As far-reaching and practical a dialogue as possible must be introduced progressively regarding work organization at the different levels in the firm: workshops, factories, offices, shops. Eventually, dialogue should also concern rhythms of work, workloads, equipment design or the way in which equipment is used and the design of work places (3).
An examination would have to be made of how to adapt institutions and procedures for discussion between the parties concerned at the various levels. In general, investment projects should be the subject of consultation with employees' representatives, if possible the representatives of those who will be called upon to take part in these projects. It is of course easier to incorporate the social dimension into new plant than into existing infrastructure.

(1) See annexe n° 1 concerning statistics relating to industrial accidents in France over the period 1950-70: even allowing for the activity index there is a clear increase in the number and the seriousness of these accidents.

(2) See annexe n° 2 on the death rate in France by socio-professional category.

(3) Of course the opportunities for setting up such a dialogue are closely dependent on the nature of relations between employers and employees. The difficulties involved should not be hidden; this dialogue could equally well lead to a Malthusian attitude on the part of employees (refusing to accept any change in working conditions) as to an excessively authoritarian and firm attitude on the part of the management (refusing to accept the consequences of consultations; in other words changes in their projects).

Self-determination entails the availability of variety of choices regarding the work of each individual. The traditional concept must be reversed or at least supplemented: no longer should the individual be adapted to the job but jobs should be created which are adapted to the aspirations of the individual. In this respect, it is certainly justifiable to attack the excessive rigidity of our system of work organization: everyone working to the same timetable and for the same working hours and the same age for starting and finishing working life. Experiments have also been carried out regarding flexible working hours and part-time work. It would be useful to compare these experiments. It is conceivable that they may have certain disadvantages, which explains the reticence on the part of trade union organizations; one example would be the down-grading of part-time jobs.

The arbitrary sub-division of human existence into three phases, in the first of which one has the right only to study, in the second to work and in the third to retire and to take no further part in working life is against the aspirations of the individual. Although it is a known fact that people are living longer, and medical and psychological studies have shown the adverse effects of a sudden break from working life, no serious effort has yet been made in any country to make it possible for the individual to move gradually from working life to retirement. It is a known fact that different people have different rhythms of work, different capacities and different desires regarding work. In social terms the work organization system is not very diversified. The fact that part-time work is less highly thought of belies its social utility. As Mr. P. MORIN pointed out in a recent study, "There is no reason why our industrial societies should not attain the same degree of diversity and complexity in the field of work as they have achieved in the field of technology".

(d) To create more humane production units

Fresh thought should certainly be given to the size of modern production units. Not only do they serve to make communication more difficult but also tend to increase the distance between home and work.

(e) To upgrade manual work and increase equality of opportunity regarding promotion

It will be impossible in the indeterminate future to eliminate the boring and tiring tasks characteristic of most manual occupations. In addition to wage inequality there is in our societies another inequality which is just as basic: inequality regarding job interest. It is unacceptable that manual work should be considered less highly than work involving intellectual effort. Three steps must be taken in order to attenuate this situation: firstly manual jobs must be better paid; this presupposes that in certain cases a more restrictive policy should be pursued regarding the employment of foreign workers: secondly, as indicated above job content must be enriched and enlarged: lastly, there must be greater opportunities for promotion and hence training. Experience shows that manual workers and office workers have the least opportunity for permanent education (1).

B. The means of progressively transforming working conditions

It is difficult to define the means of achieving a policy to transform working conditions. Long-term measures are involved and these measures will inevitably vary from country to country and according to each sector and firm.

The greatest possible allowance must be made for the social context - particularly the attitudes of trade unions and employers' organizations - and technological or economic constraints. The only aim of the suggestions made below is to illustrate by means of a few examples the sort of measure which could be envisaged in the first stage.

1) Examples of action to be taken by firms

A multiannual plan for improving working conditions to be drawn up by firms and submitted to their staff consultative bodies. If necessary this plan could be the subject of an annual or multiannual agreement. It should concern every branch of the firm and be based on precise technical indicators: noise levels, high temperatures, various sorts of pollution and the number of work places affected by this pollution.

(1) In France in 1972 only 6% of workers and office workers followed training courses as against 24% for all supervisory staff, technicians, engineers and managerial staff.

A social report to be submitted by firms to the whole of the staff concerning action taken in the preceding year. This report could be published in a number of ways and include some compulsory information: the number of accidents at work, turnover, absenteeism, the number of works doctors, expenditure on training, expenditure on improving working conditions and the working environment and internal promotion. In good time a whole range of social indicators should be obtained which would make it possible to draw up social "accounts" for the firm.

The health and safety budget could be discussed each year with the staff representatives, and, where necessary, all or part of this budget could be administered by the parties concerned.

The staff would have to be consulted in advance concerning factory extensions or new buildings in order to have their say regarding the design of working conditons.

2) Examples of action to be taken by the State and by both sides of industry (collective bargaining)

- Research, systematic study and pooling of experiences in working conditions. A useful step has been taken in this direction in France with the creation, by a law of 27 December 1973, of a national agency for the improvement of working conditions.

- There should be much more research in ergonomics.

- Launching of a policy for training in working conditions.

  The training programmes offered by engineering and technical schools should be reviewed to ensure that they include ergonomics and in general all techniques relating to the organization of work.

  Permanent training should lay considerable stress on the understanding of the problems of work. Shop-floor leaders, who are often recruited from the general workforce and who are of central importance in social relations at the base, should have priority access to this type of training.
  Too little emphasis is often given to industrial medicine. It should be given greater importance and perhaps official status, which would guarantee its independence (cf. Annex III).
  To begin with, in order to mark the determination of the State, it might be advisable to set aside interest-subsidised public loans to firms which decide to make investments which point the way and introduce innovations to improve working conditions.

3) Need for Community action

It should not be ignored that no significant change in working conditions is possible without a change in emphasis more favourable to social priorities compared with the accumulation of capital and the wish to devote the most substantial effort to production and consumption. While social efficiency and economic efficiency should not be set against each other, it cannot be denied that an active policy to improve working conditions will necessarily entail extra costs for the firms themselves or for society. It is clear that in a market without economic frontiers - a vast area of competition - no State can take the step of compelling its firms to comply with social obligations which would put it at a competitive disadvantage. Beyond a certain point, States, like firms, lose their autonomy of action in social policy. At the extreme limit, international competition can slow down or even put a halt to attempts at social innovation.

As every firm has to keep a close watch on its costs compared with those of its main national and foreign competitors, no genuine or far-reaching change in working conditions will come about unless the process operates at much the same rhythm in all the countries of the Community. To take but one example, each of the major car firms in the EEC would have to endorse extreme caution in reconsidering assembly-line work unless all its competitors followed a similar policy. Improvement of working conditions is therefore an area par excellence for Community action.

Europe of the Nine offers a setting at once unprecedented and necessary for the launching of a bolder policy for changing working conditions. This idea was given formal expression by the Conference of Heads of State or Government hold in Paris in October 1972. One of the first practical results is the plan to establish a European Foundation for the Improvement of Working Conditions. This foundation will certainly be able to play a major role for both stimulating and coordinating research, pooling experiences and even promoting certain pilot projects. But we must go even further. The EEC ought to be able to promulgate certain Community regulations which would eliminate or progressively adjust certain alienating forms of work such as piecework or single-task jobs. And why not also consider attacking the problem of assembly-line work? In the field of this new foundation, a group of "wise men" could be asked to produce a report on this question, which could then be discussed by the governments and by both sides of industry within the Community's Institution. The European Social Fund could perhaps be asked to make a financial contribution to certain experimental projects.

It may be objected that the wish to eliminate at some stage all assembly line work is utopian. But in fact, when we reflect on the speed of change of our society, it is utopian to try to preserve dehumanizing forms of work. Perhaps the next generation will regard today assembly-line work in the way that we regard the employment of children under the age of 14 in the mines of the 19th century.

It may also be objected that the European Community is itself in competition with other industrial powers and that it cannot afford to advance too boldly on the social front. This would be to underestimate the extent to which Europe could prove to be a pioneer. The improvement of working conditions corresponds to a historical necessity from which no industrial nation can escape. In any case, Europe has no meaning unless it serves the true purpose of our society, that of generating a human society capable of being the master of the economic process, and not to be submitted to it.

At a time when the world economy is entering an era of difficulties, is it realistic to believe that working conditions will be regarded in the next three years as an essential problem? If expansion is profoundly and permanently undermined, will not the defence of employment itself win the day over claims regarding quality of work? Here, it is significant that the new awareness of the importance of the quality of work has in most countries come into being in the period 1968 to 1972, that is during a stage of rapid growth by all the industrial economies. Even if economic development can accentuate or mitigate demands for better conditions of work depending on the period, this demand so immediately expresses a historic necessity that it cannot but make itself continuously felt.

The ups and downs of the economy will not remove the inevitable necessity to find a way out of the obvious and increasingly growing contradiction between the level and content of the jobs on offer, and the level of skills and qualifications obtained by the working population. A democratic society, cannot allow itself to be Malthusian and restrictive as regards access to knowledge and education. We must therefore rethink both the content and the environment of work in order to adapt it to the capacities and the expectations of those performing it. Nor can a democratic society allow a schism in the working world between those who take part in creative efforts and who thus find the opportunity for personal development and progress, and those who are merely the extension of the repetitive movement of a machine. The world of mankind is indeed not limitied to work: but work is a fundamental and distinctive mark of man in society.

ANNEX I

Statistics of accidents at work in France

(Source: INSEE)

Ordinary accidents at work (entailing a stoppage of 24 hours or more)

	1950	1954	1958	1962	1964	1965	1966	1967	1968	1969	1970
Total (in thousands)	921.0	975.8	1,056.7	1,071.5	1,195.1	1,154.4	1,140.3	1,098.8	1,028.3	1,085.5	1,107
of which:											
Metal trades	328.5	335.6	365.9	354.3	368.4	344.7	335.5	315.1	285.2	312.0	324
Construction	208.0	234.5	282.5	295.7	349.7	348.5	338.1	332.6	316.3	320.6	325
Food industry	47.9	69.1	72.4	82.2	92.1	89.5	90.7	89.4	84.9	85.9	85
In indices (1954 = 100)	94.4	100	108.2	109.8	122.5	118.3	116.8	112.6	105.9	111.2	113
of which:											
Metal trades	97.9	100	108.9	105.5	109.8	102.7	100.0	93.9	85.0	92.6	96
Construction	88.7	100	120.5	126.1	149.1	148.6	144.2	141.8	134.9	136.7	139
Food industry	69.3	100	104.8	119.0	133.3	129.5	131.3	129.4	122.9	124.3	124
Serious accidents at work (entailing the granting of a pension)											
Total (in thousands)		64.6	78.7		107.7	108.8	109.6	114.8	106.9	106.0	108
of which:											
Metal trades		18.1	22.7		29.7	29.4	28.8	29.4	26.2	26.2	27
Construction		16.5	21.0		30.6	32.1	32.7	34.8	32.8	32.4	33
Food industry		4.5	5.5		7.5	7.7	7.7	8.2	7.8	7.7	7
In indices (1954 = 100)		100	121.8		166.7	168.9	169.7	177.7	165.5	164.0	167
of which:											
Metal trades		100	125.6		164.1	162.4	159.1	162.4	144.7	144.7	150
Construction		100	127.3		185.4	194.5	198.2	210.9	198.8	196.4	200
Food industry		100	122.2		166.7	171.3	171.3	182.2	173.3	171.3	168
Deaths due to accidents at work											
Number	1,643	1,782	2,065	2,100	2,188	2,123	2,182	2,114	2,038	2,227	2,284

Accidents sustained while travelling to and from work

In thousands	65.3	107.2	136.7	169.2	194.0	180.5	180.7	170.2	162.3	164.3	
Index of activity for wage earners											
1954 = 100	96.8	100	106.9	109.7	113.5	112.4	112.8	111.4	109.2	110.1	110
Index for the regulativity of accidents at work											
1954 = 100											
ordinary	97.5	100	101.2	100.1	107.9	105.2	103.5	101.1	97.0	101.0	103
serious		100	113.9		146.9	150.3	150.4	159.5	151.5	149.0	152

Sources: Statistiques nationales d'accidents du travail de la Caisse nationale de l'Assurance maladie des Travailleurs Salariés.

Ordinary accidents are those entailing a work stoppage of at least a full day in addition to the day of the accident.
Serious accidents are those which involved the granting of a permanent disablement pension or death.
Accidents occuring in special sectors (public administration, mines, public transport) are not included.

A N N E X II

Life expectancy of each socio-occupational group at the age of sixty

Survey of the population of France carried out by INED (average for the years 1960 - 1965)

Occupational group (males only)	Number of years of life after the age of sixty
Primary teachers in the public sector	18,6
Liberal professions and senior management	18,1
Catholic clergy	17,4
Middle management in the public sector	17,0
Technical staff in the private sector	17,8
Middle management in the private sector	17,2
Skilled workers in the public sector	17,0
Foremen	16,3
Farmers	16,0
Office workers in the private sector	17,0
Tradesmen, craftsmen	16,9
Office employees in the public sector	16,4
Specialized workers in the public sector	15,9
Skilled workers in the private sector	14,9
Specialized workers in the private sector	15,0
Agricultural workers	14,9
Unskilled workers	14,7

Average for the whole of France 15,9

This table clearly shows that life expectancy at the age of sixty is lower for workers (cf, in particular skilled workers) than for the liberal professions and managerial staff.

ANNEX III

The shortcomings of industrial medicine in France

The works doctor, more than anyone else, can play a significant part as regards working conditions, to both management and labour, in that he can give an authoritative opinion on the psycho-physiological aspects of working life. He can play an important preventive role with regard to occupational diseases. He can also give advice on general measures which go beyond the immediate hygiene and safety angle and involve every aspect of the physical and mental health of the individual. The training of a large number of highly qualified works doctors is therefore of paramount importance.

The teaching of industrial medicine is currently passing through a serious crisis which is jeopardizing the future of that discipline.

Firstly, a growing dislike for this specialised field is developing among medical students they receive insufficient incentives during their medical training to branch out into this type of medicine.

The way in which the teaching of industrial medicine is at present organised in the medical training and research units does not enable the students to be adequately informed on the interreaction between work and health.

It is, however, absolutely imperative that such information should be given, as it enables:

- future general practitioners and specialists to realize the importance of the effects of working life and working conditions on man's health;
- the medical student to be encouraged to take up a career in the social field.

A recent reform of medical training has resulted in less emphasis being placed on industrial medicine:

- before that reform was carried out, students were required to follow sixty hours of courses in industrial medicine and to take a special examination in that branch.

Following the reform, even the term "industrial medicine" has disappeared from the compulsory syllabus. In most training and research units a few hours of lectures have been set aside for this branch, leading to a certificate for "Preventive and social medicine, medical economics".

The number of teachers with industrial medicine as their speciality is notoriously inadequate. In the case of university establishments, for example, of the 44 present medical training and research units in France with a total of 2.579 teachers, only 17 teachers have specialized in industrial medicine and there are only four "Chairs" of industrial medicine (the other posts are for a mixture of branches, mainly connected with forensic medicine). Of the 1.654 posts open for recruitment from the list of persons eligible to take up posts as "Maitres de Conférences Agrégés" during the past four years, only eight were allocated to the field of industrial medicine.

Hospitals, which still concentrate on the curative function should become more involved with social medicine.

Secondly, far too few works doctors are recruited. Only one out of every fifteen candidates for the social studies certificate which opens the door to a career in industrial medicine chooses industrial medicine as a profession. Almost all of the candidates regard that certificate as an "insurance for the future" in case they should need to retire prematurely or the number of patients on their books should decline. Although there are more than 5.000 works doctors in France, the requirements of undertakings are far from being met entirely.

Thirdly, further training: post-university training and the new law on continued training should enable works doctors to improve their knowledge or to specialize in certain branches of industrial medicine.

Compulsory retraining, at regular intervals, should be introduced for works doctors.

This "under-development" of industrial medicine is a reflection of the values which governs our economy and our society.

A N N E X IV

TREND OF SCHOOL ATTENDANCE IN FRANCE

	1920-1921	1945-1946	1959-1960	1972-1973
10 years	98 %	98,5 %	99,9 %	100 %
13 years			97,1 %	98 %
14 years	25 %	43 %	69,2 %	93,8 %
15 years			54,4 %	87,3 %
16 years	15 %	26 %	45,1 %	67,1 %
17 years			29,2 %	50 %
18 years			18,2 %	33,5 %
19 years	3 %	6 %	10,8 %	22,5 %
20 years			7,1 %	15 %
24 years			2,2 %	5,9 %

WORKING PAPER FOR GROUP I

"IMPROVEMENT OF WORKING CONDITIONS: THE ROLE OF INDUSTRIAL DEMOCRACY"

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The Role of Workers' Views and Aspirations

Consideration of the improvement of working conditions (1) must take into account the involvement of workers in the life of the enterprise, and must proceed on three propositions:

(i) the views of workers (what they want and what they do not want) must be given a cardinal role;

(ii) workers' views must be supplemented by scientific knowledge;

(iii) improvement of working conditions and involvement in the life of the enterprise do not cover the whole of workers' aspirations in modern industrial society; effective handling of these problems may contribute to, but can never substitute for, resolution of wider industrial relations issues, including the distribution of income, wealth and power, and the place of labour in the community.

(i) Workers' views on working conditions, and their involvement in the life of the enterprise are not static; what is regarded as an impossibly high standard of aspiration today becomes accepted as a matter of course tomorrow. Physical working conditions in today's factories and offices would have been considered luxurious a generation ago, but are now taken as normal. Rising standards of living and aspirations, steadily extended by the mass media and the crumbling of barriers of class and prestige, raise expectations and continuously widen the horizon of workers' claims.

Once it is accepted that "labour is not a commodity" there is no a priori limit to the aspects of working conditions and the life of the enterprise which workers may aspire to influence.

A particularly important feature is that workers' aspirations are not restricted to the substance of working conditions; they also concern the procedures whereby decisions are made about substance. Involvement of workers and their organizations in decision-making about working conditions must be given an importance equal to that of the substantive improvements themselves.

(ii) Workers' views, however, are not the whole story. Just as in everyday life we may not eat the diet that is best for us, owing partly to ignorance and partly to custom and individual preference, so workers' approach to working conditions may not necessarily be what is best for them. Scientific knowledge, based on objective ergonomic research, must complement the claims of workers, especially where these take the form of a desire for extra money in compensation of dangers, unhealthy or unhygienic conditions. Scientific evidence can also help to some extent to reconcile the conflicting views between various groups and types of workers, which reflect differences of custom, experience and individual preference, as well as possible conflicts of interest arising from specific actions to improve working conditions. (For example, the enrichment of one man's job may, in certain circumstances, lead to impoverishment of others'.)

(iii) Improvement of life on the job is no substitute for higher income, for a more just distribution of wealth and power, or for a status and role in the community consistent with man's aspirations to freedom and human dignity. While welcoming improved working conditions and greater involvement in the life of the enterprise, workers are not prepared to take these as a replacement for their other claims, and demand that they should have a voice in determining the relative priority to be given to such improvements and to various aspects of them. (Thus workers offered a change in job design that gives greater opportunities for job satisfaction, may consider improvement of physical working conditions more urgent) (2).

(1) Throughout this paper "working conditions" will be used to include work organization.

(2) Expériences en vue d'une organisation plus humaine du travail, (Librairie Armand Colin, Paris, 1973), pp. 73-74.

The three propositions discussed above have important implications for practical programmes for improved working conditions and a greater involvement of workers in the life of the enterprise. Such programmes must provide for the expression of, and consideration of workers' views and must give workers a role in decision-making on these matters. The work of scientists on the improvement of working conditions and methods of work organization will only be viewed as objective if it is sponsored and carried out in a manner that gives workers and their organizations an acceptable share in the conduct of the research and in the application of the results.

Programmes for improvement of working conditions and greater involvement of workers in the life of the enterprise will have limited impact if they are intended, or seen to be, a substitute for action to meet labour's other aspirations.

Means of Improving Working Conditions and Involving Workers in the Life of the Enterprise

The history of industrial society traces workers' struggle to involve themselves in the decisions that affect their working lives, by a variety of means. Such means include the development of workers' organizations of their own choosing, as a countervailing power to that of employers, managers and other groups in the community. Political activity, through formal or informal association with various political parties, has been another means whereby workers have obtained legislation giving effect to some of their aspirations. Through collective bargaining and/or legislated changes in the organization structure of the enterprise (such as works councils, employee directors, etc.) workers have sought to influence an ever-widening range of decisions within the enterprise. In addition, in the daily life of the enterprise workers may, by individual or collective action, establish customs and practices in co-operation with or in defiance of management, which may have considerable effects upon the life of the enterprise.

To a large extent the various means by which workers have sought to be involved in the decisions that affect their working lives can be regarded as attempts to brigde, or even to remove, the gap between workers and others in the enterprise that is implied by traditional concepts of enterprise organization and management. Such traditional concepts view the worker as the person who carries out the decisions of the management, which is supposed to do all the planning, organizing and decision-making.The management, in turn, is expected to carry out all these functions solely in the interest of the owners of the enterprise, whether they be private shareholders or the public. Reality has already moved a long way from the over-simple picture implied by the traditional conceptions. In particular, the interests of other "stake-holders" in the conduct of the enterprise, including its employees, have been increasingly recognised by legislation curbing the power of managers to exercise their functions without limit.

A more realistic conception of the enterprise views it as a coalition of partially conflicting and partially congruent interests between its members. The life of the enterprise, according to this conception, necessarily involves conflict and accommodation between various competing interests as well as co-operation. Such a view of the life of the enterprise is consistent with the obvious fact that workers and their organizations have sought to involve themselves in the decisions which affect them by conflictual as well as by co-operative means.

Perspectives on Industrial Democracy

The concept of "industrial democracy" has many different meanings. Basically, it implies that workers have a greater share in decisions that affect them. This fundamental idea may, however, be seen in a variety of perspectives by various groups, reflecting different objectives and fears. Figure 1 shows nine such different perspectives, and the expected results of improved working conditions and greater involvement implied by each.

Such different perspectives reflect ideological emphases, but they also express concern for three basic problems of modern industrial organization:

(i) power-sharing between workers and their organization on the one hand and managers, employers, shareholders, etc. on the other;

(ii) achievement of effective co-operation in daily running of the enterprise;

(iii) provision of opportunities for members of the enterprise to gain satisfaction and fulfilment from their association with it.

Improvement of working conditions may likewise be approached from one or more of the various perspectives shown in Figure 1, and may be regarded as a contribution to the solution of the three basic problems of work organisation listed above.

The solution of each of these problems may be advocated as an end in itself, or as a means towards some wider objective. Particular approaches to improvement of working conditions and greater involvement of workers in the life of the enterprise may aim at coping with only one of these three basic problems, or may have the more ambitious objective of coping with two or even all three of them.

Thus industrial democracy is not a simple concept. It covers a great variety of institutional structures and processes. In addition to the fact that workers' involvement in decisions may be co-operative or conflictual, it varies in scope, degree and extent. By scope is meant the range of decisions in which workers take part. By degree of involvement is meant how far workers influence decisions, which may vary from completely unilateral control by management to completely unilateral control by workers. By extent of involvement is meant how far involvement is spread through the work force of the enterprise. It may be restricted to certain categories of workers or by the fact that workers are involved indirectly through representatives, rather than directly.

Forms of involvement also vary in a number of ways. Involvement may be structural, ie provided in the formal organisation, or it may be informal, without any change in the formal organisation, for example, by the adoption of a "participative" style of supervision by managers. Involvement may be individual or collective and it may take place at different levels of the enterprise. At higher levels it will be concerned with the government of the enterprise, while at lower levels it will be more concerned with administration.

Workers may also be involved in the life of the enterprise through their own informal or formal organisations, which engage in negotiations with the management.

Distinct from forms of involvement in the life of the enterprise which give workers a share in the decisions which affect them, are forms of involvement which give workers a share in ownership or in the results of the enterprise (l'intéressement). Involvement of workers as citizens through public ownership of the enterprise in which they work appears to have relatively little effect on their personal involvement in the life of the enterprise. Likewise, participation in the profits or benefits of the enterprise does not necessarily give workers much sense of involvement in the daily operations of the enterprise.

Attempts to give Workers Involvement through Indirect Participation: Lessons of Experience

In many countries, of different political orientations, institutions have been established by law or by collective agreement, which are intended to involve workers in the decisions which affect them within the enterprise. Such institutions may be regarded as providing "structural participation". The important question is to what extent such institutional forms come to life and actually involve the workers in the life of the enterprise. Experience shows that significant gaps may exist between the prescriptions of law or collective agreements and what happens in practice. Experience also records considerable variations in the effects of such "structural participation" in different enterprises in the same country. Without understanding of the reasons for such variations, policy must rest on uncertain foundations.

The factors determining the extent to which "structural participation" is translated into real involvement in the life of the enterprise can be divided into situational factors on the one hand and human factors on the other.

The situational factors include:

(a) the autonomy of the enterprise;
(b) technological factors;
(c) the size of the enterprise;
(d) the organisation structure of the enterprise.

Clearly, if the principal decisions are made above the level of the individual enterprise, workers are not likely to become much involved in the life of the enterprise. Limited autonomy of the enterprise places limits on workers' involvement.

Technology influences the nature of the decisions available for sharing and also the potential degree of involvement. Technologies differ in the amount of tolerance that can be allowed in the performance of a task, or in the scope for delay while matters are discussed or negotiated. The location of the enterprise, the character of the work, and the conditions under which it is performed affect the ease with which workers may communicate with each other and the extent to which they are conscious of having common interests, thus affecting the potential extent of involvement. Important differences in the industrial relations behaviour of work groups using different technologies have been reported.

Methods of payment may also influence the potential for workers' involvement in the life of the enterprise. While workers paid by results supervise themselves to a certain extent, such systems of payment are often accompanied by job design that removes much of the discretionary elements from the work, thus restricting workers' involvement in their own work and work situation.

Smaller enterprises tend to have less rigid administrative and work procedures, and less impersonal supervision, thus attracting some workers who prefer such a work environment, which offers them greater opportunities for involvement.

The organization structure of the enterprise may be controlled by law, but is is also much affected by its autonomy, its technology, and its size. Environmental factors also have an influence. Enterprises in stable environments tend to adopt "mechanistic" types of relatively static, rigid and sharply defined authority structures. In more volatile environments enterprises tend to evolve "organic" forms of organization of a more fluid character better suited to the need for constant adaptation.

The human factors affecting the extent to which "structural participation" produces active involvement of workers in the life of the enterprise concern workers and managers. Three factors concern the workers:

(a) workers' attitudes and objectives;

(b) workers' perceived power; and

(c) workers' capacities to share in management decisions.

In general, research shows that the majority of workers favour the idea of workers influencing managerial decisions. A majority of workers also favours special instructions for workers' participation in management. A relatively small proportion, however, express interest in personally taking part in decisions on the general management of the enterprise. A much higher proportion of workers are interested in sharing in decisions directly affecting how their work is done and what goes on in their own work situation. A substantial proportion desire more interesting and challenging work involving more planning and decision-making.

Evidence shows that it is unwise to assume a universal desire among workers to share personally in all decisions, and that older, more educated and more skilled workers tend to be more interested in such decisions, as do men rather than women. Workers at lower levels of the enterprise tend to have only a "calculative" involvement with the enterprise. For many workers work is not a central life interest.

Account must also be taken of differences between attitudes of workers in different countries and in different groups in the one country. These are shaped by values and ideologies as well as by factors such as age, sex, skill, education and experience. Some groups are opposed to any involvement in the enterprise at all.

In most countries workers' knowledge of the practical working of participative institutions is not very great, even where considerable efforts are made to keep them informed. Absence of such knowledge does not, however, imply lack of support for the institutions concerned and it is perhaps not greatly different from the lack of knowledge of the average citizen about matters of government and politics generally.

Whether workers who desire to be involved in the life of their enterprise will try to involve themselves in practice depends on how much power to do so they believe they possess. If workers (or their representatives) believe that a particular institution does not give them enough power to share in decisions to the extent that they wish, they become apathetic towards it and may turn to other forms of involvement. An example of this is the decline of

separate joint consultative machinery in Great Britain, owing to workers feeling that it dealt with peripheral matters only, such as "tea, towels, and toilets".

Account must also be taken of workers' capacities to involve themselves effectively in the decisions that affect them. If workers do not understand the issues involved, and are incapable of expressing their understanding persuasively, their impact on managerial functions will be limited to a veto or to a random effect, no matter how strong their wish and power to share in such functions.

It is widely recognised that workers can contribute effectively to decisions on matters such as terms of employment, plant rules and discipline, and welfare programmes. On practical aspects of production the people who do the work often have important contributions to make, which are not always recognised, even though they may carry implications for wider issues such as the design of equipment and plant layout.

Workers' capacities to involve themselves effectively in the life of the enterprise can be increased by training and experience. A necessary condition of increasing workers' involvement in the life of the enterprise is provision of appropriate training. The role of managers involves similar human factors. Managers, like workers, have attitudes that are more or less favourable to workers' involvement in the life of the enterprise. They also have perceptions of managers' relative power, and they vary in their capacity to manage in a manner that will involve workers effectively in the life of the enterprise.

The necessity for training of managers, in order to increase their capacity to involve workers in the life of the enterprise, needs continually to be stressed. Managers cannot be expected to adapt suddenly to an unfamiliar form of organization and decision-making.

Common Problems of Participatory Institutions

(a) Relations between Participatory Institutions

Each participatory institution has its own functions. It cannot be assumed that any particular institution can necessarily perform the functions of others.

Participation in the board room, for example, has little effect upon daily life on the factory floor. Indirect participation of workers through their representatives on works councils, or through collective bargaining at the industry level, does not in itself give the individual worker active personal involvement in the decisions which affect him, or autonomy in his job.

It is increasingly recognised that no single institution can provide for the whole range of participative processes, and that what is required is a network of participatory institutions, each playing its own role in a coherent manner.

It is nevertheless true that the operation of one form of participation inevitably interacts with other forms. In Great Britain, for example, the earlier concept of joint consultative committees to deal with matters not the subject of collective bargaining has been giving way to the notion of a "single channel", through which representatives of the workers both consult and negotiate with management on the whole range of issues of interest to the workers. In France the comités d'entreprise, particularly in small firms, are taking on more and more of a negotiating role. Such negotiation has also been developing in The Netherlands. Innovations in work organization at the level of the workshop tend to have a limited life and impact unless they are accompanied by participation at higher levels.

(b) Role-Conflict of Workers' Representatives

The basic issue here is whether workers' representatives are to play the role of expert or delegate. A representative of workers can act as an expert adviser on matters affecting workers' interests and on how workers are likely to react to various proposals. In this role he is no different from any other expert, such as those who might advise the management on financial or technical matters. If, however, he plays the role of delegate, he tries to induce management to take workers' interests into account. In this case his role is analogous to that of a major institutional shareholder which may have a representative on the board of an enterprise in order to safeguard his own interests.

If workers' representatives adopt the role of expert they run the risk that workers will regard them as having become managers. In the role of delegate, they are likely to be regarded by other members of the board as concerned only with matters which affect workers' interests, with the result that the board becomes an organ for resolving conflicts of interest between various groups.

(c) Effective Links between Representatives and Constituents

This problem is not confined to institutions for workers' participation in management, but occurs wherever people are represented by other people. The problem has been experienced acutely, however, when worker directors have been appointed rather than elected or have been separated from their trade union organizations.

(d) Effective Communication within the Enterprise

Although one of the objectives of many participatory institutions is to improve the two-way flow of communication in the enterprise, experience shows that this does not happen automatically. In Socialist and non-Socialist countries alike, even when considerable resources are devoted to trying to ensure that information is widely diffused throughout the enterprise, reality falls far short of aspirations.

The introduction of a new participative institution may change the pattern of communications in the enterprise. Works councillors and other representatives of workers will have more information than they had before, and may become better informed about management's problems and policies than middle-management. Members of the enterprise at intermediate levels may find themselves bypassed by the new channel of communication, with consequent effects not only upon their morale but upon their relative status. Thus such a new channel of communication may help with one problem only to raise another.

(e) Achieving Real Involvement within a Participative Body

This appears to be a problem in many enterprises, in both Socialist and non-Socialist countries. Workers' representatives may remain passive throughout the meetings of the participatory bodies, either through lack of interest or lack of knowledge of the subject discussed. Differences in customary modes of expression, and unfamiliarity with meeting procedures, may hamper effective interaction between workers' representatives and managers.

Given time and goodwill, such problems have been overcome in many participatory bodies. Appropriate training for workers' representatives and management helps considerably to solve such problems.

(f) Extending Involvement throughout the Work Force

In addition to the problem that arises in larger enterprises, of ensuring effective links between workers' representatives and their constituents, and an adequate flow of communications to all members of the enterprise, experience in Socialist and non-Socialist countries alike reveals considerable difficulty in getting all workers to participate, no matter what the structures and processes of participation available to them. Even in Socialist countries, manual workers are underrepresented in the participatory bodies, as are younger workers and those with shorter service. Unskilled manual workers are particularly underrepresented.

(g) Importance of Managers' Acceptance of Participation

In countries of widely different economic, social and political conditions, acceptance of participation by managers has proved to be a vital factor in the practical operation of participatory institutions.

(h) Importance of Congruent Objectives and Expectations

Where managers and workers have different ideas on what a participative institution should do and have different perspectives on the functions of such institutions, they will be working at cross purposes and confusion is likely to occur.

Assessing the Impact of Structural Participation

Such assessment is very difficult because of the problems of separating the influence of participation from that of other factors. Also, account must be taken of the extent to which the participation produces true involvement rather than mere formality. In these circumstances it is necessary to rely largely on the view of persons in a position to observe the practical working of structural participation, making allowance for the interests and biases of the persons concerned.

The popular belief that any participation by workers in managerial decisions must reduce the power of managers does not correspond to reality. It is possible that management, by gaining the co-operation of workers through participative structures, may reduce their opposition to managerial initiatives, thus increasing managers' power. Another possibility is that participation may increase the power of both workers and managers. If certain events in the enterprise are brought under joint control that were previously not effectively controlled by either managers or workers, the power of both may increase. A simple example is the increased control which both workers and managers may gain over safe working practices. Thus the effects of participation upon the power distribution in the enterprise may be quite complex. In addition to changes in the relative power of workers as a whole compared with the management group as a whole, there may be changes in the power of particular individuals or groups within the management or among the workers. Evidence indicates that, for example, power is likely to pass to the experts who have more knowledge of the subjects under discussion or are more effective in meetings, while rank and file workers and middle-management may find they have less power than before.

The enquiries made for the Biedenkopf Commission in the Federal Republic of Germany found that there appeared to have been no significant effect on management's freedom of initiative, nor any assertion of trade union power by coordinated directions from trade unions to workers' representatives on boards. Fears that workers' representatives would insist on selecting managers irrespective of their competence, and that Labour Directors would be caught in conflicting loyalties, were found not to have been realised in practice.

Yugoslav research on the impact of self-management upon the distribution of power within the enterprise reveals that "the hierarchical organization has survived within the new institutional shell of the democratic organization" (1). In Poland managers have been able in some enterprises to ignore the resolutions of the participative bodies, which in general have found it difficult to enforce their legal powers.

The general intention, when structural participation is introduced, is to foster co-operation and contribute to industrial peace. Experience shows that while this does happen in many cases, in others the participative bodies may serve principally as yet another arena of conflict. The effects appear to be much influenced by the general industrial relations situation and by the attitutde of managers and workers. Managers may emphasize the need for workers to accept management's objectives (2). Unions may emphasize contestation (3). Either of these approaches would need to be modified before true co-operation could increase.

The psychological effects of structural participation obviously depend on the extent to which the individual feels he is affected and his reaction to such effects. Presumably, workers who favour the idea of participation but are very poorly informed about the working of it in practice in their own enterprise, are not greatly affected by it. It is unlikely to increase their sense of personal involvement in the enterprise much, although it may contribute something to their sense of personal worth and self-respect. The psychological effect of structural participation, therefore, is likely to be greater upon those who actually take part in the participatory bodies.

(1) J. Zupanov: "Structural Conditions of the Employees' Participation: Some Unresolved Issues" in C.P. Thakur and K.C. Sethi: Industrial Democracy: Some Issues and Experiences, (Shri Ram Centre for Industrial Relations and Human Resources, New Delhi, 1973) pp. 294-295.

(2) See, for example, P. Hill: Towards a New Philosophy of Management (London, Gower Press, 1971) which speaks of the boss guiding employees "to commit themselves and their energies wholeheartedly to the objectives of the company in the task they undertake". (p. 44). The possibility that workers might have objectives of their own is ignored.

(3) The British trade union movement has stated that "collective bargaining is the only satisfactory way in which co-operation can be achieved" (Good Industrial Relations: A Guide for Negotiators, London, T.U.C. 1971) p. 7.

Where such participatory bodies work well their members are gratified. Members of some Polish workers' councils, for example, told research workers that "to represent the personnel gives satisfaction, it is a distinction" (1).

Where participatory bodies do not function successfully, members express frustration, and some researchers report them to be less satisfied than workers who are not members of such bodies. The most detailed research on this subject comes from Yugoslavia and concludes that "perhaps the most important finding is that participation in self-management should not be over-emphasised as a source of satisfaction. Even participants (in participatory bodies) ranked participation no higher than fifth in their list of desired job characteristics and participants felt more alienated than non-participants" (2). Frustration of participants in participatory bodies when these are not working satisfactorily has also been reported in French research (3).

The effects of structural participation upon efficiency are almost impossible to measure. The Biedenkopf Commission found that the German system of participation had had no negative effects upon efficiency. In Yugoslavia the introduction of self-management was thought to provide an incentive to efficiency and an improvement compared with the situation under centralised planning.

In general it seems that where participative bodies do not work effectively, they may merely waste time and reduce efficiency. Where their operation is lively, however, their impact on efficiency appears to be unlikely to be negative and in many cases may be positive.

Experience with structural participation in a number of countries, using different approaches, shows clearly that the process of putting it effectively into practice is far from painless. The transition from ideological programmes and objectives to practical effectiveness is a difficult one, for which considerable time and effort are required. Structural participation is clearly not a panacea for the human problems of industrial organization. Its effects are far from simple. There is no question of seeking a final verdict on structural participation from the record of practical experience to date. The verdict can never be final, for participation is not a fixed, static thing to be judged once and for all. It is a dynamic, evolving phenomenon, the full nature and effects of which can only be assessed over a long period.

Experiences and Problems of "Humanised" Work Organization

By "humanised" work organization is meant changes in the design of jobs and the relations between workers aimed at giving workers more opportunity to show initiative and take part in planning of their work and work situation.

Such attempts appear to involve two fundamental ideas:

(a) a reversal of the trend towards the division of jobs into smaller and smaller elements, each to be performed by a single worker, and its replacement by a trend towards putting together the various functions in a meaningful, integrated whole (in view of the fact that terms like "job enlargement" and "job enrichment" have come to be applied to certain specific aspects of this process, the term "job integration" would appear to be more satisfactory to describe this trend);

(b) modification of the hierarchical organization structure of the enterprise by arranging for workers to work together in small face-to-face groups, which have a good deal of autonomy, and whose supervisor no longer gives detailed orders, but sees that the group has the resources it needs and handles the group's relations with the rest of the enterprise.

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(1) IILS: "Further Data on the Operation of Workers' Participation in Management in Poland", 1971.

(2) J. Obradovic: "Participation and Work Attitudes in Yugoslavia", Industrial Relations, Vol. 9, No. 2, Feb. 1970, pp. 161-169.

(3) M. Legendre: "Quelques Aspects de relations professionnelles", Paris, Service d'Etudes pour le Développement et l'Animation, 1969.

In practical programmes aimed at humanising the work organisation these two basic ideas are expressed in various ways. Some of these programmes are limited to relatively minor changes in job content, or to the adoption of a "participative" style of supervision without any radical change in work organisation. Others go much further, implying a different concept of organisation, giving workers a voice not only in the design of their own jobs but in the planning and design of equipment and plant layout.

Although some of them have received considerable publicity, innovations in work organisation expressing these two ideas have as yet been restricted to a very small number of enterprises, in some of which only small sections of the work force have been affected. It is probable that more such innovations and experiments have been made than have been publicly reported, since some companies have preferred not to draw attention to such activities. Nevertheless, the proportion of the work force involved in such innovations so far must be very low.

Increasing interest is, however, being taken in "humanised" work organisation in more and more industrialised countries. This interest is manifested by management, the labour movement, and governments. International organisations have also taken up the issues.

The search for "humanised" forms of work organisation has not proved to be simple, but has raised many problems and wider issues that are fiercely debated. Some consider that industrial society is now coming to a turning point, when considerations of the quality of working life will be given an importance equal to, or even greater than, economic welfare and security. Those who hold this view believe that the search for "humanised" forms of work organisation marks a rejection of Taylorism and its replacement by a new concept of work organisation.

Others consider that the present interest in alternative forms of work organisation will soon fade away, that it is remote from the practical interests of more than a minority of workers, being a concern only of intellectuals and social scientists.

The objectives of management in introducing "humanised" work organisation are various. Difficulties encountered in recruiting young workers for industrial jobs, together with high rates of absenteeism and turnover, may play an important role. Humanitarian considerations may be a factor. In certain cases new forms of organisation have been favoured because they provided a flexibility of production and more rapid adaptation to variations, both quantitative and qualitative, in demand for the product. In other cases the constitution of small teams is seen by the management as offering a counter to the vulnerability of a large scale flow line which might be immobilised by the action of a few workers.

It seems unlikely that managements would favour innovations in work organisation if these imposed higher costs or reduced efficiency, unless the higher costs could be passed on in higher prices.

The attitudes of the labour movement to these innovations have been varied, and have evolved over time. In some countries the labour movement has shown little interest, or has expressed downright opposition, while in others trade union pressure has been an important factor in managements' decision to introduce such innovations.

Unions are uniformly critical of innovations introduced without consultation with them and their members. They also object when such changes leave certain problems unsolved, so that in their views the operation remains incomplete (for example, if the integration of jobs involving upgrading is not accompanied by revision of the wage scale). Some unions have objected to the policy of integrating jobs, holding that this is merely another management initiative to speed up workers and encourage them to work harder, with the sociologist's questionnaire replacing the stopwatch of time and motion study. The breaking up of traditional occupational divisions, especially where these have been the basis of membership of particular unions, raises difficult problems for union organisation and policy. Traditional instruments of union action and collective bargaining, involving control of transfers and promotions of workers from one job category to another, may be disturbed. If the changed work organisation is more efficient, labour's old fear of displacement of labour and unemployment may be revived. Finally, some unions fear that if workers become too satisfied with their jobs and too attached to the enterprise in which they work, their loyalties to the trade union may be weakened.

In several countries, however, unions have taken the lead in pressing for the improvement of working conditions, including the reduction of monotony and increased job satisfaction (1). In other countries where unions began with a neutral or even hostile attitude to "humanised" work organisation, these attitudes have evolved into a more positive approach, which aims at gaining something for the workers out of such changes.

Effects of "Humanised" Work Organisation

Unfortunately, little systematic, reliable information is available on the practical effects of the innovations that have been tried. Some companies have reported reductions in absenteeism and labour turnover, but others have found that temporary improvements of this sort have not been sustained. Effects on earnings and efficiency have hardly been documented at all. Some innovations provide increased opportunities for production workers to increase their vocational competence, but it is not clear that the skills acquired in this manner can always be transferred to other enterprises or what value they have on the employment market.

Generally speaking, production workers who have tried out new methods of work organisation do not wish to return to the earlier system. The change is thus regarded as an improvement by the workers concerned. Some workers, however, do not respond positively to the changes, or even reject opportunities to be involved in them. In some cases workers have found that they are busier after the changes than before, and experience greater mental stress. In other cases workers not only derive greater satisfaction from their work, but are less subject to minor psychosomatic ailments frequently associated with stress.

A particularly important factor in the effects of humanised work organisation upon efficiency and upon the satisfaction of the workers involved, is the expectations of the workers, and the extent to which they consider autonomy and participation in decisions to be legitimate for them. These factors probably account for the different results obtained by research on participatory supervision in different countries. Most of the studies showing positive effects of such participatory supervision upon efficiency and worker attitudes have been carried out in the United States of America, but studies in Britain, India and Norway report different results.

The effects of "humanised" work organisation upon the distribution of power within the enterprise are very complex, and have not been systematically studied. In general such innovations involve a transfer of power from supervisors and various executives to production workers, and supervisors and executives are required to replace close, authoritarian supervision of their subordinates by something nearer to a service function. Specialists, such as engineers and technicians in methods departments, find their approaches challenged and have to give up a unilateral approach to the problems with which they are concerned.

In general, the effects of "humanised" work organisation on co-operation and industrial relations appear to have been favourable. Instances have occurred, however, of the various problems mentioned above leading to overt industrial conflict. It seems likely that these have been avoided in other cases through the adoption of procedures which ensure that all the parties concerned have an opportunity to negotiate on all the issues involved, and that innovations do not preceed further if strong opposition is encountered.

Legislative Approaches to Practical Action

The scope for legislation upon improvement of working conditions and involvement of workers in the life of the enterprise appears to consist of:

(a) factory legislation on physical working conditions;

(b) legislation on enterprise organisation providing for structural participation; and

(c) other legislation setting up machinery for a more indirect attack on the problems.

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(1) See H. Günter: "Labour Oriented Approaches to the Humanisation of Work", International Institute for Labour Studies Bulletin No. 11, 1974, pp. 21-24.

(a) Even within the traditional field of factory law, experience in all countries shows that effective application of such legislation requires the commitment and co-operation of management, unions and workers themselves. The control of accidents, for example, has proved to be very largely a human and organisational problem for which the standards laid down in factory law can only provide the foundation and orientation. Safe working practice has to be approached positively as a problem of human organisation; the negative approach of the removal of hazards by placing guards on machines and controlling hazardous processes is not enough.

(b) Experience with structural participation, as reviewed above, shows that it is more likely to lead to active involvement of workers in the life of the enterprise when it corresponds to the felt needs and policies of management, unions and workers. However appropriate to the situation the legal provisions may be, they can only provide a framework which must be brought to life and made effective by the parties themselves. Structural participation forced upon managements, unions and workers against their will or in the absence of any real interest, is not likely to prove effective, unless accompanied by considerable efforts at education of all concerned.

(c) A third field for legislation is the setting up of agencies which can lead and help the parties to find solutions to the problems involved. To be effective, such agencies may need to have the backing of substantive legislation of a general character, which would set their objectives and give them the authoritative status necessary for their work to make a significant impact.

Such agencies should undertake appropriate research and investigations, as well as educational and training programmes of a character and a scale necessary to complement those already being undertaken in management and labour organisations. They should offer appropriately equipped advisory services to assist with developments and should monitor relevant experiments. The aim should be to build on existing machinery where appropriate. Thus, for example, much could be done through collective agreements and through giving works councils specific competence in relation to certain issues. The advisory services of the agencies would need to stimulate and support innovations to be introduced with the aid of existing machinery. They would also advise, as appropriate, on the institution of new machinery.

Such agencies would need to take a comprehensive view of the trends and developments in the whole field of working conditions and matters related to the involvement of workers in the life of the enterprise. It seems clear that, despite some disillusionment with various forms of structural participation, for example, most countries are determined to go further in this direction rather than to retreat. Growing recognition that the problem is more complex than was thought is a hopeful indicator of the possibility of adoption of a more discriminating approach than in the past. Such an approach might have more modest objectives but be more realistically adjusted to the total pattern of institutions and processes that influence the life of the enterprise.

Other Approaches

Short of legislation, reliance can be placed on programmes of education and research to be carried out by existing bodies, including universities. Even with legislation, there is much scope for such activities as a complement. A judicious mixture of both approaches, on an international basis, and involving appropriate co-ordination, is likely to prove the most effective.

The Role of "Industrial Democracy" in Practical Action to Improve Working Conditions

From what has been said it follows that programmes to improve working conditions must involve workers and their organisations at each strategic step. Otherwise, workers may not regard proposed changes in working conditions as true "improvements" from their point of view and the objective of the programme will not be achieved.

This implies that account must be taken of the institutions already existing in each country which provide for involvement of workers in decisions that affect them. Such institutions cannot be ignored; they must be brought into the decision-making process in order to give effect to the views of workers and their organisations.

Such institutions exist at various levels in different countries, and differ in their liveliness, as noted above. A practical programme needs to take the existing institutions into account and to give them a positive role. At the same time, the differences between countries make a uniform approach difficult and ineffective.

If an appropriate agency were created in each country, it could be given the task of preparing and discharging an action programme adjusted to the national situation, while adhering to broad principles. Such principles could include:

(1) a government level commitment (expressed in the legislation setting up the agency) to meaningful and satisfying work for the individual;

(2) a government commitment to giving full expression to the views of the social partners in devising means towards this end (perhaps through the constitution of the agency);

(3) arrangements for effective collaboration of the social partners in the formulation of the programme of the agency and for consultation with them by the agency in carrying out its programme;

(4) a direction to the agency to examine means of activating the existing institutions, including collective bargaining, in the service of the objective and to include such means in its programme.

This could include, for example, a recommendation by the agency for legislation requiring works councils, where they are established by legislation, to give attention to the "humanisation" of work organisation, etc. Pressure could also be brought on collective bargaining, as appropriate;

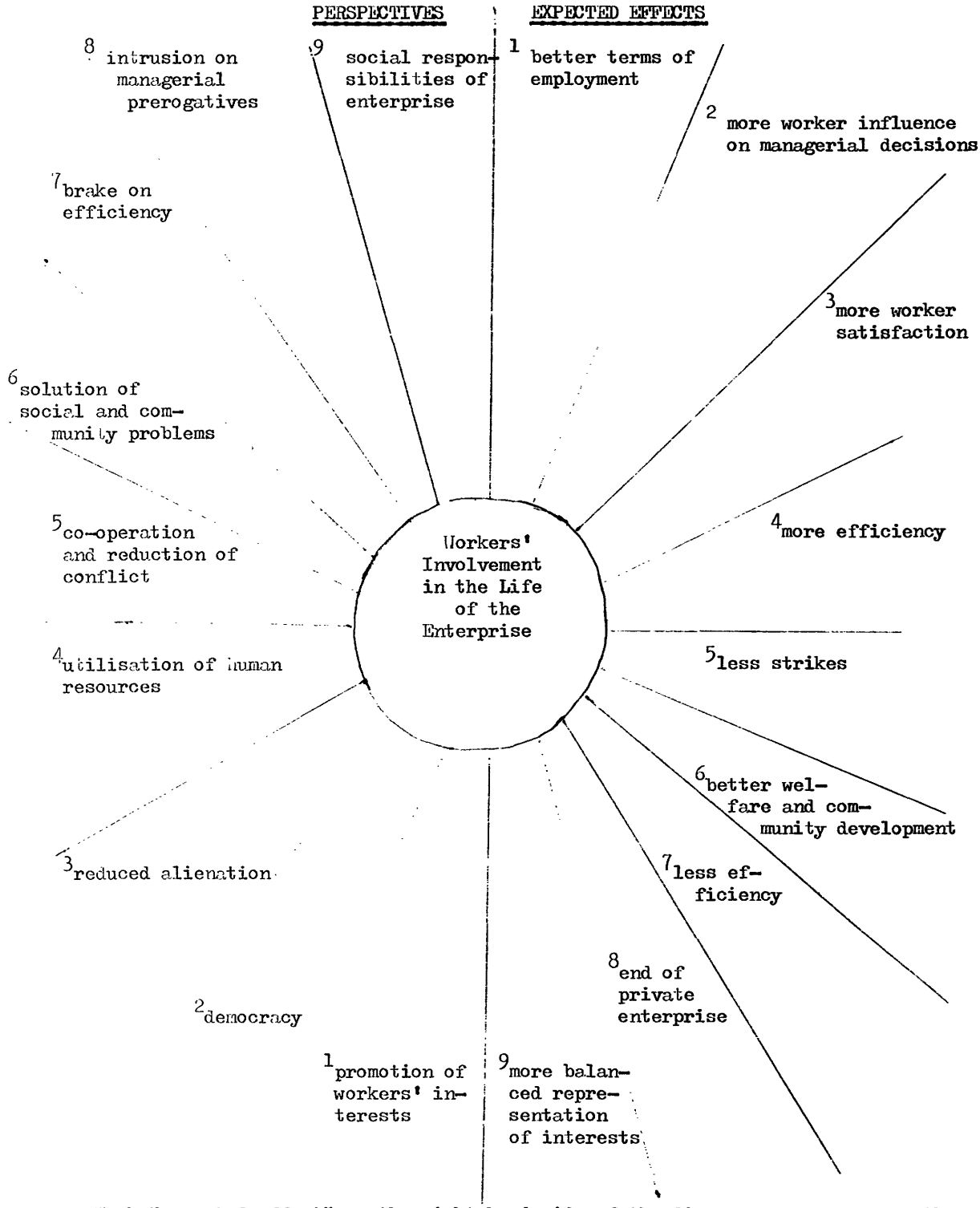
(5) requiring the agency to provide animating and advisory services, backed by research, to the existing institutions to help them fulfil their role in the programme (to avoid a mere formal observance of the policy);

(6) an educational programme on a scale large enough to make a significant impact on workers' capacity and willingness to share in decisions. The programme should, as far as possible, be carried out through workers' organisations;

(7) inclusion in the agency's programme of seminars to provide opportunities for the social partners to discuss problems and possible conflicts associated with changes in work organisation.

Figure 1

PERSPECTIVES AND EXPECTED EFFECTS OF WORKERS' INVOLVEMENT IN THE LIFE OF THE ENTERPRISE



Note - Each "expected effect" on the right hand side of the diagram corresponds to the particular perspective bearing the same number on the left hand side. Thus when viewed in Perspective 1, (promotion of workers' interests) workers involvement is expected to produce Effect 1, (better terms of employment). When viewed in Perspective 2, involvement is expected to produce Effect 2.

REPORT OF WORKING GROUP I

"VOCATIONAL LIFE IN EUROPEAN SOCIETY"

PRESENTED BY MR. F. LAGRANGE,

MAITRE DE REQUETES AT THE CONSEIL D'ETAT, PARIS

Our subject: vocational life in European society, a particularly wide and complex subject which included, according to the division established by the Commission, both the problem of working conditions and working relations and the more general problem of participation. Of course, I will only deal here with a few aspects of the discussions, referring to Mr. Walker's report and my written report, and selecting only those guidelines meeting the desires of the Commission, namely, the preparation of a social programme for the next few years for the Community. I shall divide this subject into two series of guidelines. First, the problems relating to the subject and second, an outline of firm recommendations. As regards the problems, our Working Party has outlined several guidelines as regards method and policy.

The first guideline, which at first glance seems to be obvious, is that national differences should be taken into greater consideration when social policies are drawn up. Procedures, legislation and customs cannot be transferred from one country to another. In fact, social policy can be compared with heart transplants: beware of reject reactions. Which in practice means that one law, drawn up by the Community and applied in the various countries will not in fact be the same law: the meaning and effects will be extremely different. An example which held the working Party's attention in this respect is of course that of co-management. The members of the working party pointed out that the form of co-management applied in Germany, France, Italy or the United Kingdom would have basically different effects. Consequently, the participants hope that Community action will base on flexible lines rather than on harmonisation or unification.

Of course, the most important factor to be taken into consideration in the social and political context is the trade unions, and in this respect many of our colleagues regretted without, however, reproaching the Commission, the fact that there were very few trade unionists present, to say the least. These discussions on the need to take into account facts in the national context clearly showed that attitudes differ considerably between two types of countries: countries where there is fairly general agreement between both sides of industry on the economic and social system and the acceptance of market economy, e.g., in Scandinavia, United States or Germany; countries where, on the contrary, there is considerable controversy on the actual type of society and economic and social system, e.g. France, Italy and, to a lesser extent perhaps, Belgium or the United Kingdom.

Second guideline: basic problems must be given priority. The problems of working conditions, industrial relations and those raised at the level of each worker and labourer in his workshop, or each employee in his office. Consequently, the reforms which will be given priority will be those affecting the worker and employee in his working day. Which means that the representative institutions will have to be fundamentally changed, as will the running of the workshops; some people, and I mean some and not all, wonder whether the basic reform to be envisaged for the coming years should not consist in examining the methods and procedures for gradually acknowledging and establishing the worker's right to have a say in respect of his working conditions. Doubtless every country possesses institutions representing personnel in this respect, staff delegates, trade union delegates, undertaking or business committees. But should we not go further to provide workers with the possibility of expressing themselves more fully, more directly and authentically on their own working conditions? Heads of undertakings themselves acknowledge that here is a capacity for proposal and creation in personnel which should be developed.

The third guideline, either positive or negative depending on your point of view, is the considerable caution shown by our working party in these discussions in regard to joint management considered as participation on a company scale, in boards of administration and supervisory committees. Our German colleagues have doubtless pointed out the desirability of joint management and its positive aspects: considerable transparency in training on the job, better understanding between both sides of industry and recognition that the undertaking is essentially as much the work of the workers as of the shareholders. On the other hand, however our other colleagues have pointed out that in a number of countries, the trade unions are not particularly in favour of joint management, one cannot be both worker and employer. Joint management is liable to distort the negotiation machinery in the undertaking. Moreover, others add that joint management consists in participation at the top, restricted to a small elite - a very small number of trade unionists or workers' representatives - with hardly any effect on the undertaking as a whole.

Fourth guideline: if participation is to be effected by a number of ways and means, the best and normal method is that of collective negotiation, collective agreement or convention. It is the most flexible and best corresponds with the conflictual nature of relations within the undertaking, since we should not forget that workers' interests do not necessarily coincide with those of the undertaking, since conflict is inherent in the nature and constitution of

the undertaking. The Working Party feels that the contractual method is all the more necessary as it is extremely difficult to legislate on working conditions and industrial relations, the problems being very real and specific to each undertaking.

Lastly, the fifth guideline: if all the members of the Working Party recognize the growing need for participation in our society, we must choose the right level of participation if we are to succeed.

That this need exists is clearly indicated by the level of education received by the new generations. A very high fraction of an age group benefits from extended education. In this respect, I should like to quote a figure relating to France: in the 1920's, only 3 % of a single age group continued their education up to the age of 18-19. Today, this figure is nearly 25 %. The correct levels of participation must be found since we must remember that in our society, a person is to some extent divided and torn between the requirements of the complex institutions of our society. He is requested to join his trade union and to take part in his children's educational institutions, he has to live his family life, go to church, participate in municipal affairs - in short, he is subject to all kinds of requests which do not include his leisure time. If participation is not to be a myth or limited to a few, the levels must be formed at which the individual is most concerned.

Sixth guideline: another consideration, which accords fairly well with the preceding guidelines, is that we should not neglect, in any employment policy, the traditional aspects of occupational hygiene, safety and disease. There is an overabundance of literature on job enrichment, job enlargement and participation, but we must not forget that, despite technological progress, there is no guarantee that, in all our plants and industries, a worker's health is respected and his work in many cases is not prejudicial to his fundamental biological equilibrium. In this respect, one of the members of the Working Party pointed out that the rate and amount of work frequently decided by offices totally unconnected with the workers is designed for the normal worker. Normality constitutes about 10 or 15 % of the population.

I now come, and I shall try to be brief, to firm recommendations or certain outlines of concrete recommendations for a Community policy. My first suggestion, if I may call it such: the Working Party thought it would be a very useful and positive step to set up a European Foundation for the improvement of working conditions. It could take the form of an experience bank, a means of placing research workers in various countries into contact with one another, a documentation centre and, more generally, an effective instrument for encouraging research and disseminating the results. Insofar as the working conditions policy must be very pragmatic, barely legislative, it would be useful to have a very flexible research body which could, at the very most, in addition to research, gradually propose a type of code of good conduct in employment to the Commission and Community institutions.

The second suggestion is that perhaps we should use existing institutions such as the European Social Fund or the European Investment Bank to start with financial aid, certain pilot experiments on basic working conditions or industrial relations, on the understanding that this would be done with the agreement of the public authorities of the State in question and both sides of the industry forming the subject of such an experiment.

The third suggestion is that the training programmes should be revised to include the problems of working conditions and industrial relations. It is not right that our major engineering schools do not allocate much time to the real problems of employment, their concepts are too abstract and people are judged on intellectual merits only.

The last suggestion was not unanimously agreed on by the Working Party; it received sufficient approval, however, to be mentioned here. The idea is to gradually oblige, possibly at Community level, the undertakings to prepare a social report on action taken in the field of working conditions in the past year, and a programme for the next few years. The report, varying from country to country, would be submitted to the institutions representing personnel. It could comprise data to be defined, varying where appropriate, according to the vocational branches. Information would cover the number of accidents at work, turnover, absenteeism, worker-training expenditure, expenditure on improving the work environment, an annual or multiannual programme could also take the same form. Information could be given on estimated expenditure on various items in the undertaking. Of course, this plan would have to be submitted to the staff representation institutions which again vary according to the country. The content of the information would vary depending on the vocational branch while, initially, we would perhaps observe caution and include only a small amount of data, gradually stepping-up to obtain valid information such as noise, temperature and pollution charts.

The programme need not be binding on the undertakings, or it could be binding for one year only, then serve as a guideline. This concept which, in fact, is not revolutionary since some undertakings have already put it into practice, would be aimed at undertaking a more systematic study of working conditions and especially at integrating these problems at the heart of the undertaking. There is no reason why our undertakings with investment programmes which of course are adjusted to the current economic situation, should not take provisional measures on working conditions.

I should like, if I may, to conclude with one or two comments. The first is that we must have Community action in the social field of working conditions and participation. There can be no Europe without a social policy, unless it is also a worker's Europe. Of course, social policy is still basically national and Europe can only take direct action with difficulty. Nevertheless, it is extremely effective, bearing in mind the awareness and encouragement it gives the States. It can indeed help to unblock national situations, since it is a fact that in most of the countries, there is often very severe opposition conflict between the employers' organisations and the trade unions. Clearly no progress can be achieved without the opportunity to transcend and overcome the radical employer-trade-union conflict. This is where Europe can help.

Europe could also form the framework in which to discuss the limits of the economic market. All our countries believe, rightly, I feel, that an economic market is indisputably better than any other form of economy, but it is clear that this system which, with economic efficacy, must not be jeopardised, has certain drawbacks. We must overcome excessive competition. So, to conclude, I would say that Europe's real task is to establish society's true finalities, likely to produce a society capable of mastering the economic process and not of being ruled by it.

We can of course wonder whether we are not about to enter a period of great economic difficulty, where, with full employment being difficult to obtain, working conditions will really become a pressing problem. For my part, I think that whatever the economic vicissitudes, we shall have to remedy the basic contradiction of our society, an industrial society, which constantly increases the level of education but which continues to offer purely repetitive jobs which restrict the individual. It is unacceptable in a democratic society that there is a small number of people with the opportunity to create and develop and a large number who are merely cogs on an automated wheel. Man's universe is not of course restricted to work, which our working group has not failed to note, yet it remains that work is one of man's distinctive characteristics in our society.

REPORT OF THE SPECIALIST SEMINAR

"LIGHT AND HEAVY ENGINEERING AND PROCESS INDUSTRY"

PRESENTED BY DR. W.J. PAUL, DIRECTOR OF NORTH-PAUL & ASS. LTD, LONDON

This report is intended to describe in summary the discussions of a group of invited specialists in those fields of activity which are concerned with the improvement of work and the quality of working life. Experts were invited from each of the member countries of the community and those who attended (See Appendix 1) did, to a large extent, represent the diversity of economic and cultural conditions which prevail within the community. In addition their personal backgrounds and experience permitted them to reflect the views of management, trade unions, government and the university. They had been asked to attend with a view to pooling their various experiences in order to determine whether or not there were any common denominators in the process of implementing these types of change, the problems and difficulties encountered, the changes themselves and the results which followed. They were also asked to consider ways in which the Commission could act to facilitate and promote this type of activity.

Much of the group's early discussion suggested that the reasons for initiating this type of change were essentially reactive in the sense that the activities undertaken were almost invariably designed to alleviate an existing and specific problem or to prevent the occurrence of a specific problem. The specific problems, varied substantially and could almost be said to be unique in each case. There were, however, certain common elements in those situations which provoked changes of this type. The experts felt that the conditions which most frequently permitted the alternation of social systems or the attempt to "humanise" work processes more were essentially economic in their definition or implication. These could vary from increasing difficulty in recruiting and retaining labor through maintaining or increasing product quality to holding or improving on existing production levels. Whatever the particular reason involved may have been there did seem to be a necessity to justify the activity in economic terms.

What is perhaps critical to point out is that in so far as these types of activity were seen as relevant to the resolution of economic problems there is at least the implicit suggestion that to an increasing extent it is recognized that the social and psychological dimensions of organizations and work processes are important determinants of their effectiveness and consequently need to be better understood and more effectively managed. It was also suggested that the consideration of these dimensions becomes significantly more imperative as the level of education and affluence rises. In some of the countries represented these concerns had achieved sufficient social import to be reflected in political initiatives and trades union demands and policy which in turn generated further impetus for changes in these areas. Even in those countries where the improvement of the quality of working life and the increased democratization of industry hadn't achieved this type of institutional stature it was at least sufficiently important as an issue to cause many organizations who had and wanted to maintain an image as "progressive" to become involved in making changes within their own organizations of this type.

It was the view of the experts that most of the attempts to improve work processes or the quality of working life were largely isolated and essentially pragmatic reactions to specific conditions or situations and did not, at least yet, represent any broadly based shift in social climate or structure. To the extent that this was true they also accepted that progress in this field was in the short term vulnerable to any changes in local economic or political conditions. The general instability in both of these areas in many countries arouses a certain amount of anxiety about their ability to sustain and build on current levels of activity.

When the experts were invited to discuss the types of change which could be regarded as characteristic of programmes designed to improve the quality of working life they found it extremely difficult to be concrete and were generally reluctant to generalize particular changes beyond the situation in which they had been adopted. It was generally agreed that there could be no formulistic answer and that it was unlikely that there ever would be. The nature of a social system within a work place, organizational infrastructures, technology, industrial relations, ethnicity, company history, affluence and individual personalities vary to such an enormous extent that no two work places are ever alike. Within the Community this is compounded by at least equal variance in the cultures in which work places are located and makes it virtually axiomatic that no two programmes designed to improve the quality of working life can be exactly alike or even have the same outcomes in any very specific terms. At best one can set out to create the conditions under which individuals and groups of people can find an answer which is appropriate at that point in time and which permits a continuing and evolutionary process of change as their needs and expectations change.

Reports provided by the experts, however, suggested that these conditions would have to such

that change in some combination of the following would have to be permitted and encouraged if the programme were to be successful:

- increased discretion and responsibility of individuals or groups for those decisions which directly affect their activity or its outcomes

- substantially increased feedback on individual or group performance with particular emphasis on providing positive feedback for good performance instead of the more typical concentration on mistakes and shortcomings

- the creation of work organizations and job design which foster individual interdependence and cooperation

- increasing the skills and responsibilities of those in supervis positions for the man management elements of their jobs and greater accountability for the effectiveness with which they discharge their responsibilities

- further democratize labour management relations at many levels ranging from improved consultative machinery with work teams to the more formal means for providing worker representation at board level

- attempts to increase the organization's responsiveness to changing conditions both internally and externally

- efforts to make work more intrinsically interesting and complete with an emphasis on providing individuals with an opportunity to develop and use their capacities

- attempts insure that the benefit of any increases in productivity are equitably shared and not gained at excessive human cost.

Some permutation of these principles and characteristics seems to have been typical of most of the reported attempts to improve the quality of working life in the engineering and process industries. It is interesting to note that though the means for giving expression to these principles and characteristics may be influenced by these industries, technology structure and traditions, the principles and characteristics are typical of quality of working life programmes anywhere.

There was remarkable agreement among the participants about those things which inhibit or make difficult the implementation of changes in this area. The most frequently mentioned barrier to change was the reluctance of senior management to sanction change in this area and the resistance of middle management who felt that these activities posed some threat to their own security and status. Current wage systems and particularly piece work systems, traditional budgetary and control systems, old methods of plant lay out and design and traditional production engineering methods were perhaps the next most frequently mentioned category of barriers or obstacle to change. There was also some suggestion that a tendency for trade unionists to prematurely convert the issues into a simplistic monetary debate and substantial latent suspicion on their own part and on their members parts interfered with progress. Finally an absence of very much experience or data in the field made it more difficult to reassure all of those concerned and made early mistakes likely.

When asked in what ways they felt the Commission could be of help in facilitating and encouraging activity in this field the group were nearly unanimous in their opinion that this was a field in which it was inappropriate to legislate and at this stage potentially counter productive. They did, however, suggest numerous ways in which help by the Commission would be extremely helpful:

- The encouragement and funding of community pilot projects

- The creation of a central repository for information on current and past activity which would be cross indexed and easily accessible

- Encourage and provide facilities for worker and management visits to those places where activity is currently in progress

- To provide resources and expertise for developing techniques for introducing and assessing change

- To discourage wage systems which were incompatible with these concepts

- Help in providing some definition of those cultural values which need to be taken into account.

The participants were agreed that the interest of the Commission and the Social Partners by itself gave credence and visibility to their activities and expressed the hope that this would continue and increase.

REPORT OF SPECIALIST SEMINAR

"WHITE COLLAR WORK"

PRESENTED BY MISS L. KLEIN,

TAVISTOCK INSTITUTE, LONDON

1. WHAT IS WHITE COLLAR WORK ?

It became clear in the discussions that, the more one goes into the details and minutiae of actual tasks, the more difficult it becomes to distinguish between the characteristics of some white collar and some blue collar tasks. For instance, the work of the process operator in chemical industry is very like that in many "white collar" jobs. On the other hand, viewed from a little greater distance, some important differences both in occupational structures and in occupational traditions become visible and make it relevant to discuss white collar work as an entity. The personal dynamics and needs of the people are the same, the differences lie in the history and circumstances of their work.

Three types of white collar work can be distinguished:

1) Public administration;

2) The tertiary sector - organisations such as insurance and banking;

3) The administrative parts of manufacturing organisations.

Some distinguishing characteristics are:

- Within white collar work, more groups have more of the "reflective" aspects of tasks and less of the "reflex" aspects of tasks. White collar work, after all, includes the work of the managing director.

- Many people, both in the service industries and in public administration, have contact with clients or customers, which is generally absent in blue collar work. Therefore, when one tries to tackle the experience of bureaucracy, the customer's experience is also relevant. In Belgium, the Ministry of Finance is providing human relations training for tax officials.

- In the public sector staff are often executing political and legal decisions and not management decisions, and this affects what scope there is for change. The boss is the state, and the position of the staff is frequently regulated by statute.

- In some countries this special position of the public servant is accompanied by a special sense of high status. There have, at any rate in the past, been important social advantages such as insurance and retirement schemes and it was pointed out that even today the French legislature does not count the salary of a public servant as a reward for his work but more as a means to sustain a special social role.

- On the whole, physical working conditions have been easier in white collar work.

- Perhaps partly for this reason there has been far less collective action and unionization. White collar workers tend to seek individual solutions to their problems rather than collective solutions. Bad psychological working conditions such as stress and monotony have not received the same trade union attention as bad physical working conditions.

- The world of the white collar worker is said to be a more emotionally vulnerable world than that of the blue collar worker. The white collar worker is weaker. People have fears and anxieties about impending changes and are thought to be subjected to the psychological tyranny of status at least as much as their colleagues are subject to the tyranny of technology. Definitions of job grades become the focus for trade union agreements.

- There are, on the whole, far more women in white collar than in blue collar work.

- The rationalisation of work, or "Taylorism" reached white collar work later than blue collar work. Employers in the white collar field are discovering the advantages of Taylorism at a time when employers in the blue collar field are recognising its disadvantages.

2. THE COMPUTER

Some of the distinctions which have been mentioned are growing smaller, but the single major development which has blurred the distinctions between white and blue collar work is the advent of the computer. It has led to far greater fragmentation of jobs and many other

features traditionally associated with factory life: -

(a) Computerisation brings all the well-known problems of technical change - redundancy, lack of consultation when changes are made, lack of sensitivity to the demands that are made on people's adaptability.

(b) Traditionally there have been considerable opportunities for promotion for white collar workers. Many senior managers in banks began as junior clerks. Where the tasks created by computers are of a very simple and low level kind, it becomes less likely that people will be able later to work at a higher level. In organisations which are accustomed to promoting from inside the impact of this is very great.

(c) Many people find themselves in the role of servant rather than user of the computer, i.e. inputting data to the system. In that situation may be found all the problems of assembly line work - poor job satisfaction, repetitiveness, lack of autonomy etc..., though perhaps with cleaner working conditions.

People in the user role, i.e. who are getting a service from the computer, have an entirely different view. They respond to it as if to a tool which is helping them with their job, though they may be frustrated if the tool limits them, for instance, gets between them and a customer. In real time systems the technology may be so much in control that it may be hard for even senior people to avoid feeling they are being ruled by the computer terminal; they may need special training to manage the interaction. Computer systems need to be designed so that they support the people who are using them. Systems designers are frequently more concerned about how to get the data into the system than about what the system is being used for.

Research has shown that the relationship between computer technology and work structure is weak. Computer technology is very flexible; "Taylorised" and routinised work is being created, not because of the technology, but because of the values and assumptions of the systems designers. They tend to perceive the user population as very institutionalised, not very intelligent, very resistant to change so that systems have to have tight controls and simple inputs and outputs. Users, on the other hand, have a completely different self-image, asking for interest, challenge and scope for decision making. Thus designers and users have quite different models of man. Users, in turn, develop stereotypes about designers.

Industrial engineers in manufacturing situations had the same problems, but earlier. They have had more feedback, and have not been able to get away with inappropriate models of man, because the working population on the shop floor manipulates their systems, reacts strongly, and teaches them.

All this leads to very important questions about whose responsibility it is to design the organisations of the future. Is it a question of ensuring more multidisciplinary training for systems designers, which includes human and social criteria and a knowledge of job and organisation design? Or is it a question of management not leaving such important responsibilities to systems designers but facing its own assumptions and values and taking responsibility for them? Or is it a question of creating space so that people can design their own situations?

3. STRATEGIES FOR CHANGE

There was considerable discussion on strategies and initiatives for change:

- Legal initiatives

In Sweden it is changes in the legal rights of employers to determine work organisation which will be, if they are achieved, the most important impetus to change. There was a request from some of the membership for directives from the Commission since it was said that public administration, at any rate, will not change unless directed.

- Management initiatives

In one organisation most of the Board of Directors have had T-group training, and this was said to have influenced them in the direction of openness to change. In another organisation the top levels have been reorganised but people have been given a year or more to prepare for their new posts before taking them up, by training, exchange experiences,

personal counselling, etc... It was felt that people actually filling posts do not have the spare time and energy for basic re-thinking.

- Trade Union initiatives

In Norway a lot of stimulus is coming from the trade unions. One union is in effect training its own members to become systems designers, and preparing its own textbooks.

- Training

The early, basic training for staff should be broad, preparing them for a range of tasks, rather than narrow.

- Administration

One public service authority has recognised the need to consider how laws are administered and has set up a body, with full trade union participation, to occupy itself with the problem. The emphasis is on informal dialogue to explore problems rather than rigid structures.

- Opportunism

The opportunities in different situations are quite different, and should be used as they arise. Technical changes, the expressed views of workers, consumer movements, market changes, may create possibilities for re-considering the nature of work.

- Involve middle management

A case was cited where a project failed because people in the middle of the organisation had not been consulted.

4. SOME PROBLEMS OF STRATEGY

(a) How open-ended? One member felt that change strategies should be carefully planned, with nothing left to change; others that flexibility and openness were important.

(b) How useful are demonstration experiments? There were differences of opinion on this. Some members felt that pilot experiments are essential, others are becoming concerned that pilot experiments remain "experiments" and become encapsulated, providing more of a threat or challenge to others in the organisation or country than an example.

(c) How interdependent? There are many kinds of interdependence which need to be considered. One concerns the relationship between work design and other aspects of the quality of working life, indeed of the quality of life in the wider sense - work and leisure, family, etc... Another kind of interdependence exists between the design of work and other aspects of organisation developments. Is it possible to look at task design without getting involved in administrative processes, accounting and control systems, and even the processes by which these are arrived at? At the macro level there is interdependence between organisations: one cannot modify what happens in schools without getting involved in teacher training institutions, and vice versa. These natural interdependencies should be explored so as to obtain a more organic development.

5. SOME ASPECTS OF THE TRADE UNION ROLE

There were several trade union representatives in the seminars, and some discussion of their role in the new developments. One difficulty is that the role, and even recognition of trade unions has developed very unevenly, and in some situations even simple consultation still leaves much to be desired. Where trade unions are still not "consulted" until after major technical and administrative decisions are taken, and then only in a superficial way, their attention is more likely to be on these problems than on job design.

Where the role of the trade unions is more assured, they may be inhibited by a "knowledge gap" in the field of job design, since more of their experience has been in the field of conditions of employment than conditions of actual work. It has to be acknowledged that many job design activities have a labour saving potential, and this is very worrying for unions. There may sometimes, too, be differences of interest and difficulties of communication

between trade union officials and their members. Needless to say, there were differences of opinion within the seminar about whether this is so - in any case, there was agreement that if funds are to become available for training and exchange experiences in the new developments in work organisation, trade unionists and their members should have prior claims on such funds. There is great diversity in union attitudes, and the Commission should perhaps facilitate contracts between unions.

6. THE COMMISSION

It was not very clear what the Commission can in fact do, and therefore what members of the seminar could ask it to do. Some suggestions were:

- In the field of public administration, there should be some emphasis on directives and harmonisation. For instance, sorting equipment in the postal services is now standardised throughout Europe, but the working conditions of people operating the equipment are not.

- It is very doubtful whether the Commission should undertake pilot experiments, a) because doing a few experiments gives administration the illusion that they have met their responsibilities, and b) pilot experiments may not be the best method in any case.

- The Commission should concern itself with diffusion, with the spread of knowledge and exchange of experience. "If they want to do pilot projects, they should do them in the Commission".

- The Commission should state its values clearly. Public statements from the Commission are valuable.

- If money is spent on development and training programmes, these should be agreed with trade unions beforehand. The way the Commission itself works will convey its values.

- If there is to be further exchange of experiences, this should focus on concrete cases, and systems designers should be included.

WORKING PAPER FOR GROUP II

METHODS AND ACHIEVEMENTS: "WHITE COLLAR WORK, LIGHT AND HEAVY ENGINEERING"

PRESENTED BY MISS L. KLEIN,
TAVISTOCK INSTITUTE, LONDON

I. THE IMPORTANCE OF WORK ORGANISATION

Issues of human welfare can be ranged along a continuum: from those most internal to the individual, concerned with his most personal needs and development in life, to those which are external to him, and concerned with political and social organisation in the world around him. The way in which work is organised has relevance at many points of the continuum.

At the level of the individual person, work is a main means of achieving economic viability and adult status in the Western world, of expressing and developing the personality, and of relating to society. At an intermediate level the way in which people spend their working lives, that is most of their waking lives, helps to shape their perceptions and attitudes and therefore in turn has cultural and social consequences. At the level of the wider society, the forms taken by the division of labour have led to structural and class alignments, to the creation of political "worker" or "labour" parties in a number of European countries, and to the development of trade union movements with varying degrees of political as well as economic power. In the future, it is likely to become the subject of international politics as well, firstly because of the development of multinational employers, and secondly because, in a variety of ways, the more prosperous nations are exporting some of their tasks to the less prosperous nations.

At any one of these levels enough is known now to tackle the problems if not entirely to solve them. Some of the most important questions, therefore, now arise from the difficulty of relating the different levels to each other, since solutions at one level can conflict with solutions at another.

a) Consequences for Individuals

To begin, then with the individual. Psychoanalysts do not all take the same view about whether the importance of work in human life has direct biological origins or derived cultural ones. Some attribute it to a primary biological drive to master the environment; others to a more socio-cultural force, the pleasure which is gained from achievement. Whatever the basic origins of the importance of work, Freud saw its function as providing one of man's main links with reality: "Laying a stress upon importance of work has a greater effect than any other technique of living in the direction of binding the individual more closely to reality; in his work he is at least securely attached to a part of reality, the human community. Work is no less valuable for the opportunity it and the human relations connected with it provide for a very considerable charge of libidinal component impulses, ... than because it is indispensable for subsistence and justifies existence in a society. The daily work of earning a livelihood affords particular satisfaction when it has been selected by free choice i.e. when through sublimation it enables use to be made of the existing inclinations, of instinctual impulses that have retained their strength, or are more intense than usual for constitutional reasons."(1)

This view is substantiated by studies of the unemployed and by the problems experienced by people after retirement. The nature of the link with reality is discussed by Jahoda(2), who suggests a number of dimensions: first, work strengthens the experience of the passing of time, people without work tending to lose a sense of time; second, work "encourages the continuous action necessary to maintain objective knowledge of reality" since the ordinary man needs to experience the consequences of his actions and to put his subjective knowledge of reality continuously to the test; third, work permits the pleasurable experience of competence; fourth, work adds to the individual's store of conventional knowledge, particulary to his knowledge of inter-dependence with others in common purposes; fifth, work permits the enrichment of the world of immediate experience, and it permits the mutual reinforcement of pleasure and reality principles as regulators of adult behaviour.

Among the scenarios for the future which are currently discussed, is one which predicts the disappearance of work. Apart from the fact that this seems unrealistic, it also raises the prospect of immense personal and therefore social difficulties. The transition to an absence of work would at the very least be extremely difficult to make and produce many casualties. It would seem the better path, if scarcity is no longer the dominant driving force and there is spare capacity to devote this capacity to modifying work so that it in fact has more of the characteristics which are helpful to men in their development.

Among social as distinct from clinical researchers, there is now a very large body of research about work satisfaction, among various kinds of working populations, and generally as expressed in such things as turnover or absence rates, or in responses to interviews or

questionnaires. One recent contribution by Frederick Herzberg(3) makes the distinction between extrinsic or "hygiene" factors in the work situation, and intrinsic or "motivating" factors.

When people talked of times when they were dissatisfied with their work situation the reasons concerned company policy and administration, supervision (technical), salary, interpersonal relations - (supervisory), and working conditions.

On the other hand, when people talked of times when they had been happy, the reasons fell into different groups. These were achievement, recognition for achievement, the work itself, and responsibility.

The important thing about these findings is that the two lists are different. They do not represent opposite ends of the same scale, but different scales. The things that lead to positive satisfaction are different in kind from the things that cause dissatisfaction, not merely in the way the people feel about them.

However, social researchers also have their disagreements. There is a good deal of consensus about what characteristics of jobs people like or dislike, but some disagreement about whether all populations exhibit these needs to the same degree, given that their experiences outside the work situation vary; in other words, how far it is possible to generalise about human needs in work. One group of researchers has found differences between sub-cultures, specifically between workers in rural or town surroundings and those in urban or city surroundings.(4) This has been interpreted(5) as showing a closeness to traditional middle class values regarding work and achievement in the small town factories in the sample, and an alienation from such values in the urban setting. Another group of researchers claims that while the workers in their study had very similar views about the characteristics of their work as have been found elsewhere (particularly disliking monotony, pace, lack of autonomy and lack of opportunity to use skill) the fact that they actually remained in these jobs showed that they brought an economic, instrumental orientation to the work and that its intrinsic characteristics were not very important to them.(6)

Clearly the part which is played in all this by adaptation on the one hand and by perception - which may be a form of adaptation - on the other has not yet been adequately charted. Clearly, too, differences in research findings are to some extent a function of differences in research methods.

Sometimes the complexity and dynamics of a situation are better illustrated by a single case than by a number of surveys: A maintenance mechanic in a chemical process firm was being interviewed. It was an unstructured interview, during which no specific questions were asked, and for about two hours he talked freely about his job. At first he took a fairly instrumental line: "All I'm interested in is the money. This firm pays well, and that's the only reason I stop here. What a working man wants from his job is the pay packet, and don't let anybody kid you about other fancy notions".

Half an hour later he was talking about the firm, and discussed various things which he thought were wrong with it. The interviewer said nothing, but the mechanic seemed to think that he was being inconsistent, because he stopped himself. Then he said, "Well, you see, when you get a bit older, and the kids are off your hands, and you've paid for the house, and your wife's got a washing machine - you don't need money so much any more and you find you start noticing the firm. And by God it can annoy you!"

Half an hour after that he said, "You know - what I really like is when the machine goes wrong and I'm the one who knows how to put it right."

It would be foolish to argue about which of these was his "real" attitude. They were all real. Like the skins of an onion, most people have most of these attitudes, and the question is which of them gets tapped. It explains too why such conflicting evidence is thrown up by a good deal of research: the view one would take of this man's attitude would depend on when the interview was closed.

b) Consequences for culture

The current intense interest in job design has focussed very much on the effect of present forms of work organisation on the need satisfactions of individuals. It is important to point out that effects can also be seen at other levels.

Research in batch production of light engineering products(7) demonstrates a big gulf between the working experience of shopfloor operators and that of other people in the firm, a gulf which was induced by the organisation of the work and which led to differences in perception, attitudes and behaviour.

The firm was typical of the light engineering industry. The work was rationalised and sub-divided so that in the machine shops there were groups of milling machines, drilling machines, capstan lathes etc., each of them performing one operation on a wide variety of components. This form of work organisation was long established and the operators did not question or resent it.

On the other hand there were strong indications that the way in which the work was organised had influenced them considerably. It influenced first of all their perception, especially their perception of "the job". "The job" meant the immediate job cycle. When they talked about good jobs as distinct from bad jobs they meant "jobs" which had a loose price, "jobs" on which tools did not break easily or need sharpening too often, "jobs" on which production runs were long so that one could get into the swing of the "job" and make bonus, "jobs" which had been well inspected after the previous operation.

This narrow definition of the job was reinforced by the piecework system. If a man was paid every time he made a half-inch cut the implication was that this was what the firm considered his job be - not making a good product or being in any way concerned with the wider objectives of the firm.

The form of work organisation therefore also influenced attitudes. The operators on the whole regarded the firm as a good employer, but they were not very interested in it and did not feel personally involved in its affairs. The market conditions within which the firm was operating and its economic and technical policies only affected them if they interfered - as they sometimes did - with the smooth running of the piecework system. It is a necessary condition of piecework that there must be enough work available, that tools must be in good supply and well maintained, and that the planning of production must be smooth and efficient. Otherwise piecework is felt to be unfair. Thus it became important, and there was considerable pressure, for management to keep the operators sheltered from the problems of the firm, which were in fact considerable. The firm was engaged in small batch production in a difficult market and had acute problems of how to deal with urgent orders, control production, decide optimum batch sizes, keep down stocks and decide stock levels, and adapt to market fluctuations.

The piecework system also postulated certain personality characteristics on the part of operators and many in fact made the appropriate response. Although not everyone had made the appropriate adaptation, it was possible to describe and identify the "ideal pieceworker", the man who most successfully and with least stress to himself fitted into the system:-

He had good physical health, since the pace of work was high and obviously the faster he worked the more he stood to gain.

He was strongly motivated in the direction of money but not too much so. If his need for money was too urgent he might produce and record too much work and draw management's attention to loose prices.

He was independent, the kind of person who did not want a close relationship with his superiors or a close involvement with his firm.

He was confident vis-a-vis superiors, having the courage to challenge prices and to hold his own in the battle with time study.

He was not too troubled about the quality of the product or the care of the tools. He was paid, after all, for output. If tools broke or faulty pieces got through to inspection the payment system told him that this was not his concern.

Now one way of describing a culture is to describe the kind of individual who fits into it most successfully, and this leads to the main finding of this set of researches: In the short term the reorganisation of work and of payment systems can cause problems of adaptation and adjustment. In the long term they had the effect of creating a particular culture. For the operators in this firm the environment was consistent, requiring certain personality characteristics and tending to influence their perceptions and attitudes in certain directions. For

everyone else, whose work was not yet highly rationalised, the demands of the environment were much more varied and conflicting, their perception was wider and their attitudes were less homogeneous. The situation therefore also had the secondary effect of dividing the firm very clearly into two, the operators and the rest.

Work Organisation in Context

The present state of knowledge about work satisfaction and job design suggests three observations:

1. In a general sense, knowledge about the subject is incomplete, especially if the model of knowledge that is being used is that of engineering science. Human motivation will continue to provide material for doctoral theses for a long time. Attempts to draw up simple mechanical guidelines on how to deal with it, in themselves deny the dynamic nature of the subject. In the absence of "definitive" and "complete" knowledge therefore, ideas about psychological health are to some extent value laden and will remain so, and choices have to be made. However, a good deal of understanding and experience exists about the consequences of such choices.

2. In any specific situation one must take steps to explore the history, tradition, needs and values of the people in the situation. The theoretician is left with a number of unknowns about human needs. The practitioner in a particular situation need not be - he has the means of finding out.

3. Job design needs to be placed in its organisational context. Account needs to be taken of the relationships between the task an organisation sets itself, the means it selects to carry out that task, and the human and social situations that result. A number of studies in the last fifteen years have suggested that there are some patterns and regularities in such relationships, that circumstances can be described in which some kinds of organisation are more effective than others, and that degrees of freedom to choose can be made explicit. Research has shown links between the forms and problems to be found in an organisation, sometimes even the characteristics of its industrial relations, and such structural factors as the kind of market in which a firm operates (8) (9)*(10), the technology it uses (11), the control systems it instals (12), and its size (13).

Again, the knowledge produced by such studies is not "definitive" or "conclusive". There is need for a great deal more research based on detailed observation of what happens in real, not hypothetical, organisations. What this field of study has produced already, however, is guidelines for diagnosis. When a situation is examined with these relationships in mind and from the point of view of the interaction between structure and behaviour, there frequently emerges a new understanding of the situation which can serve as a basis for future action. Stresses and incompatibilities may become apparent which permit restructuring the situation or, if restructuring is not possible or acceptable, which at least make it clear why certain problems continue to recur.

The main problems which are uncovered in this way may not in the first instance or even at all be those connected with tasks at the lowest level of the enterprise. But the systematic relationship between situations at different levels will become explicit and strategies for change and development can be selected on a basis of knowledge.

If I have so far approached the question of redesigning the work at the lowest level of the enterprise with some caution, and in the context of other kinds of organisational diagnosis, it is because the case is too important to risk damaging it by oversimplifying or overstating it. Many tasks, particularly in industrial organisations and particularly at subordinate levels in these organisations, are unsatisfactory from the point of view of the personal needs, development and even health of those who have to carry them out. This problem is at last attracting attention and there is much concern with reform. If reform, however, is not carried out with an understanding of organisational contexts, the new structures will not work or will not last. Secondly if the enthusiasm of reformers leads them to overemphasise one factor in the situation (such as participation) at the expense of others (such as money, or security, or the needs of others than shopfloor operators) the next generation of reformers or researchers will pull down the whole edifice including the valuable parts of it.

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* Lupton's research is mainly concerned with shopfloor response to incentives, but he shows incidentally that this response appears to differ in different market situations.

It is a process which in English is called throwing out the baby with the bathwater, and in the field of applied social science there is already some experience of it. The excitement of a new discovery, particularly discovery of a way of righting something experienced as wrong, carries within it the seeds of its own destruction if it leads to exaggeration. F.W. Taylor himself, after all, the arch-priest and nowadays perhaps the arch-villain of "scientific management", was only over-reacting to obvious inefficiencies which he witnessed: workers deciding how to produce a part guided only by their own skill and past experience and holding their knowledge as trade secrets, with no concern for any wider systemic needs.

Enthusiasm which is not rooted in reality or, more usually, which is based on a partial view of reality, takes on the characteristics of an ideology, and there are many ideologies current in industry today: for management by objectives or M.B.O., for management information systems or M.I.S., etc. etc. There must not be another fad called participative job design, or P.J.D. The nature of work is too important.

II. THE HISTORY OF WORK ORGANISATION - ASSUMPTIONS AND RESPONSES

For about 150 years from about 1810, the choices made in the design and organisation of work have tended to be in the direction of rationalisation, specialisation and the sub-division of tasks, and the minimising and standardising of skills. With every new discovery of science the intellectual exitement surrounding the discovery very quickly gives way to the equally exciting search for ways of making use of it, either by incorporating it into new products or into new techniques or processes. Thus, first in manufacture and later in administration, the knowledge and methods of the natural sciences have been put to the task of discovering methods of working and organising which would give economic and predictable results.

In this search, the criteria have been the twin ones of economic benefit on the one hand and predictability and control on the other. In the process some other criteria were neglected, as many critics have pointed out.

Davis(14) has made a study of the criteria and practices currently used by those involved in job design in the United States. Among the summary of his findings are the following on design criteria:

The content of individual tasks is specified:
(1) so as to achieve specialisation of skills
(2) so as to minimise skill requirements
(3) so as to minimise learning time or operator training time
(4) so as to equalise and permit the assigment of a full workload
(5) in a manner which provides operator satisfaction (no specific criteria for job satisfaction were found in use)
(6) as dictated by considerations of layout of equipment or facilities and, where they exist, of the union restrictions on work assignment.

Individual tasks are combined into specific jobs so that:
(1) specialisation of work is achieved whenever possible limiting the number of tasks in a job and limiting the variations in tasks or jobs
(2) the content of the job is as repetitive as possible
(3) training time is minimised.

Davis points out that these criteria are governed by consideration for the immediate cost of performing the required operation, while the total long-term economic costs of a job design are not taken into account. Ideas about human asset accounting are in their infancy.

It must be remembered, however, that other assumptions and anxieties of engineering designers than those concerned with costs play a part in the process as well. Engineers often attribute to economy innovations which are really made for reasons of control, and the cost of the control systems themselves is frequently ignored. It is deeply rooted in science and engineering training that knowledge means measurement and control, and the human sciences are thought to be immature or inadequate in so far as they do not produce the kind of knowledge which makes human material as predictable or controllable as chemical material.

In this tradition and from this training base the less easily measurable aspects of human behaviour create anxiety for engineers, who have therefore tended to make use in their design

thinking of only those human characteristics to which engineering-type measures could be applied - selection tests for aptitudes, fatigue allowances incorporated into incentive schemes for reward, more recently statistical projections for manpower planning, etc. There is a tendency for the precision and validity of such measures to be over-estimated, while the precision and validity of, for instance, experience are under-estimated.

Engineering designers know, of course, that human beings have other characteristics as well, but they have great difficulty in incorporating this knowledge with their other knowledge, to make it part of their operating reality. Quite non-threatening aspects of human dynamics, for instance the fact that people set themselves sub-targets in order to experience achievement and measure progress (with its implications for batch size) or that they do not work at a constant pace throughout the day but vary their working pace (with its implications for buffer stocks) (15) have not found their way into design strategies. Where they are allowed for, it is generally by accident. An intuitive awareness that important aspects of human behaviour have not been allowed for in production design probably makes the designer experience the people in the system as a puzzling, if not threatening factor. In recent years the growing power of organised labour, too, has no doubt added to this anxiety. As a result, an engineering designer is likely to feel most pleased that he has found a design solution when he has designed a human operator out of the system altogether, frequently in situations when this answer is not the most economic one or the one which makes the system work well. Controls are often left permanently on "manual" by people with operating experience of what a system really needs.

A number of responses to this situation can be identified:

a) Criticism

At an intuitive and descriptive level, rationalised production methods have been criticised for a very long time. Marx already produced detailed critical descriptions of the work carried out by people in different technologies, and the effects on personal and social life. The conclusions he drew, however, were not about the design of jobs but about ownership and about macro-economic structures.

W.F. Taylor's book on "Scientific Management" (16) was published in 1911. Already in 1915 there appeared a detailed critique based on an investigation of scientific management in its relation to labour, made for the United States Commission on Industrial Relations by R.F. Hoxie. (17)

The date of publication makes this a fascinating work. There is criticism of unsubstantial claims to "science", of poorly trained practitioners jumping on to the bandwagon set in motion by more responsible workers in the field, of over-simplifying and lumping together methods which in fact vary considerably, criticisms which are relevant to other "movements" than that of scientific management. All this is in addition to discussion of the effects of these techniques which are more what one would expect: that the economic benefits are very great, that the social effects are not the beneficial ones claimed but are in fact frequently harmful, and that ways must be sought to retain the first while reversing the harm done by the second.

b) Accommodation

There are many ways in which workers have dealt with the production situations in which they find themselves. These may include accepting and sharing the value systems which underlie the production organisation, withdrawing attention from it and becoming apathetic, saving their energies for the non-work aspects of life, etc., etc. The kind of accommodation to which I want to draw attention here is the one which finds areas of freedom and control within the work situation itself. There are very many cases where, precisely because the methods of "scientific" management are not as scientific as all that, loopholes exist which have enabled workers to regain a considerable measure of control over their own work situation. Individual piecework is a good example: in many industries it is popular, not only because of the possibility of high earnings, but also because it makes people to some extent responsible for their own earnings, frees them from close personal supervision and gives them a feeling of independence. In addition, the process of deciding the time for a job is itself susceptible to manipulation and the battle of wits with time study has the function of adding stimulus to an otherwise dull work situation. There may also be considerable opportunities to optimise one's personal resources of time and energy in the way that output is recorded. The pieceworker who works very hard on Thursdays saves the pieces overnight and feeds them in on Fridays so as not to be too tired for the weekend is, after all, being entirely rational.

This has obvious implications for redesign activities. Attempts to introduce new freedoms may interfere with areas of freedom which already exist. It is yet another reason for reiterating the need for detailed and realistic diagnosis of existing situations where redesign activities are envisaged. It also points the difference, theoretically and methodologically, between redesign and new design. Finally it points to the need for experience, flexibility and sensitivity on the part of practitioners who get involved in redesign activities. There seems little value in replacing the solutions of the more rigid and doctrinaire production engineering with those of rigid and doctrinaire social science.

c) Continuing Enthusiasm

The main trend in the design of work organisation continues to be in the direction of specialisation and external control. Although there is a growing number of experiments in other directions, nowhere has "critical mass", or anything like it, been achieved for alternatives. What is growing steadily is an awareness that current work design is from some points of view sub-optimal. Those who have experience of existing technology, and who are in everyday contact with operators and with production problems, are frequently very willing to acknowledge this and very ready to consider ways of modifying existing systems. Their main problems stem from the fact that large sums are already invested in the existing systems.

It is truly tragic then to see the same mistakes being made in the design of new technology. The over-riding enthusiasm engendered in young designers by new technical possibilities, such as automatic process control or data processing, has led in some instances to the same attitudes of omnipotence as inspired the early industrial engineers. Very large projects are designed by computer consultants in swift succession, and the career development position for systems analysts has been such that they often do not stay in a position long enough to learn about the operational problems that ensue.

In process control, there are subtle but important differences according to whether tasks are designed so that operators monitor the process, i.e. respond automatically to signals which leave only one course of action open, or control it, i.e. respond to symptoms and make decisions about action. The differences, and the skills which are in reality still required, are not always recognised.

Research on computer-based information systems points out that every system design contains an implied model of the user, and that this model may be inadequate and is likely to be influenced by professional ideologies. (18) Three kinds of model which can be discerned from existing systems are a) that the user is wholly rational and knows what he needs (which is like asking someone if he wants an apple when he has never seen or tasted one), b) that the user is wholly irrational and should be designed out of the system, and c) that it must be optimal to routinise existing systems (which is like saying that since a horse is a means of transport, every horse should be replaced by a lorry and all side-effects will be beneficial).

So-called "decision rules" imply that the user is a mechanism and all that needs to be done is to design a system which outputs details of the action the user is to take. At the other extreme, the assumption is that the user is the best judge of the information he needs. Neither of these assumptions match reality. Much more complex assumptions and models of reality have to be postulated, and this means that development needs to be in terms of much more highly interactive systems:- Systems must interact with their own past, i.e. development must be evolutionary and build on experience; and systems must interact with the user. It is the only fruitful way of making the best use of the two resources, a) of a complex model of man, and b) of the systems designer who appreciates what formal information systems are capable of doing. Without such interaction, on a continuing basis, the goals and values implied by systems which are produced are not necessarily those intended by the users.

d) Rejection of Technology

In the last fifty years there have developed two manifestations of a flight from technology. The first took the form of the "human relations movement". It has its roots in the work of Elton Mayo and the Hawthorne experiments,(19) which drew attention to social relations as an important factor in the work situation. As a result there have been considerable attempts, particularly in the United States, to modify the behavioural styles of supervisors and managers and the quality of personal relationships at work, usually through sensitivity training or the intervention of a "change agent" in working situations.

This kind of training and intervention, however, tends to focus exclusively on relationships, treating the social systems as self-contained, and to pay little attention to tasks, either the task of an organisation as a whole or those of individuals. At best it is hoped that individuals who become sensitised in this way to relationships at the work place, will themselves begin to direct a new kind of attention to their tasks. Experience frequently shows, however, that such individuals become fascinated by their new human relations experiences and want to continue developing them, sometimes drawing even further away from considerations of task and technology. It can happen, therefore, that organisations simultaneously pursue human relations programmes which emphasise open, participative and democratic styles of behaviour, and industrial engineering or other management service programmes aimed at centralising and tightening control and closing up loopholes. The difficulty of bridging this gulf between the wish and the reality is not made easier by the sophistication of many managers nowadays who, in the Anglo-Saxon countries at any rate, are familiar with the human relations literature and talk with ease of "Theory Y"(20) and "System 4"(21) and "9-9 Management"(22).

The second manifestation of the rejection of technology is more recent, more internally consistent and more relevant to the European situation. It is the fact that many young people, whose education has been longer in duration and less authoritarian in style than that of their parents and who do not have memories of economic hardship, simply do not want to work in industry. Their years at school have not prepared them for work which is subordinate, monotonous and lacking in self-direction and the use of skill. It is this which lends urgency to the need to reconsider the organisation of industrial work and it is indeed this which underlies many of the experiments which are already going on and particularly the widespread programme of experimentation which is going on in Sweden.

III. RESEARCH AND DEVELOPMENT IN NEW FORMS OF WORK ORGANISATION

Research on the relations between the technical and human aspects of production systems goes back to the early 1920's.(23) Studies carried out by members of the Tavistock Institute of Human Relations from the later 1940's onwards were in this tradition, but had a number of additional distinguishing features:

a) they led to new kinds of conceptualisation;

b) they incorporated analyses of social organisation which were based on research and experimentation in group functioning;

c) they were programmatic, that is a body of inter-related concepts, theories and methods was (and is being) developed and tested in the course of a number of inter-related studies. This must not be seen in a romantic light, as there were in fact many set-backs, problems of sanction, finance, etc. But it is an important point to remember when one is considering institutional bases for research;

d) the social scientists were not merely observers but were actively involved in experimental change. There were two kinds of action role, that of the action researcher and that of the consultant. The methodological examination of these roles formed part of the research.

In the well-known studies of technical change in coal mining (24) it was observed that optimisation of the technical system could interfere with the social system in such a way that overall results were sub-optimal. Before mechanisation a small group of multi-skilled men had been responsible for the whole cycle involved in coal-getting. This included:

a) preparation, concerned with making the coal more accessible and workable,

b) getting, in which the coal was loaded and transported away from the coalface,

c) advancing, in which roof supports and other equipment were moved.

Under the new method this cycle was extended over three shifts, with each shift only responsible for one part. It was found that the workers no longer felt responsible for the completion of the job or had feelings of responsibility towards the workers on the other shifts whom they never met on the job. In addition all the controlling and co-ordinating activities now had to come from outside and above the teams, since no-one at the workface knew the whole story. The expected increase in productivity did not materialise.

The concept which emerged at this stage was that it is the interaction between the technical and the social systems which is crucial.

A second series of coalmining studies revealed a number of composite autonomous work groups; long-wall faces where the total group of more than 40 men working on a three-shift cycle had organised themselves as an autonomous group. Cohesion was in this case maintained by a work-rotation scheme which had evolved both within and between shifts. It became clear at this stage that the same technological system can allow for a choice, at least within a range of feasible social systems.

The possibilities of socio-technical analysis, and of exercising organisational choice, marked an important turning point in the development of work organisation.

An opportunity to develop these concepts further and apply them in practice arose in Norway. The frame reference in that instance was that of Industrial Democracy. In 1962 the Norwegian Confederation of Employers (NAF) and the Trade Union Congress of Norway (LO) instituted a programme to explore the question "Under what conditions can more rights and responsibilities be achieved for the individual in the Workplace?" A two-pronged research programme was developed:

Phase A - a study of existing Norwegian and other European experiences with mechanisms that allow formally for employee representation at top management level.

Phase B - a study of the roots of industrial democracy in the conditions for personal participation in the work place.

The joint committee and the research team concluded that the way in which employees participate in the actual work life of their companies is critical for the use they make of formal mechanisms for representation and consultation. Emphasis was therefore put on Phase B, a programme of planned experimental changes.

In the course of this phase a good deal of theoretical work was done, both in the further development of socio-technical systems theory and in the elaboration of new criteria for job design. These have been published elsewhere,(25) but it is worth repeating them briefly here:

1. <u>At the level of the individual</u>:-

   (a) Optimum variety of tasks within the job.

   (b) A meaningful pattern of tasks that gives to each job a semblance of a single overall task.

   (c) Optimum length of work cycle.

   (d) Some scope for setting standards of quantity and quality of production and a suitable feedback of knowledge of results.

   (e) The inclusion in the job of some of the auxiliary and preparatory tasks.

   (f) The tasks included in the job should include some degree of care, skill, knowledge or effort that is worthy of respect in the community.

   (g) The job should make some perceivable contribution to the utility of the product for the consumer.

2. <u>At the level of the group</u>:-

   (h) Providing for "interlocking" tasks, job rotation or physical proximity where there is a necessary interdependence of jobs.

   (i) Providing for interlocking tasks, job rotation or physical proximity where the individual jobs entail a relatively high degree of stress.

   (j) Providing for interlocking tasks, job rotation or physical proximity where the individual jobs do not make an obvious perceivable contribution to the utility of the end product.

   (k) Where a number of jobs are linked together by interlocking tasks or job rotation they should as a group:

(i) have some semblance of an overall task which makes a contribution to the utility of the product;

(ii) have some scope for setting standards and receiving knowledge of results;

(iii) have some control over the "boundary tasks" (i.e. tasks of service or voluntary character).

These criteria were not intended to be final. For instance, they were developed at a time when concern for ecology and sensitivity to third-world needs was perhaps less than it is now. But it is important to understand that they are not "merely humanitarian", in a welfare sense. They are systemic: when work roles are designed in a way that takes account of psychological and social realities, systems function better. To give a small example, from personal experience: in a conventional work study programme in a small hospital, it was decided that nurses should no longer take specimens from the wards to the pathology laboratory for testing. Instead a porter, with lesser pay, was introduced to perform this unskilled task. As a result, the scheduling of work in the pathology laboratory got more and more out of line with the needs of the wards, and the relationships between the two departments deteriorated sharply. When it was the nurses who had taken the specimens to the laboratory technicians (overlap of roles) each had been kept aware of the other's needs and had, probably without thinking too much about it, made adjustments.

These developments were, of course, not the only thing which has been happening. Another important stream of development during the last fifty years has been in the field of ergonomics. Ergonomists have, on the whole, concerned themselves with two kinds of things: with defining the conditions, either in the environment or in the requirements of a task, beyond which it would be damaging to the health or beyond the capacity of the human operator; and with designing tasks, in the positive sense, so that optimal use should be made of the known, or experimentally verifiable characteristics of human operators. In this, ergonomists have tended to limit themselves to the more readily measurable and observable human characterisrics, and to removing difficulties in the way of performing a task, rather than with such vaguesounding things as commitment or autonomy. They have, on the other hand, become positively involved in the design of technology and are used to collaborating with engineers in design. In the socio-technical systems work described so far, major re-design has tended to be of the organisation around technology. The research workers have not, on the whole, got into the design of the technology itself. It will be very important to bring the criteria of the social scientists and the methods of the ergonomists closer together. One such method, for example, is the systematic testing of alternative solutions before investment in plant or equipment is committed.

Such methods are costly in their use of time and skill but expenditure would seem to be most worthwhile before large sums are irreversibly invested. The timing of design processes, in particular, would be affected. When attempts are made to include a social science contribution to design it can happen that, though everyone on the design team is willing to try, time schedules do not permit the research and testing activities which the process implies. The high cost would seem to be most clearly worthwhile in the design of new technologies. ("New" of course begs the question. Very few situations are wholly new, it is a matter of degree.) If legislation is being considered, it would be worth considering the suggestion that a percentage of the cost of new capital projects should be spent on activities explicitly concerned with the design of the roles in the system from the point of view of the needs and characteristics of the people who will be using the system.

The idea that human characteristics, not only in the sense of limiting characteristics but in the sense of emotional and developmental needs, should feature explicitly in the design of working situations spread very slowly at first. From the later 1960's onwards, however, it began to spread more rapidly, and 1973 and 1974 have been characterised by an explosive growth of interest, at least at the level of public discussion and the media. There is also an increasing number of professional conferences, meetings and seminars, with some risk that the same participants keep meeting each other, while some of the better-known experiments become busy centres of scientific tourism.

The number of field experiments and programmes of change has not grown nearly as rapidly as the amount of public discussion, but it has been growing too. There are now probably about 200 documented case studies available. Mostly such experiments have developed at the level of individual firms and organisations, but in some instances the support, or at least the monitoring, of changes has become institutionalised at wider, including national, levels. Some of the systemic implications of all this activity are already becoming apparent. For

instance in Sweden one large engineering school makes it compulsory for all engineers to learn some ergonomics and industrial psychology, while plans for the new technical university at Luleå include substantial blocks of behavioural science teaching for technologists.

IV. THE NEXT GENERATION OF ISSUES

a) CONGRUENCE

Changing the nature of work implies nothing less than a culture change. The difficulty of making such a change lies in the fact that individuals have made adjustments to the earlier situation, and institututions have grown up to deal with it. Therefore, while there are indeed a large number of experiments now taking place, they still form a very small part of the job design scene. The culture change is a new and tender plant, and it is quite possible that in a difficult economic climate some change programmes may be postponed or discontinued. At a time when economic problems are again beginning to loom large, questions may well be asked about the degree of priority, or even the relevance, of changes such as the ones that have been described.

The experiments which falter are likely to be those which are not yet wellrooted, or which were only undertaken for reasons of fashion. Those which continue developing in a difficult situation are also likely to be of two kinds: those that have already given their organisations a new kind of flexibility and resilience, and those which are in any case congruent with their environment.

In the long run these change programmes will exert influences of their own and may themselves lead to new institutions, organisational forms, and technologies. They should lead to a greater interpenetration of boundaries between industry and the rest of society, lessening the split between the values expressed in the working arrangements of society and the values expressed in its other institutions. Nevertheless, there has to be some congruence between these experiments and their environment. They have to make sense in the economic context (in that they do not lead to bankruptcy), in the technological context (in that they are feasible), in the industrial relations context and in the organisational context. These latter two will be discussed in a little more detail.

The Industrial Relations Context

The amount and kind of trade union involvement varies very widely indeed. As Delamotte puts it, "Union attitudes to the quality of working life may differ from one country to another, within a country from one enterprise to another, and even within an enterprise from one plant to another. Within a workers' federation, positions taken at the top towards the idea may not be reflected in positions taken by a local union, confronted with practical changes." (26) For each individual trade union movement there is currently a process of working out what congruence there is between its own structure, history, and thinking, and the new developments.

New developments in industrial relations are in fact proceeding on a number of different lines. These include:

(a) systems which institutionalise the participation of workers' representatives in decision-making within the enterprise;

(b) systems concerned with the distribution of wealth and income;

(c) systems concerned with decision-making in the economy;

(d) task design and organisation.

It can happen that conflict or competition arises between the proponents of these various lines. This is partly because personal identity and careers become attached to them, partly because people do not have the time or the energy to pursue them all, partly because they fear that attention paid to one may lessen the attention paid to another.

In particular, one of the most important issues to tackle in the immediate future is the relationship between new forms of work organisation and representative systems of participation. It would be very sad if these were to be regarded as alternatives. Increased opportunities for growth and development of the worker at the workplace do not do away with the need to

defend collective interests; and representatives will not want to deny opportunities of personal development to their constituents. The possibilities for integrating the two kinds of development with each other are very wide. The patient must not be left to languish while the doctors argue.

The Organisational Context

There are two kinds of organisational pre-conditions, those concerned with the climate of opinion, and those concerned with structure.

(i) Climate

The question is often asked whether it is essential for a change programme to have support from the top of an organisation. What is essential in any case is support from people who are senior enough to make decisions. It is also essential that there should be continuity of support. Modern management development programmes may mean that managers move from post to post rather often, and this cuts across many kinds of project work. People who have learned to work together need to be allowed to work together long enough for the work to be effective; in any case, no-one feels as committed or enthusiastic about a project he inherits as a project he initiates.

There may be differences, too, between top-level policy statements and actual events. Policy thinking and action relate in various ways in a large organisation, and it is often better to deduce policy from what actually happens than from formal statements. Policy statements from the top give an important impetus, but it is at middle levels, where people have to translate them into action and deal with the consequences, that the reality is tested.

One important effect of the kind of changes that have been described has been on the role of supervision.

There is no doubt that, when individual workers or groups of workers become self-regulating, the sheer amount of external control which is exercised over the work process must decrease. What then happens about the roles of supervisors and management can vary. In the Ahmedabad experiments, for instance (27), it was top management which withdrew from involvement on the shop floor; the role of supervision was strengthened, but it was also changed in the direction of managing the boundaries of the system, i.e. its relations with the outside world, rather than controlling what went on inside it. Some supervisors in the new situation speak of themselves as "human resources managers", i.e. concerned with training and group relations. These two functions, of boundary control and the management of human resources, open up important new channels for the development of supervisory roles, and consequently new training needs.

In other situations the number of supervisors, and sometimes the number of levels of supervision, has simply decreased. How this is handled has varied, from carefully planned retraining and re-deployment to a certain callousness - "Supervisors have been on top for so long, don't ask me to worry about them now". One British company decided not to go ahead with an experiment when it became clear what the effect would be on their supervisors.

It is no wonder that some foremen's associations are antagonistic to the new developments. Working towards long-term societal goals has to be combined with handling the realities of the present day, and these include the existence of large numbers of real, live, hard-working and probably worried supervisors. It is a new version of the old problem of whether ends justify means, and none the easier for that; but handling it in a creative way which sacrifices neither ends nor means would seem to be a crucial test of adaptive capability. Merely designing Utopias is easy.

Another question frequently asked is whether it is possible to encapsulate the redesign of a job, or whether it must inevitably lead to other changes. Opinions differ on this: while a number of job enrichment exercises turn out to have remained encapsulated, it seems unlikely that one can plan for this to happen. The limits to development tend to be unpredictable, it is an open process. One thing is asserted with confidence by people who have been involved with such projects:- there will at the very least always be consequences for training, and there will always be consequences for payment systems.

The question seems, in any case, the wrong way round. There seems little point in launching on an experiment if it is not congruent with other developments in an organisation. Some minimal steps must be taken at top management level to make it relate to the overall strategy and circumstances of the organisation.

(ii) Structure

The need to relate changes in job design to the wider organisational context was emphasised earlier in this paper. Butera, in his account of the experiments at Olivetti, traces how particular economic, technical and social environments may or may not make these changes possible and how in fact the changes are sometimes enforced by changes of market, technology or labour force.(28)

During the time leading up to the changes, the market for Olivetti products was becoming more specialised, more demanding in terms of quality needs and open to stronger competition. This meant that the range of product appeared in an increasing number of models, and the life-time of the products became shorter. At the same time the rate of change in products was also speeded up by continuous innovation in electronics technology. In manufacturing terms this meant a wider range of different products and models, short product life-times and frequent modifications.

Two different reorganisations of assembly lines have taken place, one into independent sub-assembly units, leading to a final assembly, and one into integrated units of thirty people assembling a whole product.

Butera insists that the nature of this new organisation was not merely due to "organisational imagination", or to labour market factors, morale, or union demands, though all of these played a part. In addition to them, and greatly reinforcing them, there were:

(i) changes in the design of the product, which now consisted of more highly specialised mechanical groups, relatively autonomous from the point of view of function and "interrupted" by the electronic parts. This made sequential assembly less logical as the mode of production (in turn, if it is desirable to change modes of production, the help of product designers is likely to be needed).

(ii) the market conditions which have been described, which imposed the need for a high degree of flexibility as regards quantity, as regards models mix, and as regards the time scale within which changes were made. In order to achieve such flexibility, they had to avoid the need to re-design and re-balance the assembly line every time a variation occurred, and a "cellular" mode of production, which also involved more highly skilled and flexible people, was much more appropriate, greatly improving the organisation's ability to absorb variances.

However, such solutions are not found automatically: the debate within management on how to improve working life, and the Unions' pressure against alienating work oriented the research which went into the solutions, accelerating them, defining their details and supplying urge and enthusiasm to implement them. The Olivetti case, in fact, shows the complex interaction between structure and climate. The process logic must be in harmony with the logic of product design, and there must be people who think this way. Conversely, when people begin to think this way, their product design thinking will be influenced too.

b) ISSUES OF THEORY AND METHOD

Evaluation

The evaluation of complex changes presents big methodological problems. For one thing, the changes need to be evaluated in terms of the aims of those who initiate them, which may vary considerably. Some have as their aim the solution of a specific problem or symptom, such as recruitment or absenteeism; in some programmes, productivity measures feature largely, at least as limiting conditions; in some, the interest, excitement and idealism of the experiment itself is the mainspring and sufficient justification, with productivity losses thought worth bearing and improvements considered as unexpected bonuses. Secondly, "those who initiate" experiments may not be easy to identify, since there may be differences between the aims of different parties in a situation. Thirdly, there are usually a number of changes going on at the same time, not all of which form part of the experiment.

Detailed evaluation may therefore be as complicated and expensive an exercise, and require as much expertise, as the experiments which are being reviewed. If carried out on any large and systematic scale, it brings additional problems of possible interference with the original experiment. Finally, cynics can always raise the unanswerable question of objectivity which is created by the relationship between evaluator and evaluated: if they are the same person

or group, they may be thought to be biased, wanting the experiment to appear in a favourable light; if they are different persons or groups, the evaluators may be influenced by separate aims of their own.

The Interpretation and Use of Concepts

One group of problems stems from the fact that the concepts involved in socio-technical systems theory were formulated at a very high level of generality. The scientists who originally worked with these concepts knew what they were doing, but little has been done to codify this knowledge and make it operationally available. It is easy to agree that the enterprise is an open socio-technical system: it is a little hard to know what to do next, if one's own learning and experience have not been within this tradition. Systems terminology is in any case on the whole very general. At an operational level "the systems approach" means many different things to different practitioners, who frequently do not define what they take to be the system and what the environment, and which of very many parameters they are tackling. It is an important next task to provide the tools for socio-technical analysis.

In the absence of detailed analytical tools and their spread though training, a number of myths have grown up: for instance, that the answer must always be an autonomous or semi-autonomous group, that any group is better than no group, that work groups are formed by putting people together, without regard for their roles and inter-dependencies, that autonomous groups have to be small, etc.

A corollary of the situation where concepts have not been codified and made operational is that no recognisable body of practitioners has been trained, and this has been one of the biggest obstacles to diffusion. When interest is aroused there is no-one trained to meet it, all manner of people jump onto the bandwagon, and all manner of odd things may happen.

This brings us into the area of professional training and, even more basically, into the traditional academic disciplines as they are taught in the universities. The practitioners involved in change processes may come from a variety of sources - from engineering, from the social sciences and, very importantly, from the trade unions. The culture change will not really have taken root, however, until basic engineering training, too, includes the concepts and strategies which are relevant to placing man nearer to the centre of the design process. Economic criteria (which also are non-technical) already feature routinely in the training of design engineers. There is no reason why human and social criteria should not feature there in the same way.

In some professional training courses people like industrial and work study engineers and operational researchers are taught a little about human motivation, and exhorted to take account of the social consequences of what they do; but they are not taught how (for instance, how to analyse a role in all its aspects). Therefore, when such practitioners invite the collaboration of social scientists, they usually mean that the social scientist should help sell their project; or they bring him in too late, when the important design options are no longer open. As one research worker put it, "they say 'we'll do it this way, now you go and make the people happy'".

It is also relevant here to mention social science. There is a challenge to the social sciences to get involved in action and not merely in critique. Professional training (as distinct from theoretical teaching and research) is available in applied psychology, and for social workers of various kinds. Professional training and the methodology of applied social science are very rarely available for people who work with industrial situations.

In the natural sciences there is clear recognition of a development function, which forms part of the "Research and Development" continuum. In social science the means for financing research generally exist, but the needs of "development" are not sufficiently recognised. It means action research and consultancy (not management consultancy, which is something quite different). It is not generally a matter for laboratory experimentation, but of working with real problems in real situations, and it raises problems of professional training, of finance, of how to get programmatic rather than piecemeal development, and of the ownership of results.

There is a second set of problems involved in working with socio-technical approaches. It has to do with the potential conflict between strategies which are aimed at finding better solutions, and those which are aimed at enhancing learning; and, in consequence, also with the role of expertise.

The idea of joint optimisation of the social and technical sub-systems could be interpreted in the sense that a better state (by implication a "final" better state) can be defined and reached. This is a static model, which conflicts with the criterion of continuing learning. Optimisation can just as well be seen as a continuing process. The experience of the change is itself part of the situation and changes it, and that is a different model from that of working towards a blueprint. Which one people prefer will depend on their need for security and defined boundaries, which will also influence whether they regard the criteria themselves as rules to be accepted or reviewed.

Most difficult of all, however, is not merely to regard this as a conflict of ideology or personality, but to grasp the idea that both these models are appropriate in different situations. A good strategy is to start with the aim of finding a solution, but with a further aim of then moving towards a learning model. The other way round, of discarding all structure at the outset, can be painful and paralysing. Most confusing of all is the situation where people try, without realising it, to operate both these models simultaneously. It is illustrated by the researcher who said: "Now they're going to introduce participation by numbers."

Allied to all this is the question of the role of expertise. In some circles the value attached to self-determination has become so dominant that any form of expertise, too, is rejected as being too authoritarian.

Some of the current experiments rely on new kinds of knowledge being introduced into design and organisation, while others rely on the growth and creativity involved when people organise and discover things for themselves. Among professionals in the field there is a debate about "designing for" people as distinct from "designing with" them. A whole range of design strategies is possible, combining elements of "for" and elements of "with". For example, a strategy which is essentially "designing for" can include phases of feedback and testing-out which involve the people in the situation; or a strategy which is basically "designing with" can include commissioning an expert to report on existing knowledge or to carry out some experimentation. A great deal in any case depends on the personal integrity and even style of the expert, and the confidence and trust he manages to earn.

A problem confronting those who value the process of self-determination in organisation design more highly than the content of the outcome is that of diminishing returns. Those who learn most from the process of design and reorganisation are those who take part in it. But they, too, are designing "for" someone else, since working groups and populations do not remain static and new members join. Therefore, either the new situation has to be so clearly satisfactory that newcomers will be content to pick up where their predecessors left off; or, on the other hand, review and experimentation and change need to be built into the culture on a continuing basis. It can happen that autonomous work groups become so enthusiastic about what they are doing, and so confident and self-contained, that they have difficulty in absorbing newcomers or relating to the outside world. That has to become the next phase of learning.

c) DIFFERENT SOLUTIONS

The recent experiments fall into two clear types. On the one hand there are those which aim in the first place to make tasks and work roles more intrinsically satisfying. On the other hand a substantial number of experiments have as their starting point the aim of giving the worker more scope for making decisions, either about matters intrinsically connected with his task, or about matters only partly connected with it. These may reach out into such things as work allocation, production scheduling and quality control or into personnel policies such as selection and promotion, or further. Some of this then begins to merge into existing or newly devised representative systems.

Where the new work organisation has involved the setting up of autonomous or semi-autonomous work groups, there is a great deal of overlap between the two frames of reference. However, they do not necessarily lead to the same solutions. Re-distributing power, or "democratisation" of the work place, and "Humanisation" of the work place are not necessarily the same thing.

d) THE POLITICS OF HELPING ROLES

If one is using a systems framework, then the characteristics of helping systems are also

relevant to what happens. Those who are in helping roles - industrial engineers, management service people, social scientists, trade unionists - have needs of their own. These needs concern money, training, careers, autonomy, development, the need to make a contribution, in fact all the factors which apply to those who are clients or the subjects of research. If these needs are not catered for openly, they may get repressed and can emerge in some covert form which exploits the client. It is therefore important to be very explicit about the relationship between client and helper, and to take a lot of care in working it out.

The pressures of career and development needs among those in helping roles have led to a certain amount of competition between them. This is true in society at large, where property-rights to certain problem areas may be disputed; within individual organisations, where the relationship between different service departments may cause problems; or in the development of specific projects. The problem is not so much who has a contribution to make, as who has the right to diagnose. Clients have been known to take advantage of this situation and play helpers off against each other in order to avoid real commitment.

Another set of problems arises from the high value put on innovation and discovery. Reputations are not made from continuing a line of development but from finding or doing something new. Politicians and members of steering groups, as well as people directly involved in research or application, all wish to make a distinctive contribution. This creates scope for continuing innovation, but it may hinder the development and diffusion of that which has already been achieved. It is one reason why there are so many cases and so few programmes.

Something also needs to be said about politics in the other sense. In the Anglo-Saxon countries, "politics" in social science tend to be about competing schools of thought in theory and method, career pressures with consequent pressures to publish, and the competing claims of different institutions for assignments and research funds. In some continental countries, the alignment of social scientists on party-political lines has become an issue as well.

While hardly anyone claims any longer that social science is value-free, there are differences in the role that personal values play in the work of social scientists. In one tradition, the value judgement is made when one decides whether or not to accept an assignment. After that, the social scientist's task is to help the client organisation clarify its own values, become aware if it is in fact operating within them, and deal with areas of conflict. He can only help in this way if he is accepted by all members of the organisation as being non-partisan. There are other social scientists who openly declare that they are on one side or the other and intend to help that side, or that they are working for some perception of "society" outside the organisation. These are in fact declarations about who is the client. They are not unprofessional if they are open, and if those who are not the client are free to choose whether to collaborate or not.

e) PUBLICITY

Another problem has recently arisen around the question of publicity. New forms of work organisation are currently attracting a good deal of public attention and publicity through the media. It is of course vitally important that there would be as widespread information and discussion about these matters as possible. For the people actually involved in the projects, however, publicity can present some rather complex problems. In one organisation, the tactless behaviour of a television crew almost destroyed, and certainly inhibited the progress of the experiment.

There are problems for those who are in the public limelight and who may be well aware of the complexities and problems involved in what their organisations are doing but feel compelled to defend it and in the process to simplify it; their constituents back home may sometimes find it difficult to recognise the public descriptions. There are problems for those who are not in the public limelight but who are doing equally interesting and valuable things. There are problems when groups which attract attention come to be regarded, and to regard themselves, as elites. There are problems concerning the time and energy required to deal with visitors. (In one organisation, which had prepared a film about its experiment, the film projectionist complained that he should be paid compensation for the boredom of having to keep running the film!) Publicity, as some organisations are discovering, can be a two-edged sword.

V. POLICY-MAKING AS A LEARNING PROCESS

The first generation of problems has been about finding ways to humanise the nature of work and testing these in practice. The next generation of problems is about building these ideas more solidly into the industrial and social fabric, and about relating different developments in industrial relations to each other.

How to do this must itself be regarded as a learning process. Western industrial society is in a learning phase, and it is a rather disjointed one. Developments in different countries have been very different. There are big time-lags and differences,

(a) in the evolution of norms and values, and the institutions which embody them

(b) in the development and spread of the relevant methods and concepts

(c) even in the development of simple efficiency. (While some organisations have reached economic levels where they are wondering in which directions to develop next, others are still struggling with an earlier generation of problems. It has to be remembered that inefficient organisations - where "they can't even get the invoices out on time" - are also very frustrating to work in.)

An important factor in this disjointedness is the discrepancy between the speed of change and the speed of communication. An experiment of this kind, as anyone who has taken part in them knows, develops slowly. Information, on the other hand, travels fast; no sooner does a company announce plans for reorganisation, then plane-loads of visitors from all over the world flock in to take a look.

Looking back at the Industrial Democracy project in Norway, Thorsrud and Herbst describe the various institutions that evolved in terms of policy-making as a learning process.(29) It is a basic concept, and it means that the institutions themselves cannot be copied. Both for organisations and for societies it is inviting the risk of costly and time-consuming error to copy patterns and forms which were evolved in other circumstances. Other people's solutions are the result of their experience; this cannot be transferred, though it can spread through working with them. Therefore, while knowledge, ideas and suggestions can be gleaned from other people's experience, solutions have in the end to be worked out for oneself.

For individual organisations, this means that the question is not how to introduce autonomous work groups. The question is what organisational forms can be evolved that are appropriate both to the tasks and to the value systems of the organisation, in the light of economic goals and goals involving human development. This may involve a great deal of work in eliciting what the tasks and the value system actually are.

At societal level, some of the relevant questions are:

1. What are the pressures for change? Basically this implies examining concepts of efficiency.* Change is only likely to be successful if it arises from a felt need and not from a wish to copy fashion. Such a need may be experienced through problems of adapting to changing markets and technologies, or finding that the labour market has changed.

   The need for change may also arise from felt discrepancies between industrial and other value systems in society. What is the relationship between industry and opinion leaders in other fields? How do people in industry feel about it? Are there incompatibilities between the expectations engendered byt the education system and the realities of the world of work? How do they express themselves?

   It is an important debate, but it is also important not to conduct it in a coercive manner. It is extremely difficult to say that one is opposed to something that calls itself "the Quality of Working Life" or "Organisational Development". If people are not allowed to express their real views, then penalties will accrue later, when reality eventually breaks through.

2. If there is a wish for change, what kind of change? Here it is necessary to consider new forms of work organisation in the light of other changes. All over Europe there is currently a spate of legislation and proposals for various forms of increased participa-

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* For a discussion of the social role of production management, see Johansson. (30)

tion. Changes concerning the nature of work itself must somehow find a place in all this, without damaging either representation or bargaining.

3. What resources exist or need to be provided? These are the questions about the institutions of research, training, and higher education. They include questions about the traditional division of knowledge into self-contained disciplines and faculties. When people of high calibre - from whatever background - are asked to apply themselves to industrial problems, they must be enabled, without loss of professional status, to work in a problem-centred rather than a discipline-centred way. This may require the design of new institutions.

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* These papers were prepared for the International Research Conference on the Quality of Working Life held at Arden House, New York, in September 1972, and will be included in the Proceedings which are to be published under the editorship of L.E. Davis and A.B. Cherns.

REPORT OF WORKING GROUP II

METHODS AND ACHIEVEMENTS: "WHITE COLLAR WORK, LIGHT AND HEAVY ENGINEERING"

PRESENTED BY MISS L. KLEIN,
TAVISTOCK INSTITUTE, LONDON

Working Groups II and III, and the preliminary seminars which were held in September in preparation for these working groups, were really created because there are a lot of people with a lot of experience in this field. The working groups were therefore rather amorphous and without a very clear or specific task; the discussion inevitably ranged very widely. I have apologised in advance to my group for not doing justice to the richness of their discussion; yesterday evening I had the choice between enjoying Mr. Spinelli's dinner or spending the evening working on the report, and I believe strongly in the quality of working life.

We were a very diverse group, coming from very different backgrounds, but sharing a common interest in working conditions and probably also sharing a lot of values. However, there was not time to explore these in very much detail. There were certainly some cultural differences, and there were also differences in the circumstances from which we came.

The industrial relations situation in the countries we come from could almost be seen on a scale, from relative harmony between the social partners at one end to all-out confrontation and conflict at the other. This is the first subject-matter on which we think and rather hope that the Commission might be able to play a useful role. We have wondered whether it would be possible for the Commission to get the Trade Unions together, on their own without anyone else there, to discuss this subject-matter and their own attitude to it. We were immensely conscious of the official absence of the Trade Unions from this meeting and how this lowered the potential of what can be got out of the meeting. We noted incidentally that there are other gaps:- middle management is not here, nor are the people in those departments where experiments are actually going on.

I think our anxiety about the Trade Union position is demonstrated by the fact that it was only in the last ten minutes of yesterday afternoon (and incidentally we had a very creative last ten minutes - most of the best ideas came then) that our Chairman pointed out that there is management opposition to these ideas as well, and indeed that the employer/management opposition is likely to be very much greater than that of Trade Unions. If this was better known and made more explicit it might even reassure Trade Unionists that attempts to reorganise the design of work are not merely a management gimmick.

We have to recognise that we now make very great and very complicated and subtle demands on Trade Unionists, because what we want from them is some trust but not too much trust - the ability to consider these experiments but without forgetting their original role, and this is really immensely difficult.

I come now to suggestions for a possible role for the Commission in this. If we have a long list of suggestions, it is not becuase we expect you to take them all up. But this is what you asked for, and you can select from them:

1. Policy

First, and possibly most important, we think the Commission would have a very important role in the creation of climate. We envisage possibly a declaration of intent from the Commission, a declaration of its own values. By this we mean not merely pious hopes and generalisations, but quite detailed statements which have been hammered through with the Social Partners and which are the result of discussions with the Social Partners. We think the propaganda function of the Commission is extremely important. While we are a bit divided among ourselves about the Commission's policy role, and most of us are inclined to say don't make policy - I will come back to that - on the basis of such a general position taking, you might then nudge national governments into holding policy making conferences of their own. You could also do small things: someone suggested offering a prize for the best company annual statement on social policy, in order to encourage annual statements on social as well as economic policy. So the first area is really the propaganda area and it is an important one in terms of setting standards of value.

2. Exchange of Information and Experience

The second area, which my predecessor has already mentioned, is a very big concern for the exchange of information and experience. This does not mean just acting as a post office. The exchange of experience itself creates new experience, it is a very positive role.

There are three categories of activities. The first is meetings; there is scope for many different kinds of meetings:

Firstly, meetings with a political aim such as the one I have already mentioned, of Trade Unionists talking to each other about their orientation to this subject matter.

Secondly, meetings to hear outcomes. We were told that the Italian Ministry of Labour is about to issue a report on ten case studies in Italy, not those of the two best-known companies but others. When such a national status report becomes available this might be an opportunity for you to make it available to other nationals, and for people of the country where it originates to discuss it with others.

Thirdly, there are meetings with a scientific aim. There is a great deal of important scientific work still to do:

For instance, sorting out the relationship between ergonomics and research on working conditions on the one hand, and work on autonomy and personal development on the other.

Working out what socio-technical concepts mean operationally and in the detailed experience of people who have worked with them.

Sorting out to what extent results can be systematized - is there a position between having to work only with a case study or, at the other extreme, looking only for generalisable results; if there is such a position, what is it?

Other types of meetings might be meetings of industry groups - companies which are in the same technology, or similar technology, or linked technologies, so that one can economise on research. Meetings with people whose product influences the working life of others, such as the manufacturers of machine tools. This is one of the things that came up in our final ten minutes, and I personally got rather excited about the idea of meetings between the manufacturers of machine tools and their customers. At 2 o'clock this morning I added another twist to this idea: it would be very exciting if you could get together the people who work equipment, the people who make the equipment and the people who in the university engineering departments do the research and development on it. You are in a better position than small institutes to organise this kind of event, which would of course have to be rather carefully designed. Indeed the whole notion of relative sets of organisations which are interdependent and whose policies constrain or influence each other is one which came out in the September seminar.

We also get here into methodological questions of whether it is possible to do research among groups of organisations, sets of related organisations, and whether people can join together to sponsor research rather than individual organisations only doing their own as now.

A second kind of information exchange is the one involving documentation. It may be a rather obvious one, but there was a plea for short, simple, direct accounts of what is going on being made very widely available, and being made available to ordinary working people and not just to functionaries.

Thirdly there is the possibility of the Commission acting as a main source of information on what is going on, on a rather more informal basis. We were reminded that there are many things now going on in organisations, not with a complicated scientific framework but becuase people have heard ideas and want to try them out informally and on the basis of commonsense. Such people would like to **know what** is going on elsewhere, and may be willing to receive visitors - one got almost a vision of the Commission as a kind of travel bureau.

3. Research

Next we came into the area of research. We don't know whether you want to get into research, but one kind of enquiry which would clearly be appropriate for you to undertake would be to find out who is actually willing to engage in such activities.

Another possibility is the comparison and assessment of results.

Another possibility, and here it becomes a little more controversial, is the question of research to determine criteria and standards for working contition. We had in our group what I suppose one might call "centralists" who look for standards with a general validity, and we had - if there is such a **word** - "decentralists", who do not like to work with such things and who emphasised the importance of working criteria and standards out locally, at the level

of the enterprise or the plant. Certainly the possibility must be mentioned of determining working conditions in terms of standards, i.e. standards about social isolation, about levels of monotony etc.

There is also the question of long term research on the place of work in human life, the relationship between work and non-work, i.e. the longer term and perhaps more philosophical questions.

4. The Commission

There is then a whole group of things which we think are important, but we do not know whether it is your function to deal with them.

At the head of these we put educational matters, and particularly the fact that this subject-matter with which we are dealing here needs to get into the basic education of engineers, accountants and people whose own work creates the working conditions of others. We think it possible that not even God can influence the heads of university departments in designing their syllabuses and we don't know, Mr. Chairman, how your own influence compares. But it needs to be done.

Finally, we think it would be important for the Commission to look at the tasks and work roles in its own organisation. Mr. Chairman, this is a suggestion which I already made in one of the planning meetings earlier this year, and it was received in a spirit of "Dear Lisl, it is nice to see she keeps her sense of humour". I would like to emphasise therefore that this time it did not come from me, but quite independently from members of the working group and also from members of the September seminar. If you are going to take a stand on values, the way you operate your own organisation is going to be a very important indication of them.

WORKING PAPER FOR GROUP III

METHODS AND ACHIEVEMENTS: "WORKING CONDITIONS AND FORMS OF WORK ORGANISATION IN THE EUROPEAN AUTOMOTIVE INDUSTRY"

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1. INTRODUCTION AND OUTLINE OF STUDY

The improvement of working conditions can be regarded as a continuous process, which first met the public eye in connection with the endeavours to improve work organisation that started in Europe at the beginning of the 1960s. If the first to become known through research and experiments were leading firms in the electrical engineering industry (such as Philips and Olivetti), by the end of the 1960s several well-known enterprises in the automotive industry were blazing new trails in job design, which, together with the utilisation of the experience acquired by the "pioneer firms", have led to more advanced solutions and to wider practical application.

In the lights of the measures taken so far in the European automotive industry, two paths of development can be identified:

1. development of new technologies, further mechanisation and automation of work processes.

2. increased application of new knowledge of labour science in the interests of job design.

The following factors are characteristic of the first path of development (1):

- the introduction of new methods of manufacture
  The newly developed shaping welding method can thus replace various processing stages such as casting, forging, multiple heat-treatment and much of the metal-cutting work.

- the application of handling systems
  The automotive industry is a favoured area of application, and the use of such systems is steadily increasing. Great expectations are derived from the consideration that handling systems could be controlled through the machine systems. This means the linking of machines and feeding devices and thus the transition from mechanised to automated manufacturing systems. Recently, more comprehensive use of industrial robots has also been envisaged for assembly work, but this requires more intensive research. Finally, there is

- the automation of the entire manufacturing process
  with the aid of production lines in cases where the economic prerequisites are present.

These aspects of development will be covered by a second report for this conference.

2. JOB DESIGN

The following observations apply essentially to the second of the above-mentioned paths of development, i.e. to the increased application of new knowledge concerning labour science with the aim of improving work structures.

By job design is meant a number of measures from the traditional protection of labour to more equitable structuring of the work and to modern forms of the social structure of the firm.

I. Protection of labour

II. Equitable work structuring

A. Adaption of the individual to the work
B. Adaption of the work to the individual

1. Place of work
2. Strain of work
3. Working environment
4. Job content
5. Work organisation.

III. Social Structure of the firm

Thus the endeavour constantly to improve conventional working conditions (environmental

(1) Hauri, H., Automatisierungstrends in der Fertigung, in: Management-Zeitschrift für Industrielle Organisation, Volume 1/1974, S. 31 ff.

influences, physical and mental strain and stress) is combined with new ideas for the best structuring of job content and changed forms of work organisation. The firm Philips once defined this endeavour, as it generally exists nowadays, in the following way:

"The organisation of the work, of the work situation and the working conditions in such a way that, when the level of performance is maintained or increased, the job content conforms as much as possible to the capabilities and desires of the individual worker".

The situation, as it applies to the automotive industry, has been summed up by the leading men at Renault in the form of three main aims, whose very order implies a sense of priorities.

1. reduction of the physical strain and of the environmental influences which aggravates the work.

2. reduction of the dependence of the worker on the manufacturing process, above all with repetitive activities.

3. creation of a number of jobs with enlarged job content.

But, in the final analysis, more is required than these concrete aims. The endeavours to alter the working environment could also be understood as a search for

- new work forms in a highly-developed industrial society;

- a symbiosis between technical-economic necessities and human needs;

- concordance of life and living conditions in the private sphere with the working conditions in the professional sphere.

And beyond that, there is the question of the point of work in a highly developed industrial society.

3. REASONS FOR NEW CONSIDERATIONS

The reasons for new thoughts about the European automotive industry are the same as for other industries:

- difficulties in obtaining new workers;

- loss of the common ground between employers and employees in the form of language, culture, mentality, and the loosening of provincial and company ties;

- increasing employment of women and foreign workers together with all the accompanying problems;

- increasing fluctuation and absence from the place of work for several uneasily identifiable reasons;

- dissatisfaction with a job which is part of a process which has been divided up through rationalisation and often has become incomprehensible to the mind of the worker.

The following facets of company development often lie behind these easily recognisable causes and these are very marked particularly in the automotive industry:

- radical changes in company structures as a result of fast and unusual growth;

- the necessity for flexibility as a result of world-wide competition;

- the complexity of company management stemming from both causes;

- improvement of the products;

- advanced division of labour;

- application of a highly developed technology.

Many leading companies in the European automotive industry have reacted to the above listed symptoms by experimentation with new work structures. The essential aim of this is to achieve a higher level of work satisfaction while maintaining productivity.

4. STARTING POINTS FOR CHANGE

If the question is asked as to where in concrete terms traditional work and company structures have been changed, three starting points can be determined:

1. Change of the style of management;

2. Change of the work organisation;

3. Re-organisation of the place of work, work flow and working environment.

Even larger companies are making endeavours, following significant realisations, to decentralise, to form smaller and average-sized operating units and workshops and to delegate responsibility - with a view eventually to forming autonomous work teams of between 5 and 30 workers.

In connection with this, endeavours are continuing to break down some of the stages of the works hierachy and to re-organise the relationship between management and other employees. Such problems are clearly more easily resolved in smaller and middle-sized works than in large companies.

The most frequent attempts at change are in the field of work organisation. The majority of these are aimed at changing work processes and methods within a prescribed work organisation by means of job rotation, job enlargement and job enrichment and also at abandoning formal work organisation in favour of small autonomous work teams.

5. ESSENTIAL POINTS CONCERNING IMPROVED JOB DESIGN

Endeavours towards the improvement of working conditions and job content cover the production workshops as well as ancillary units and administrative divisions. In the automotive industry, there are essentially two areas of production in which new developments are accomplished:

- machine workshops, and
- assembly divisions

In the machine workshops, activities involve the manufacture of individual parts, the treatment of component parts and the processing of production parts, which are then assembled into aggregate units (axles, gear units, steering units, clutch units, engines).

The great demand for motor vehicles has led to the application of a highly-developed technology in the manufacture of large quantities of component parts, engines and bodies and to an advanced division of labour. Thus it has been largely possible to replace manpower by machines and handling devices, and by semi-automated and fully-automated plants. As a result of this, quite different job-design problems arise in these workshops compared with the assembly divisions where mainly manual work processes are in operation. Measures for the improvement of working conditions and work structure involve above all the following:

- improvement or removal of physical stress and strain-inducing environmental influences;

- organised alternation on various machines and groups of machines (job rotation);

- transfer of additional tasks to machine operators such as planning of material requirements, machine installation, carrying out tool changes, quality control (job

enlargement, job enrichment);

- special opportunities within the aims set out above exist for the increasing transfer of complex tasks to work teams. For example, responsibility could be delegated for the planning of machine use, for internal work preparation, installation maintenance of machines - often also for identical or similar machines (presses, stamping machines) - and for independent product quality-control. All in all, however, the number of workers affected by work-structuring measures in the manufacturing sector is relatively small for the reasons already mentioned.

The focal point for new forms of job design in the automotive industry is, however, the second of the two above-mentioned areas: assembly. The number of workers involved in assembly activities has been constantly increasing, because of the limited possibility of replacing manpower with other means. The skill and versatility of human hands are still needed to assemble component parts and aggregate units. Fixed-cycle line production is one of the main elements in the endeavour to improve the work situation in assembly activities.

However, the fact is often ignored in public discussion that the percentage of employees working on production lines in the European automotive industry is only about 20% (Renault - 19,8%, Daimler-Benz - 19,2%) and is declining.

During the last 2-3 years, the percentage of fixed-cycle production-line work has declined constantly in favour of modified forms of production-line work or as a result of the change-over to the system of working in smaller autonomous teams and to individual work places.

Unfortunately, in Europe there are no more precise data for industry in general or specifically for the automotive industry. For this reason, one has to turn back to non-European study which provides interesting information from which some conclusions may be drawn.

A statistical survey carried out in the USA in 1968 (2) revealed that the percentage of assembly workers compared with the total number of production workers in manufacturing industries has risen considerably; over a 17 year period, it rose from 34,2% (1950) to 56,9% (1967) (See Fig. 1). Figure 2 shows that, assembly work and production-line manufacture should not be equated. It shows that only 44% of all assembly activities were performed at individual work places, 19% being without extensive division of labour.

The percentage of assembly work performed on the production line is 56%. However, it should be noted that there are again important differences concerning the dependence of the worker on the production-line cycle, since 34% of this line assembly is not fixed-cycle work, and only 22% is. It is mainly towards this latter kind of assembly activity that the efforts to re-organise work structure are being directed with the aim of reducing or abolishing the workers' dependence on the work flow.

With regard to the modification of fixed-cycle production-line manufacture in the automotive (and also the electrical engineering) industry or its discontinuance through a change-over to operation in work teams and individual work places, the following paths of development can be discerned:

1. Shortening of long fixed-cycle assembly lines, or creation of shorter ones - generally synchronised.

2. Easing of work flow on longer assembly lines by forming assembly-line sections with buffer areas.

3. Breaking-up of long assembly-lines into fixed-cycle main assembly lines (preliminary assembly of component parts), which are connected with the main line (by way of buffer areas).

4. Enlargement of job content by combining several tasks at stationary work places.

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(2) Lehmar, M., What's going on in product assembly, in Industrial Engineering 1 (1969), No. 4, pp 41-45.

5. Enlargement of job content by having workers follow the job lot (either on foot or by transport) from work station to work station.

6. Discontinuance of production-line manufacture in favour of the formation of assembly teams.

7. Discontinuance of production-line manufacture in favour of the installation of individual work places.

6. SCOPE AND LIMITS OF WORKERS' MOTIVATION

With the rising level of education and the increase in leisure time in the private life, industrial work is steadily losing its interest and attraction. This is particularly true for young people starting work for the first time.

Assembly work areas, which have so far mainly been designed organisationally on a production-line manufacture basis, are focal points for the use of man-power in the automotive industry. In the leading industrial countries of Continental Europe, 90-95% of the production-line jobs are currently filled by foreign workers - mainly from southern Europe, the Near East and North Africa - among them a large number of women. It is foreseeable, however, that it will become more difficult in future to obtain manpower for simple, repetitive work. The demands put forward by psychologists and sociologists since the 1950s for a change-over from a steadily increasing division of labour in the practice of concentrating different jobs under one individual, of extending the range of tasks, have therefore met with greater acceptance most recently and have been implemented more extensively than ever before. These demands are aimed at providing the workers with a stronger or new motivation - mainly by forming work teams - through work alternation, through extending the range of tasks and through job enrichment. These measures, however, presuppose increased knowledge and capabilities on the part of the worker, together with the individual motivatability of persons with different talents and inclinations.

In experiments made so far or during actual modifications to work organisation, often only about a quarter of the workers were prepared to take intensive training and to take on more complex tasks. A further quarter might be won over by increased publicity to accepting new forms of work organisation, an extension of the range of tasks to be performed and greater responsibility.

On a basis of available experience, it often appears that a number of prerequisites for motivatability are lacking:

- workers from industrially underdeveloped areas and countries, who are becoming involved for the first time in industrial manufacturing process, are at first only suited to taking responsibility for simple activities;

- a lack of command of the language of the host country often constitutes a barrier for many years to taking over skilled jobs, since the ability to communicate is one important condition for assuming responsibility within the framework of autonomous work teams.

However, it is the causes based on the diversity of man and rooted in his inborn talents and inclinations, which determine motivatability. They set limits on motivatability. They set limits on motivation through new job content. In this regard, Singleton (3) distinguishes seven types of man, among which only one or two types correspond to the ideal of the behaviour research specialist: e.g. the seciocentric individual, who believes in common objectives and can be easily motivated in this respect. In the opinion of Hughes and Flowers (4), which is shared by Singleton, the reaction of the individual to job-connected motivation is basically dependent on his own sense of values.

(3) Singleton, W.T., Theoretical Limitations of the Concept of Job Enrichment, Paper presented at the EFPS Conference, 18 May 1974 in Berlin.

(4) Hughes, C.L., and Flowers, V.S., Shaping Personnel Strategies to disparate value systems, in: Personnel, March - April.

On the basis of more recent research, Rühl (5) has differentiated between 'development' types and 'avoidance' types. According to his studies, 75% of unskilled workers belong to the 'avoidance type'. Of this group of people, which is precisely the group under consideration when work structuring measures are being taken, only 27% are motivatable. It follows from the above that limits to motivatability may be encountered in practice, in the very near future.

7. CYCLE TIME AND ITS SIGNIFICANCE FOR JOB SATISFACTION

Within the framework of discussions on the "humanisation" of work, the greatest significance with respect to job satisfaction is often accorded to cycle time.

When dealing with this subject, it should above all be borne in mind that the division of labour had already led to a cycle time of less than one minute at the beginning of the 1930s (6). For this reason, many research workers (mainly English) such as Harding (7) had attempted at that time to investigate the relationships between the scope of the unit work cycle on the one hand and the performance plus job satisfaction on the other. These first research results provided a basis for the further investigations of Cox and Sharp (8) in the early 1950s. The latter wanted to prove the relationships between job satisfaction, cycle time and size of the work task (job-lot size) on the one hand and between satisfaction and performance on the other. Their studies produced the result that enlarging the task did not necessarily lead to a heightened sense of significance, but rather that only more meaningful tasks(completed actions), such as the assembly of a component part for a radio set could bring about increase in job satisfaction. Simply doubling the size of the task, on the other hand, often only means an added burden on the memory and was thus rejected by many workers.

This conclusion was also reached by Vroom and Maier (9) on the basis of later research by Kennedy and O'Neill (10). They too believe that greater diversity only heightens satisfaction in the work if the task represents a unified, integrated and meaningful whole.

The investigations of Wyatt and Marriott (11) were also devoted to studying the relationships between the length of the cycle and satisfaction with the work. In the poll of 82 production-line workers in an English motor works, they attained the following results (cf. also Fig. 3):

Duration of work cycle in minutes	Number of workers involved	Assessment Distribution on a 5 division scale ++	+	0	-	—	Satisfaction index
up to 10 min	17	1	5	8	2	1	0.18
11 to 20 min	20	5	4	4	5	2	0.26
21 to 30 min	21	3	6	8	4	0	0.38
31 to 40 min	18	1	7	9	1	0	0.44
41 to 50 min	6	3	1	2	0	0	1.17

It is clear from the above that the satisfaction index rises slowly but steadily as the duration of the work cycle increases and then jumps suddenly with the transition to a cycle of 41-50 min. Here, however, a peak has probably been reached.

(5) Rühl, G. Paper presented at the 20th Congress of the Gesellschaft für Arbeitswissenschaft 13 March 1974 in Cologne, in: IfaA Mitteilungen No. 50, p 39 et seq.

(6) Friedmann, Georges, Grenzen der Arbeitsteilung, Frankfurt, 1969, p. 6 et seq.

(7) Harding, D.W., A Note of the Subdivision of Assembly Work in: Journal of the National Institute of Industrial Psychology, Jan. 1931, P. 261 et seq.

(8) Cox, D. and Sharp, K.M.D., Research on the Unit of Work, in: Occupational Psychology, April 1951, p. 90 et seq.

(9) Vroom, V.H., and Maier, N.R.F., in: Industrial Social Psychology, Am. Rev. Psych., 1961 12, p. 413-446. (ref. 10 and 11 - see next page)

According to some other studies and on the basis of practical experience, at least the linear trend will probably not continue, because the stress and strain on a worker increase greatly with very complex work. Ulich (12) supposes that there is a U-shaped relationship between complexity criteria and human behaviour criteria (see Fig. 4 in appendix).

Other researchers have studied the connection between cycle time and fluctuation as an indicator of job satisfaction. According to observations made by Baldamus (13) in 22 departments of a plant in the British metal industry, the fluctuation in cycles up to one minute lay between 50 and 70% in cycles from 1 to 10 minutes between 30 and 50%, and in cycles of 10 minutes up to one hour between 20 and 30%. It then fell steadily with larger tasks to about 8 to 10% (fig. 5).

Of the American researchers, Walker and Guest (14) merit close attention for their studies on the reactions of production-line workers in a large American motor works. These showed a high positive correlation between the range of work and the evaluation of the work as "interesting" by the workers employed there. Further, 85% of the workers preferred more varied work tasks. These investigations also demonstrated a significant relationship between increasing division of labour - mainly in very repetitive work - and lost shifts on the one hand and fluctuation on the other. The highest fluctuation figures for all branches of the United States manufacturing industry were to be found for production-line workers in motor works.

Cycle times on the production-lines of the automotive industry have been until now relatively short and the number of assembly jobs is steadily increasing. According to a statistical survey in the USA undertaken in 1968, which has already been mentioned (15), about 56% of the assembly tasks in the manufacturing industry as a whole are performed on assembly lines (cf. Fig. 2). According to the same survey, the cycle times on these lines were the following:

- up to 34% were between 0.1 and 1.0 minutes, and

- up to 21% were between 1.0 and 5.0 minutes

Nonetheless, one should be cautious of applying these figures to the European automotive industry. For example, the average cycle times on the Volkswagen assembly lines are 1.5 minutes whereas they are reported to be about 0.6 minutes in American motor works. This indicates differing degrees of mechanisation as well as differences in company policy.

Moreover, only in extreme cases is the work so extensively sub-divided that each worker performs only one movement in a cycle time of a fraction of a minute. On the Volkswagen production lines, for example, each worker has 6 to 8 work operations to perform. In the other European motor works, as well, tasks mostly require several work operations; in Germany generally 3 to 4 are required.

It appears, moreover, that since about 1969, good progress has been made in the concentration of tasks, thanks to the new trend known as "work structuring". At Volvo, Saab-Scania, Fiat, Daimler-Benz, Renault and Ford, experiments with new forms of work organisation resulted in cycle times of at least 4 to 6 minutes, and in many cases, even of 25 to 30 minutes.

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(10) Kennedy, J.E., and O'Neill, H.E., Job content and worker's opinions, in: J. Appl. Psych., 42, 1958, p. 372-375.

(11) Wyatt, S., and Marriott, R., A study of attitudes to factory work, London, H.M.S.O. 1956.

(12) Ulich, E., Arbeitswechsel und Aufgabenerweiterung, in: REFA-Nach-richten, 25/1972, Volume 4, p. 265 et seq.

(13) Baldamus, W., Type of Work and Motivation, Brit. J. Sociology, 2, 1951, p. 44-48.

(14) Walker, Ch.R., and Guest, R.H., The man on the Assembly Line, Cambridge Mass., 1952, p. 150.

(15) Lehman, M., Loc Cit.

Nowadays, however, it seems more important again to stimulate and intensify research into relationships between cycle times and job satisfaction. More recent studies by Rühl (16) in German Industry have thus shown (thereby confirming earlier findings) that the cycle time seems to be nearly one of several factors which influence job satisfaction. Rühl distinguishes between factors peculiar to the individual, such as age, sex and basic qualification, and those factors determined by the job situation, such as job type, work cycle, and form of work production-line work, team-work, individual work place). It would be important for practicians to give their opinions on these findings.

8. WORK PLACE ALTERNATION: AREAS OF APPLICATION AND EXPERIENCE ACQUIRED

There is a wide range of ways to effect alternation between different jobs and work places. Depending on the actual or desired work forms, the alternation can be organised as follows:

- between individual work places
- within a work team, or
- by including a large number of workers (for example, on a production-line or assembly-line).

Depending on its form such alternation can be either horizontal, i.e. between similar or essential equivalent tasks to achieve simple job enlargement, or vertical with the incorporation of different grades of work, thus being associated with job enrichment.

Finally, the alternation can follow either a prescribed or a self-chosen time and activity sequence.

It is not easy to gain an overall view of the preferred forms of job alternation and the most important areas of application. However, experience already acquired in the automotive industry seems to reveal trends:

- Willingness to alternate work places appears to be less than expected by psychologists and sociologists.

- Job alternation is clearly only more successful in smaller, and therefore easily comprehensible, work teams (of around 4 to 10 workers) in which closer human relationships develop.

- Horizontal work place alternation between similar work places is most effective in promoting understanding for the work of neighbouring colleagues because it offsets one-sided strains provides alternation between monotonous jobs.

Nevertheless this form is not clearly used to any great extent.

- Vertical work place alternation is certainly preferred to horizontal alternation because of the elements of job enrichment it includes, but in complex tasks, it has been shown that some difficult and generally also neuralgic work places (calibration work, hopper work, testing) are avoided or even rejected. When a large number of different tasks are involved, often only a small percentage of the workers are capable of undertaking the difficult or most difficult tasks. Finally, success depends to a large measure on the mental agility of the individuals and of the active members of the team.

- Any form of work place alternation is generally only more favourably received when the diversity of the work done is rewarded by extra pay and the varying difficulty of the different tasks is compensated by promotion to a higher wage group.

- It is noticeable that older workers and women are much less inclined than younger workers and men to alternate work tasks.

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(16) Rühl, G., Untersuchungen zur Arbeitsstrukturierung, in: Industrielle Organisation, Volume 3/1973, p. 147 et seq.

Successful forms of work place alternation have been applied on the scale of entire departments and workshops, mainly in the Lundby and Torslanda Volvo plants, in the engine-assembly department at Saab-Scania and in a number of Renault plants. In the two later cases, they are associated with new forms of work organisation. In all other firms, there are, however, many cases of work place alternation within individual groups which have evidently proved to be successful (Daimler-Benz, Ford). It is noteworthy that alternation is in most cases effected in accordance with a prescribed time and activity sequence and that the form of alternation, once adopted, is generally retained for a considerable period of time.

9. JOB ENLARGEMENT AND JOB ENRICHMENT

The aim of nearly all measures undertaken in big motor companies is the enlargement of work activities horizontally or vertically, the later form taking most aspects of job enrichment into account. Job enrichment can be achieved with the most varied forms of work organisation.

Many cases have occurred recently in which tasks that had so far been performed as production-line work were transferred to individual work places; this was done to encourage the independent manufacture or assembly of a complete component or part of a product (instrument panels, shock obsorbers, etc.). Instead of cycle times of 0.5 to 1.5 minutes, work tasks were created which take from about 4 to 20 minutes to perform and which resulted in exceptional job enrichment (Opel, Ford, Volkswagen, Daimler-Benz).

The same is true for the formation of smaller work teams, with 4 to 10 members. These too are created principally as pre-assembly stations and have often been separated only recently from production-line assembly. Enlargement of the range of work tasks frequently occurs with cycle times from 2.5 to 6 minutes, generally associated with job enrichment elements. Enrichment is achieved mainly when autonomous teams are permitted to divide the work tasks independently among themselves and to alternate between the individual work places. If all team work-places are included in the alternation, the cycle can extend up to 30 minutes (Saab-Scania, Volvo, Renault, Fiat).

With many models of modified production line work as well, however, endeavours are being made to achieve job enlargement at the same time as freer work performance. Examples of this are the cases of modified production-line work at Volvo, Renault and Daimler-Benz, described initially; here, either several stages on the production-line were combined into one work task or the workers on the line followed the task from station to station, thus reaching work cycles of 20 minutes and more.

10. THE FORMATION OF WORK TEAMS

Very diverse aims can be aspired to if work teams are formed. Four purposes can, perhaps, be distinguished:

1. Team formation as a means of promoting co-operation in small groups and of re-establishing or stimulating close inter-personal relations.

2. Formation of work teams as an alternative to production-line work.
   The main interest here lies in abolishing or reducing the workers' dependence on the work flow. It is not absolutely necessary for this to be associated with the enlargement of the scope of activities mentioned in point 3, although this is generally the case.

3. The work team as the preferred alternative for enlarging the scope of the individual's activities, either through work place alternation or job enlargement, associated with the aim of job enrichment.

4. The partly or fully autonomous work team with greater scope for making decisions with a view to determining its own activities. This implies joint consultation, election of a spokesman and/or a team leader, internal work planning, distribution of tasks

among the members of the team, and undertaking quality control.

Under the term "work team", it will be necessary to distinguish between the formation of work teams with very general aims and their association with work structuring measures.

In Scandinavia, the greatest significance is apparently accorded to the formation of teams, and this goes far beyond the sphere of work. It is considered that the team should exercise independent functions, ranging from the exchange of views and information through consultation and discussion to the regulation of relationships with other teams, departments and factories. The elected spokesmen and delegates should in turn, on a second level and with other tasks to fulfil, form consultative and decision-making committees. New operating structures are thus to be formed within which each individual in the group is drawn into the process of opinion-forming and of collective job design and decision-making.

This is the basic idea of the considerations and measures put into practice at Saab-Scania and Volvo following the Norwegian experiments. By the end of 1974, all 3,800 workers in the manufacturing sector of the Saab-Scania factory should be grouped into work teams.

In the framework of such development, the formation of autonomous teams in the final engine-assembly stage has special significance. In this department, for the assembly of the Saab 99, seven work teams have been formed, as an alternative to fixed cycle assembly-line work, each with 3 to 4 workers (total of 42 workers two shifts). A time of only 30 minutes is laid down for the assembly of an engine. The composition of the teams, the work distribution and the arrangement of working time and rest periods are all decided by the workers. Each is free to assemble such an engine alone or in a team of 2 to 5 colleagues. This system steadily puts into practice the high level of team autonomy in the sense of point 4.

At Volvo as well, an extension of team work is being pursued in respects already mentioned. Here, however, the aim of the formation of work teams seems to be mainly to further work place alternation and job enrichment. In this respect, considerable progress has been made both in the lorry-assembly works at Lundby and in the car-assembly plant at Torslanda. Finally, the work team concept is most fully implemented in the new plant workshop for final engine assembly in Skövde and at the car-assembly works in Kalmar.

In central Europe too, team work is becoming increasingly more important, but evidently not in the sense as in Skandinavia, which is characterized by the mentality and ideological conceptions. Here it is conditioned more by consideration of expediency. To this can be added the fact that the formation of teams in Latin countries with a strongly individualistic character - such as France and Italy, for example - seems to be more difficult than in the Germanic countries of the North and thus meets with more resistance. In France and Italy, some interesting examples of team work can be found in the electrical engineering (radio technique) and automotive industries (Fiat, Renault/Choisi-le-Roi), mainly in the formation of assembly islands (isole de montaggio, modules). Finally, there are also numerous examples of team work in the Netherlands and Germany, but here the ideas outlined in points 2 and 4, always play a decisive role.

11. THE COST IN TIME OF TRAINING WORKERS FOR ENLARGED WORK TASKS

Taking over complex work tasks, whether through job enlargement at a stationary work place or in rotation within (partly or fully autonomous) teams presupposes comprehensive training for the workers.

The training time needed for mastering the work operations will increase as a function of job difficulty and the number of tasks involved.

Alternation between similar activities or the enlargement of simple tasks by adding other simple work functions will hardly require additional training and familiarization. In contrast, taking over planning, equipping and control activities and the execution of different manufacturing (welding, grinding, equilibration, tin-plating) or assembly (fitting, soldering, setting, testing) activities presupposes additional skills and familiarization. Arn and Vogel (17) provide a good idea of the time required for training workers at work

(17) Vogel, K., and Arn, E., Die planerischen Voraussetzungen zur Einführung der neuen Arbeitsformen, in: Industrielle Organisation, 43 (1974), No. 1, p. 17 et seq.

places in an engineering works and familiarizing them up to the point where they could achieve average production. The examples considered involved small series production of machines at the firm of Sulzer, Winterthur.

On the basis of their calculations, the two authors have developed the graphs in Fig. 6, which can be understood as described below:

The training period required to master working at a conventional engineering work place (lathe, milling machine, etc.) is fixed at six months. This period corresponds to a factor of I. If, however, a worker is to work in rotation at a normal centre lathe, a duplicating lathe and two turret lathes, the training time necessary to master all these complex tasks is from 18 to 24 months, which corresponds to a factor of 3 to 4. The greatest cost of training in terms of time is incurred for the transfer of difficult tasks to autonomous teams when formal work organisation has been discontinued. In this case, only highly-qualified and comprehensively-trained workers can be put on complicated and high-value machines. They need a training period of about 3 years, which corresponds to a factor of 5. Such time can only be justified if the lengthy and costly training also leads to a long-term commitment on the part of the worker to his work place and to the firm. The use of the skills acquired in this way for the benefit of other work places or firms should not be freely permitted.

Even if the examples found in machine construction cannot be directly extended to the other areas of production in the automotive industry, they do provide an idea of the very diverse time requirements for training workers when various workstructuring measures are being taken.

12. EFFECTS OF MODIFIED WORK FORMS ON THE WORKS MANAGEMENT HIERARCHY

Modifications of work structures have, as is shown by all experience, remarkable effects on the works management staff. When individuals or teams take on tasks which were previously performed by specialists or superiors, then the duties of the latter must of necessity chang as well. New work structures thus compel changes through adaption at all levels of the hierarchy to the new work situations and lead to a new distribution of functions. In many cases the result is also as experiments in the Netherlands, Norway and Denmark have shown - a reduction of higher-level staff.

A few examples may serve to demonstrate this:

- If machine setting is transferred to the competence of individual workers, then the job for which specially trained machine setters were employed disappears.

- If the team assumes responsibility for division of labour, one of the essential tasks of the chargehand and foreman vanishes.

- If the teams are completely autonomous in work organisation, as in Norwegian experiments (e.g. Nobø), then the industrial engineer and the works manager also lose - at least partly - some of their most important functions: work-flow planning, rationalization, deployment of labour, personnel and labour management.

Work planning must then be limited to outline planning and requires accurate harmonization which is also true for the organisation of the production. Consultation and accompanying co-operation stem this arrangement.

On the lower and middle management levels, there is often an impression that work structures make managerial work more difficult. Chairing meetings, convincing people and groups that hold different opinions, writing reports, the long duration of the decision-making process and the co-ordination of groups often with different aims are accompanied by considerable stress. It is principally the roles of the foreman and the work study personnel which need to be redefined. These are precisely the employees who should be kept more informed by the management. In addition, without further training, the lower and middle management level will not be able to cope with the changed work tasks.

13. JOB ENLARGEMENT AND VERSATILITY

When workers are asked what they hope to gain from job restructuring, they generally reply that they also expect material benefits, in addition to increased job satisfaction, in the form of one of the following:

- promotion to a higher wage category;

- additional pay for diversified work;

- a share in the benefits of improved company or workshop results (bonuses, profit sharing);

- modification of individual and direct performance-based remuneration (modified forms of performance remuneration);

- changeover to a status comparable to that of white-collar employees (with monthly wages).

It cannot be denied that these suggestions seem at first sight to be justified. However, it will be necessary to determine in each case whether such suggestions or expectations, are objectively justified:

- if new or additional demands on the worker occur, the work must involve a higher difficulty classification and a correspondingly higher basic rate of pay;

- varied employment through work place alternation or job enlargement will necessitate an evaluation of the scope of the work;

- the basic rate of pay will also be established on a uniform basis for all members of a work team performing the same work tasks through job alternation within the team;

- the type and scope of the performance required from each individual may indicate that new or modified forms of performance based remuneration should be introduced (bonus pay, quota pay) or a changeover made to fixed wage forms (contract wages, monthly wages).

In practice, workers have frequently proved to be disappointed if a change in work tasks did not entail a higher job grading and thus higher pay as well. They were often not prepared to agree to the introduction of new job structures without corresponding concessions. It will therefore be necessary to evaluate previous experience carefully and with reference to examples to study the effects both on job classification and on performance-based remuneration.

It will perhaps be necessary to re-examine some of the job classification systems based on division of labour and to arrive at new methods of remuneration.

14. PERFORMANCE AND REMUNERATION

Modified job structures, by necessity, affect both the collection of data and the setting of job performance targets as well as the method of remuneration - and above all the application of forms of performance-based remuneration. These questions are generally already the focal point of the initial discussion between management and workers concerning intended modifications.

Division of labour is mainly associated with the assignment of task lots to the individual workers. For the component tasks, data (times) are normally determined and prescribed. Basic pay categories are determined and forms of performance-based remuneration are laid down on the basis of job descriptions.

All of this is called into question where job alternation, vertical job enlargement and the formation of autonomous teams are concerned. As soon as an individual task is replaced by a range of tasks, data collection and wage-rate fixing inevitably become more difficult because of the diversity of the tasks concerned. This leads to global data (prescribed times for a component part or a product), more complex programme times (weekly or monthly quotas) and corresponding forms of payment.

These conclusions have so far been the subject of relatively little research and are not at all widely known. This is due to the fact that methods of data collection and remuneration vary from country to country and are difficult to compare. Great difficulty in comprehension also arises as a result of the terminology used in the different languages in the field of data collection, performance and remuneration and the associated diverse wage structures.

15. STANDARDS FOR ASSESSING JOB SATISFACTION AND PRODUCTIVITY, AND THEIR EFFECTIVENESS AS INDICATORS

It is customary to judge the success of work structuring measures by two criteria: first by job satisfaction and secondly by indicators of economic efficiency.

As concerns success with regard to job satisfaction, experience so far has shown that written (questionnaires) or verbal (interviews) polls of workers with simple answers constitute an inadequate means of acquiring usable and, above all, durable evidence. It would seem more necessary to list a scale of characteristics in each poll which explain which type of workers had expressed their satisfaction or dissatisfaction under clearly described conditions.

A good example of this is provided by the investigations of Rühl (18), who included both personal criteria, such as age, sex and level of education, and relevant characteristics, such as type of job, cycle time and form of work, in his methods of operation. It would thus be important to carry out further investigations on these lines, and it would be equally useful if firms that are blazing new trails in job design and work organisation were to come to their own conclusions and record any modification.

It looks even less promising when attempts are made to discover what effects modified job structures have had on economic efficiency. Generally only particulars of fluctuation and absence from work can be found (Saab-Scania, Volvo) as indirect indicators of satisfaction and economic efficiency. In addition, some very informative results have been concerning performances, earnings and productivity following the Norwegian experiments. The clearest evidence so far on questions of economic efficiency is to be found in the reports on the firm Klöckner-Moeller, which has changed over from production-line manufacture to individual work places.

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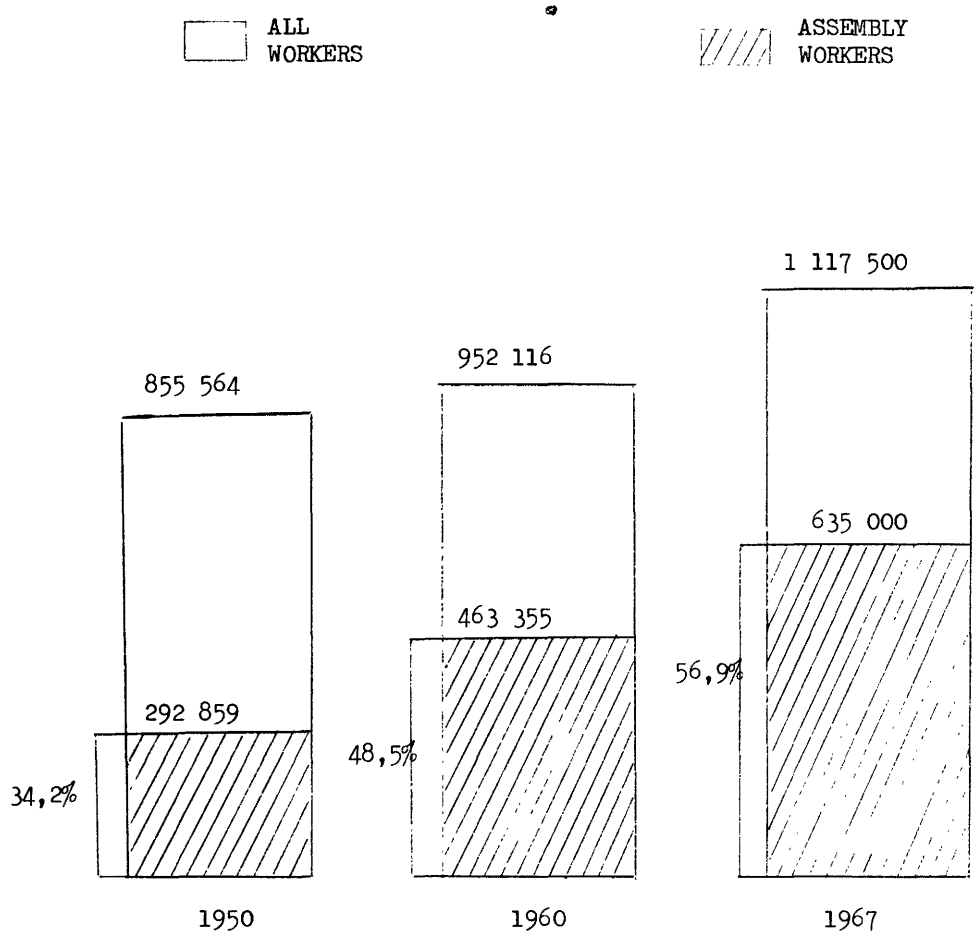
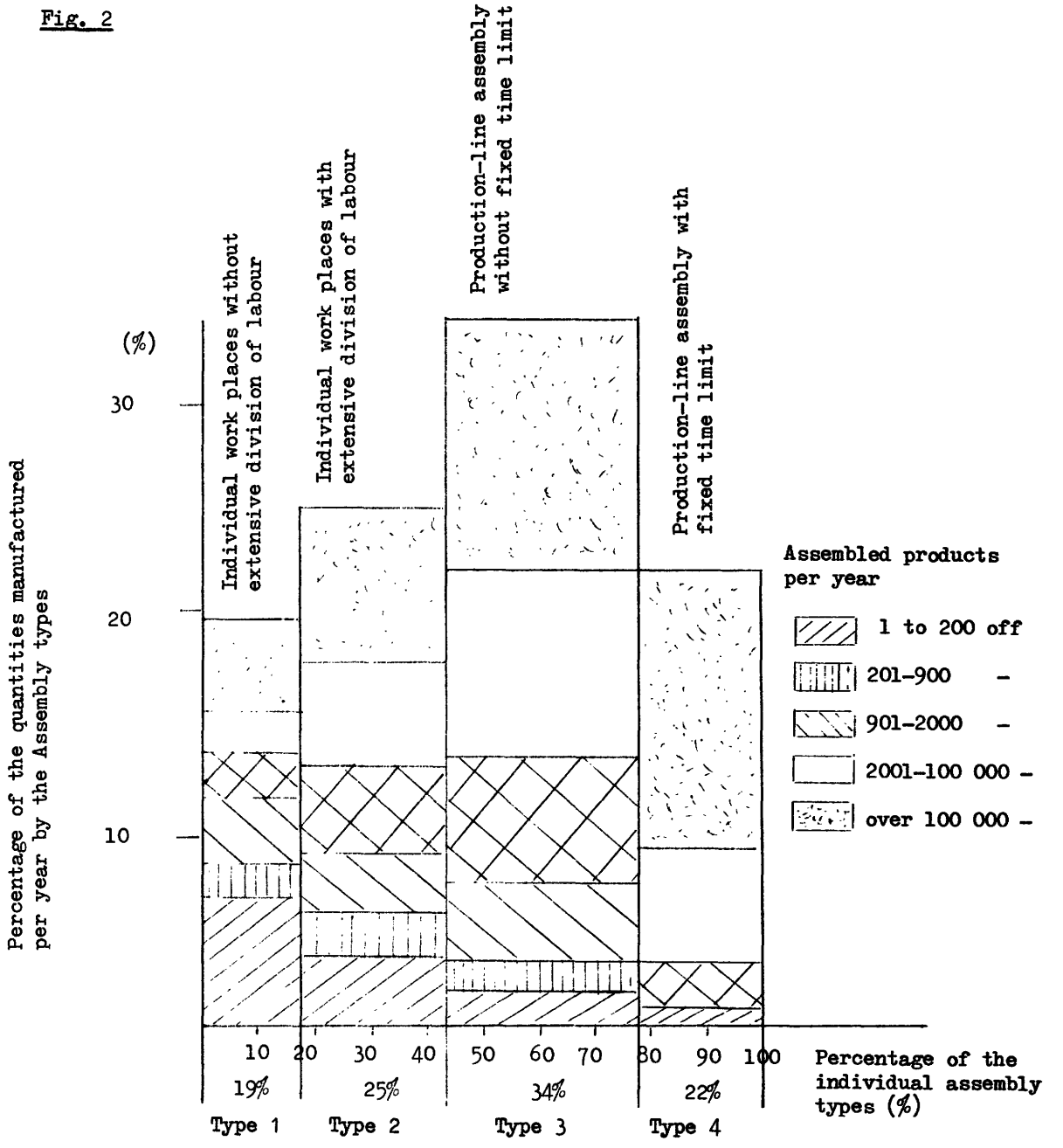
(18) Rühl, G., op cit.

Fig. 1



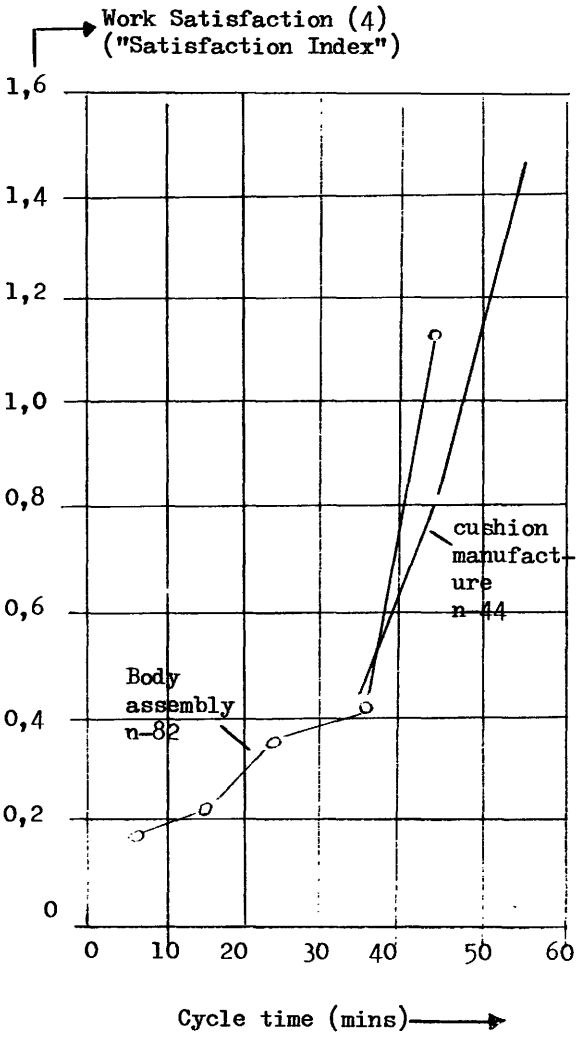
PERCENTAGE OF ASSEMBLY WORKERS OUT OF THE TOTAL NUMBER OF WORKERS IN THE USA MANUFACTURING INDUSTRY

Fig. 2



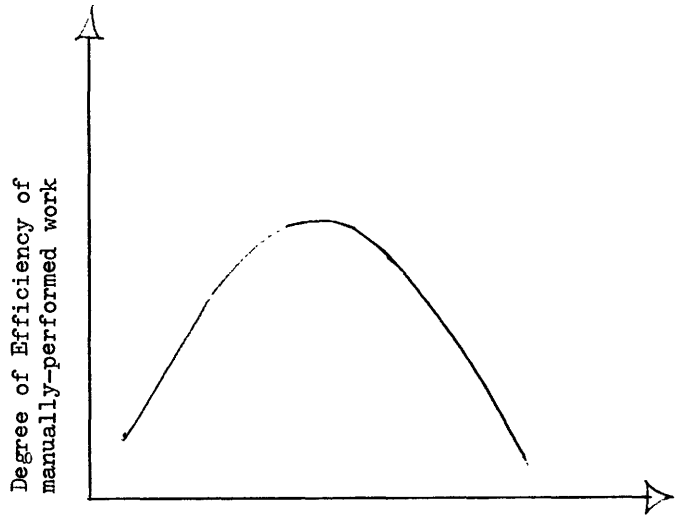
ORGANISATIONAL FORMS OF ASSEMBLY WORK AND THE PERCENTAGE OF THE QUANTITIES MANUFACTURED DURING THE YEAR BY THOSE FORMS

Fig. 3



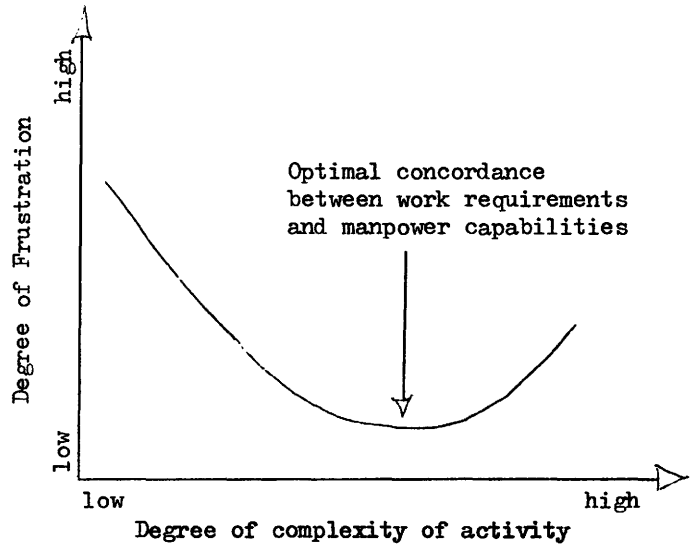
The relationship between the cycle time (2A1) and the "satisfaction index" (4) in two departments of Company B (Wyatt and Marriot, 1956)

Fig. 4



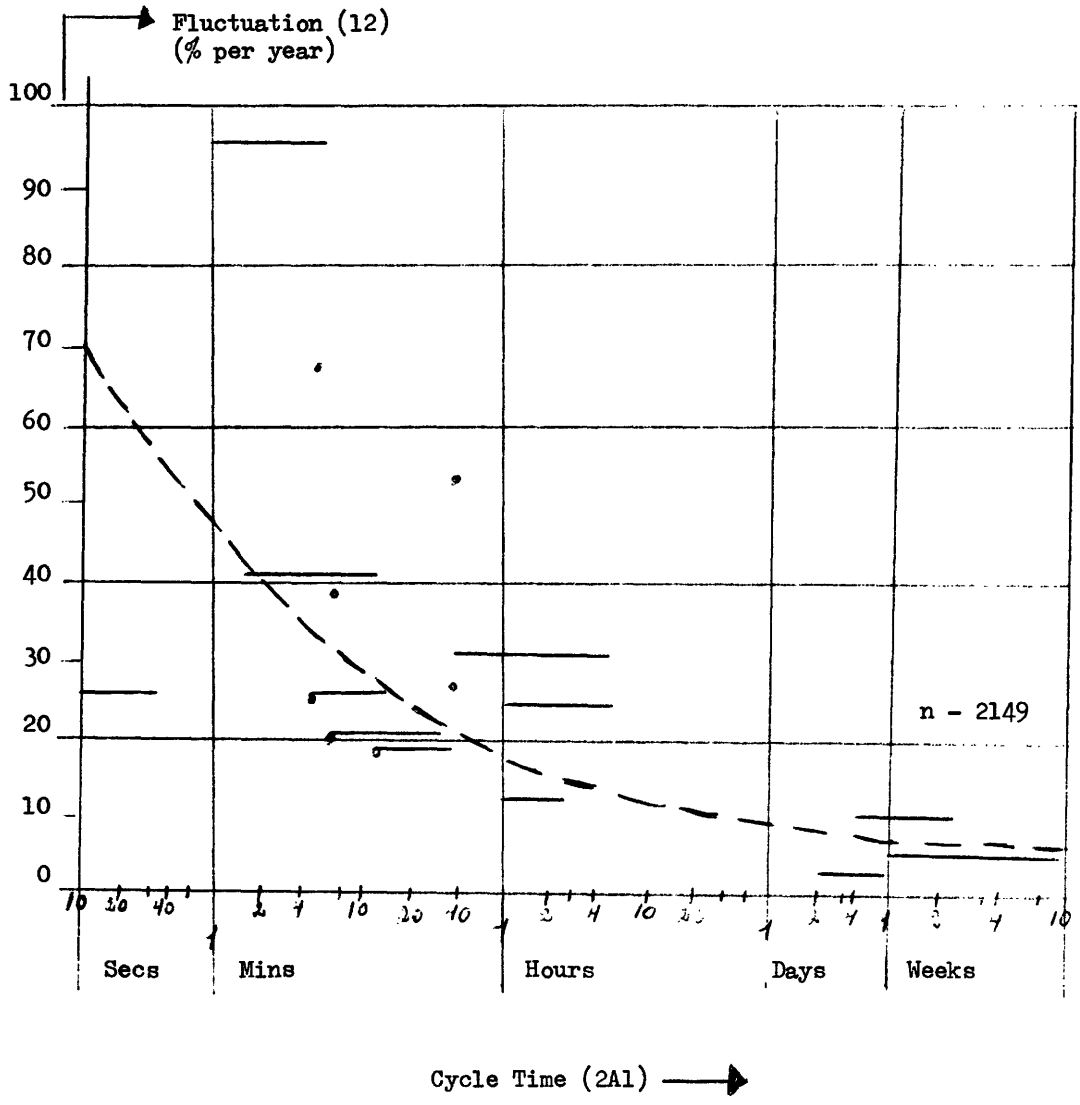
Degree of complexity of activity
= Number of different kinds of activity elements

Supposed relationship between degree of complexity of activity and degree of efficiency of work performed manually (according to Ulich)



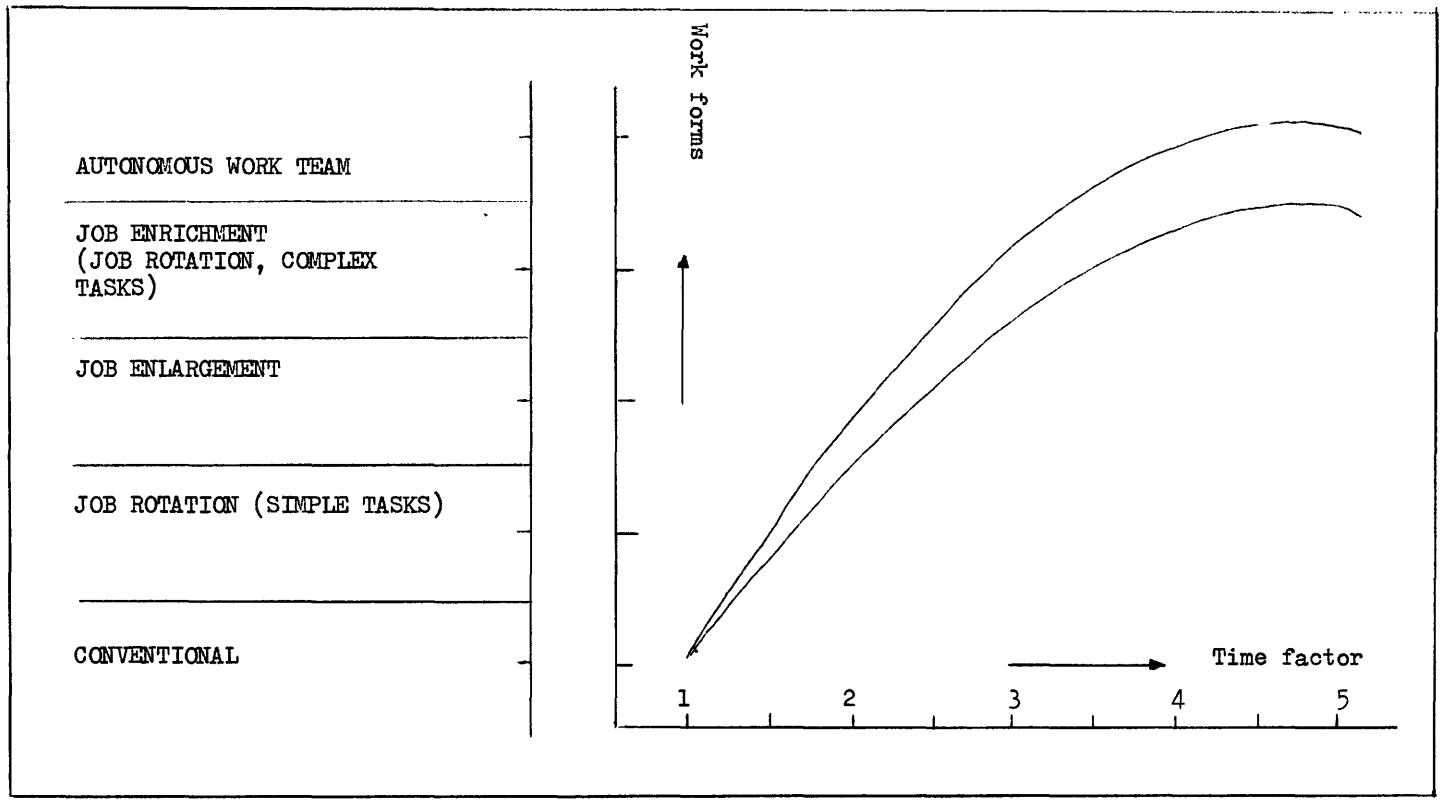
Assumed relationship between degree of frustration and degree of complexity of activity (according to Blum and Naylor, 1968)

Fig. 5



The relationship between cycle time (2A1) and fluctuation (12) in 22 departments of a plant in the British metal processing industry (Baldamus, 1951)

Fig. 6



COST IN TIME FOR TRAINING AND FAMILIARIZATION FOR VARIOUS WORK FORMS

WORKING PAPER FOR GROUP III

METHODS AND ACHIEVEMENTS: "AUTOMATION, INDUSTRIAL ROBOTS, ARTIFICIAL INTELLIGENCE"

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EUROPEAN COMMISSION, BRUSSELS

CONTENTS

1. INTRODUCTION

At the beginning of the century, Scientific Management (SM), or Taylorism, which is now called in question at all levels, replaced the traditional organization in terms of crafts, which was characteristic of old special handicraft skills.

SM is one of the results of the scientific and technological revolution which has brought about a change in the relations between the units of production in industry.

Between technology on one side and job structure on the other no biunivocal relationship exists. Technology must be regarded as one unit in the production system. The balance established between the units comprising this system, which include, inter alia, technology, the labour force, capital, and organization, determines the character of the system at a given moment only. The system itself develops under the pressure of conflicting factors, such as return on capital, and technology.

Any change of one of these factors produces imbalance in the system, which then develops in the direction of a different state of balance.

When any one of the factors undergoes profound change, its impact on the system is then predominant.

Technology, particularly automation, is one major cause of instability. It profoundly affects job structure, by offering a choice between a whole range of possibilities which, in some totally automated factories (the Integrated Manufacturing System), may lead to the elimination of people at the executive level.

It is essential, therefore, to avoid introducing technological processes piecemeal and then trying to adapt the system as well as possible. To proceed in this fashion will invariably bring about more or less prolonged stresses and strains, which may be serious or otherwise, and the resulting balance, again subject to alteration on the next ensuing technological change, would not necessarily be the one most desirable.

On the contrary, it is essential to develop methods of analysis which will lead to better understanding of the effects of technology on the production system as a whole, if the efficiency of that system is to be preserved, i.e., if the profitability of the enterprise is to be maintained and workers' expectations fulfilled.

No such methods at present exist. On a less complicated level, cost/benefit calculations for introducing automation remain doubtful and incomplete. What is involved is actually the broader question of innovation management, this time with the social component added, which, basic as it is, nevertheless is often overlooked.

2. REASONS FOR THE EXPANSION OF AUTOMATION

The industrial climate of this decade will probably be characterized by increasing production costs (wages, energy and raw materials), marginal profits, vigorous competition, sociological and technological changes and monetary instability, with increased government intervention as a result.

In such a climate, industries - at least the most active - will try to automate their production system in order to remain competitive and keep up their profits.

This process has already begun in the large-scale industries, sometimes with the support of the government, as in Japan, which has begun an R&D programme involving an outlay of 100 m u.a. directed towards industrial automation.

The advantages expected from automation, and in particular from computer-assisted automation, are as follows:

(i) A reduction in costs. In factories equipped with NC (numerical control), DNC (direct numerical control, by computer link), or CNC (using control by a mini-computer) machines, manufacturing costs can be reduced by 75% as compared with the costs of conventional manufacturing methods, and a similar reduction can be effected in

machining time as against that in conventional manufacture.

(ii) Improvement of quality and uniformity by elimination of errors and facilitation of rapid-response quality control.

(iii) Adaptation of production to demand. The flexibility of modern automatic systems opens up the prospect of producing made-to-measure goods at mass-production costs.

The rapid changes which are taking place in society are creating imbalances which threaten its operation. In industry there is at present a serious imbalance between the aspirations of workers and the nature of certain forms of work.

This imbalance leads to absenteeism, a rapid turnover of labour or even an inability to recruit new labour. It is well known that in the industrialized nations, and in the Community in particular, many tasks are performed by immigrant workers who as a rule have a low level of training. This situation is worrying both socially and economically, and it is clear that if these tasks cannot be upgraded, it will be necessary to resort to automation. Legislation itself will - very happily - impose automation for dangerous or unhealthy tasks.

However, recent developments in the technology of automation now make it possible to satisfy an increasing proportion of the demand. Technology can meet the needs of the market.

3. TECHNOLOGY

Automation is a multi-disciplinary technology. Its development is due to recent advances in the fields of materials, fluid mechanics, sensors and electronics. Computers occupy a prominent position in this last field. With the introduction of the LSI (large scale integration) technique, minicomputers have attained a sufficiently high performance level and a sufficiently low manufacturing cost to be used as control units on individual machines. Thanks to modular design and to programming, automation, which has traditionally been specific and rigid, is now becoming universal and flexible, thus considerably widening its field of application. It is possible to distinguish several types of application to the production process: manufacturing or machining, handling, assembly and management.

3.1 There are three methods of manufacture, namely:

(i) Continuous manufacture (processing industry) e.g., the refining of oil products, the glass industry, the steel industry or the production of electrical energy. Automation is already used in this type of production and raises no particular problem.

(ii) Mass production using the assembly line technique. The best known example is the car manufacturing industry. Conventional automation, in the form of transfer machines is perfectly suited to this type of production. These machines take advantage of parallelism and simultaneity (piercing and boring the engine block) to work at high speed, and their high cost can be amortized over a large production run. However, the tendency to change vehicle models frequently, or to provide a considerable variety of choices within the same model - such changes being consequences of commercial policy - is causing manufacturers to consider possible automation even in this field. This is true for example of the body-welding line at the Vega factory of General Motors or the Fiat factory at Turin.

(iii) Batch production:
The factory floor is usually divided into functional units containing identical machines (lathes, milling machines, grinding machines, drilling machines and grinding wheels). It will be seen later in the Conference that it is now proposed to form various groups in order to permit work by production group. The pieces to be machined are grouped in technologically similar batches, i.e., batches requiring similar processing stages. The machining "path", the tooling and the settings of the machines have to be modified for each batch.

3.2 Handling includes several operations, storage, transfer and packaging.

Transfer is now effected by conveyors which can be programmed. The transfer and storage operations can now be automated more easily thanks to palletization. Packaging operations - filling, packaging, and labelling are very often automated. One of the major problems which arises in this field and which becomes still more serious in the assembly operations is that of the positioning and orientation of components handling. There are few practical and economic methods of ensuring exact positioning, and orientation during handling. This has to be done at the interface between handling and manufacture or assembly. In order to automate these operations it would probably be necessary to develop container and loader devices making it possible to move components by batches rather than individually.

3.3 Assembly is by far the most complex operation to be carried out by automation. The first problem which arises is that of presenting the units to be assembled. For small, sufficiently strong units there are many sorting and positioning devices, the vibrating bowl and its derivatives being the best known. There are no universal devices for large units. It is here that artificial intelligence may play a part. It is not a question of developing systems endowed with a high level of adaptability, for however interesting these systems may be they will remain in the realm of fundamental and laboratory research, but of equipping devices at the interface with a minimum of sensors and a programme making it possible to correct rather than completely reestablish the orientation and positioning of the units brought by the handling system. A considerable effort must be made to standardize the interface and above all the product. The success of the automation of the assembly process will probably be decided at the product design stage.

3.4 Management: In industrial manufacture it is necessary to collect and process data, to carry out quality control and operating checks, to prepare data for operational reports and for statistics, and to prepare production schedules and operational instructions. These tasks can be assisted or even completely taken over by the central computer, which thus opens the way to the integrated production system in which all operations are performed automatically, and human intervention is required only in planning the overall strategy, design and maintenance of the system. Computer management has moreover penetrated very widely into the services field (banks, insurance and administration).

3.5 Integrated manufacturing system, IMS

A glimpse of the entirely automated factories of the future will make is possible better to grasp the importance of automation for the organization of work. Although no such factories exist at present, the technological basis for their construction already exists and it is certain that these factories will see the light in the near future in certain industrial centres, and that thereafter it will be possible to extend them rapidly to other sectors.

Such a factory will not be managed by a single computer, as a centralized design would not only be extremely vulnerable to machine failures and manufacturing accidents, but would also be very difficult to design and operate, and too rigid to adapt itself to production changes or technological improvements.

It is more likely to take the form of a hierarchical automation of the manufacturing process, comprising at the base machine tools, specialized machines and handling devices. These machines will be equipped with all the electric or electronic units required to enable them to be controlled by electronic automation systems, together with probes making it possible to acquire information at the base. Reflex devices will perform elementary safety and warning operations without the intervention of the central computer. At the next level, each numerical control machine, each conveyor or transfer system, and each robot of the industrial manipulator will receive instructions via a numerical control box or an individual minicomputer.

At the next higher level an industrial computer will manage all the machines, conveyors and robots, retain in its memory the components in course of manufacture, supply to the numerical control boxes or minicomputers at the lower level the programmes appropriate to the components being processed, adapt these programmes to the data provided by the sensors in order to increase the speeds of processing while remaining within the strength limits of the tools, and intervene to detect and identify breakdowns and accidents and to modify the paths followed by the components.

At the upper level will be the central computer whose task will be to assist the human managers of the system. It will help the management to prepare operational programmes to keep

records (products, man-time, machine time, stocks and general book-keeping) and statistics (breakdown, accidents, wear of tools and machines), and will assist the research department in projects and designs and the preparation of processing programs. Industrial robots, which will be described in another report presented at this seminar, will have an important part to play as an interface between the processing and the handling devices. They will be endowed with the minimum artificial intelligence required to enable them to position and orientate pieces accurately.

The normal trend will be a gradual advance of automation from the lower to the higher levels, each level and each unit being tried and developed separately. It is clear that in a factory of this kind the type and characteristics of the tasks will be very different from those in existing factories.

4. CONDITIONS FOR EXPANSION

The expansion of automation is an accomplished fact; it is the method of expansion which still remains uncertain. Numerical control machines appeared on the market in 1955, but 15 years were required for technicians to become familiar with the application of such devices. It is possible to identify three conditions for the expansion of automation - the market, technology and staff training. We will examine the staff training problems in a later chapter.

4.1 The market: The most important market is that of the small- and medium-sized undertakings. It is necessary to provide detailed information and training for heads of undertakings in order to familiarize them with the possibilities offered by automation.

A considerable effort must be made to standardize hardware and software. This will certainly be impeded by a proliferation of incompatible types of equipment. Here a governmental effort will be necessary, unless a firm such as IBM is to dominate the field and acquire a monopoly position on the market. IBM has already done so in the software field with the COPICS system for the acquisition of manufacturing data and processing and management instructions, and perhaps in the hardware field with system 24 which foreshadows the automatic integrated factory. Manufacturers will have to provide an after-sales service comparable to those in the car or computer industries. No industrialist will consent to see his production stopped for days by a system failure because no breakdown service is to hand. Lastly, methods of purchasing or hiring must be worked out to permit the financing of investment.

4.2 Technology: The technology is so far developed that the main efforts required are in the direction of refinement, strength, serviceability and simplicity.

As we have seen above, a special effort must be made to standardize software and hardware. One of the weak areas of fully automatic systems is still the detection and identification of accidents, and remedial action. Men are still needed here. Such work is interesting and calls for highly-skilled personnel when the accident is exceptional, but is monotonous and psychologically exhausting when it is a routine matter such as the breakage of components.

5. ECONOMIC PROBLEMS

Automation permits improvements in speed, efficiency, quality and homogeneity of production.

Speed: Automation makes it possible to obtain the maximum output from machines without exceeding their limits of tolerance. This is true, for example, of adaptative numerical control machines. This is the name given to a numerical control machine tool in which the speeds of rotation of the boring spindles and the feed rates of the component are determined by the programme on the basis of data supplied by torque, vibration and temperature sensors. Under manual control, the operator always hesitates to approach the maximum permissible speeds, and consequently adaptative systems improve productivity by about 50% as compared with manual systems without reducing the lifetime of the tool.

Where controls are influenced by several parameters, a man can scarcely take account simultaneously of more than one or two parameters, whereas the machine can react simultaneously and in the optimum manner to all the parameters. This applies for example to multiaxial

machines.

Lastly, because of its regular functioning, a machine with a peak speed equal to or even less than that of a man has a higher average speed than the man. This is true, for example, of industrial robots.

Efficiency: The computer is the chief factor in ensuring the optimization and hence the maximum yield of the system. In batch production the configuration and trajectories of the components must be modified for each batch. As a result the equipment remains idle for a great deal of the time, sometimes as much as 90%. The computer makes it possible to reduce these waiting times. Another advantage of automation is the reduction of the delay in obtaining components, thus permitting a reduction in stocks. It is thus possible to economize on material used. In the painting or varnishing of components by Tralfa robots, for example, savings of up to 40% in varnish have been recorded.

Quality and homogeneity: Homogeneity of production is essential in most forms of continuous production such as the manufacture of chemical products or the production of electricity, or the manufacture of special equipment such as waveguides, thin layers and integrated circuits. Automation also permits immediate correction of errors, and considerably reduced manufacturing losses.

Models for the cost/benefit calculation on automation are now appearing. These models take many factors into consideration, including investment, interest, versatility, utilization factor, duration, speed, etc.

6. IMPLICATIONS IN RESPECT OF WORKING CONDITIONS

Automation can no longer be considered nowadays as a method of improving production at isolated points in the process. Such a concept would inevitably lead to the under-employment of expensive equipment, and entail economic penalties since there would always be competitors who understood and exploited the equipment's potential. Under-employment of computers is a well-known example of faulty strategy.

It is the entire production system which has to be reexamined, when a company decides to automate its manufacturing processes.

The process of introducing automation will of course be operated in stages, but as part of a well-defined plan. It is a dynamic process which is being launched, and its goal should be more satisfactory working conditions and increased profitability for the company.

One of the main obstacles encountered here is market structure.

The product: The best way of looking at automation is to begin by defining the product, and how it can be adapted to the automated production process. Choice of materials, design of components and, to some extent, the appearance and performance of products, must be fitted to the process itself. The major obstacle is that the end characteristics are largely determined by customers' requirements. Buyers dominate the market not producers. The rise in the price of raw materials and energy, and the need to introduce counter-pollution measures, and control inflation, may reverse this trend. Nevertheless, the deciding factors will be quality and price. Automation is inconceivable unless it leads to a better product at lower prices. Clearly this aim has little chance of being achieved by automation at isolated points in the production process.

Decentralization: One important change in working conditions is the decentralization which flexible automation allows. Concentration into huge production units is in fact dictated by the need to make expensive equipment pay. On the social plane, this type of concentration is one of the factors leading to dehumanization, first because it demands that families be transferred to industrialized regions, and then in that it increases commuter distances, and turns the workers into an amorphous mass, with no definite social structure. The difficulties which have arisen in such concentrations, recruitment problems, and the need to resort to importing foreign labour, on a large scale, are the motivating factors in the move to re-humanize work. Increasingly, however, large companies are tending to sub-contract the manufacture of items least adapted to improving working conditions, and thus to transfer to small- and medium-sized undertakings the social problems connected with the said conditions.

The fact that the means of action available to unions in the small- and medium-sized undertakings are more restricted, means that the serious nature of the problem is obscured for the moment.

Flexible automation on the other hand allows small batches to be manufactured together. In the case of small- and medium-sized undertakings the advantage of automation also lies in flexibility, rather than return. This flexibility makes it possible for subcontract work to be recovered and with it, a type of organization maintaining full employment of manpower and plant.

The computer: The computer is the other technological factor promoting decentralization. The process control computer is already an essential component in automation. The central computer allows a communications network to be set up, an indispensable corrolary to decentralization. Whereas the process control computer operates only on machines, the central computer or, to be more exact the management computer, affects both man and machine, and permits of a symbiosis between these two types of data-processing, which results in an integrated informatics system. This informatics system will have very considerable and far-reaching effects on employment. It is no longer possible for instance to accept an encoder service between management and the manufacturing process. The response time is too long. Communication should be direct meaning that personnel at the lower end of the hierarchy, i.e., at shop floor level, should have direct access to the information system. This penetration of information processing to shop floor level in the form of terminals, video screens, typewriters, etc., will become most important in the next few years, once integrated circuits, which are still assembled manually in the Far East, are assembled automatically, thus leading to a significant reduction in the cost of data-processing equipment.

A direct result of this introduction of data-processing to shop floor level will be to reduce the importance of intermediary skills which, in turn, will lead to a radical change of atmosphere. Unless workers are not trained in time to use these new techniques, they will tend to regard the equipment as a foreign body, and the rejection phenomenon will then occur, which will be damaging both to company profits and the social climate.

Divorce between man and machine: The transfer of physical functions and decisions to the machine, appears to be a good way to define the role of automation. By decision we mean the choice between several programmed alternatives, which may range from simple "start stop" decisions, up to more complex choices but, in the last analysis, are always routine choices. Automation makes it possible to break the man-machine coupling, a particularly dehumanized aspect of work, and to link him instead with the production process. As a result of automation, man should be able to detach himself from his work. In the case of partial automation, particularly degenerate work forms are found, in which, for example, the worker serves an industrial robot used to feed a press, simply because a man is the best machine for the realigning and positioning of components presented at random. And yet it is easy to avoid such degradation, without introducing sophisticated techniques, by making provision for buffer zones. What is surprising is that it is still possible to advertise such jobs and to have them accepted.

This example show that technology does not always simply mean improvement in working conditions, unless improvement be included from the start as one of the problems for solving. Once machines carry out all the routine physical and intellectual tasks, then man can concentrate on more creative tasks such as research, programming, development, modifications and providing emergency and maintenance services for the system.

In his book "Civilisation at the Crossroads", the Czechoslovak sociologist, Radovan Richta, anticipates that with the new technology, the number of industrial workers employed in fifteen to twenty years time will constitute only 20% of the work force. This will include an extremely large proportion of engineers, repair and maintenance mechanics and workers; the proportion of operatives, which at present still represents over 80% of workers, falling to some few per cent only.

By then, the fully integrated automatic factories (IMS), of which there are a few examples in Japan and Eastern Germany, will present even more radical characteristics, since there will be hardly any men involved at all, at production level. The increasingly higher qualifications of staff and the adaptability of the machines, should lead to a situation whereby, in the production process, man is regarded as a constant and the machine as a variable, a situation which is obviously more satisfying from a human point of view than the one at present.

Management and highly-qualified staff now have jobs that are less dependent on fluctuations in the economy than is the case with operatives.

With the coming of automation and the raising of the level of qualifications, this stability should gradually spread to all personnel.

Democratization: One feature of business life, already, is the fact that staff are seeking greater participation at all levels. The raising of the level of qualifications, which should result from the introduction of technology, will strengthen this tendency. Participation in decision making will probably be one of the most important demands on the part of labour. This type of organization already exists in a large number of enterprises, particularly in the large Japanese undertakings. It would seem that the success of these companies cannot be explained simply by the advanced technology they use, but also depends on the social climate which management has been able to establish.

7. TRAINING PROBLEMS

The role of vocational training is to train workers amongst others, in the use of technology.

It is doubtful whether traditional schooling, with its passivity and inability to respond quickly to developments can assume this role. Yet traditional teaching remains essential. It should dispense versatile knowledge, and train workers in the acquisition of the rudiments they will require in their working lives. A certain amount of retraining to bring basic knowledge up to date will have to be provided by this teaching.

Permanent (continuing) education, on the other hand, is much better adapted to the needs of workers and should become the rule. Alternating periods of study and work could even lead to a particularly innovative form of education, i.e., continuous reeducation. This would enable the errors of extending the school age to be corrected, since it is becoming less and less suited to the needs of a growing number of young people. It would allow the idea of a continuous career, with periodic texts of one's knowledge to take the place of the all-or-nothing attitude characteristic of the present system.

8. CONCLUSION

The production process has to be considered as a system. Technology is one element in this system.

Automation represents a profound technological change and an absolute economic necessity in certain sectors of industry if the companies in these sectors are to maintain their competitive positions. Under this economic pressure, companies will be forced to change their production processes and these changes will have a reaction throughout the entire system, and especially on working conditions. A new balance will have to be attained in order to reduce and dissipate the stresses and strains generated by these changes.

The new job structure resulting could be very much more satisfactory than the previous one. Potentially, automation could raise the qualifications required of workers, and therefore increase job interest. It makes possible elimination of dangerous and dirty jobs, as well as of many monotonous ones.

But these developments will not take place of their own accord. They will be the result of negotiations between both sides of industry, against a background of economic pressures and necessities. Conflicts and tensions may be avoided or mitigated to a large extent if the whole system, and not just the isolated factor of technology, be first subjected to analysis.

Any action which aims to place technology at the service of man should begin by:

(i) gathering more information as to the demands and the possibilities of automation;

(ii) disseminating generally the results of experiments already made;

(iii) making a thorough study of the production system as a whole, and of its sub-systems and the interaction between them.

REPORT NO I OF WORKING GROUP III

METHODS AND ACHIEVEMENTS: "EUROPEAN AUTOMOTIVE INDUSTRY" AND "AUTOMATION, INDUSTRIAL ROBOTS AND ARTIFICIAL INTELLIGENCE"

PRESENTED BY MR. V. RAIEVSKI,
HONARY DIRECTOR GENERAL OF THE
EUROPEAN COMMISSION, BRUSSELS

In view of the fact that the Chairman of this Working Party, Mr. Delamotte, has had to leave this morning, I have been asked to present his conclusions which have, of course, been discussed with the WP which were mainly drawn up by the Chairman, Dr. Weil and myself after the meeting.

It should perhaps be pointed out that owing to the composition of the Working Parties these conclusions and recommendations more particularly reflect the opinion of heads of undertakings. I think that this point should be noted. We first examined the reasons which are driving the undertakings to reorganize their production processes. We then examined the way in which the changes were made and finally we arrived at a certain number of recommendations for future Commission actions. As regards the origins of these changes, the factors driving these undertakings to take such action appear to be different, but in fact they stem from a common root; the traditional methods of work organization which spring from the scientific organization of work and consist in the rationalization of tasks, reach their limits in most undertakings. Productivity can no longer be increased or even maintained which, in a number of cases, results in the problem of the undertaking's survival. Other means must, therefore, be found. In this connection, the WP participants pointed out that the traditional work organization is not sacred: there was no scientific proof or evidence that this organization was the best.

The new solutions which must be found can no longer be restrictive. This, of course, was first considered not only undesirable but impossible at the present time. Such solutions necessarily involve staff consultation and participation. As regards planning, it was acknowledged that a partial solution to this problem, a sort of replastering, is hardly likely to improve the situation. There must be a global approach. The production apparatus must be considered as a system where all the elements are linked and highly interdependent. What does this mean in practice? It means that for a solution to be satisfactory, action should be taken in respect of production process technology and the work structure. This, however, involved the problems of vocational classification, promotion procedures, wage structures, staff training in short, all the problems of staff management. It also means a revision of the information methods and decision-making procedures within the undertaking. Lastly, it can not be restricted to the executive level since most of the hierarchical grades are concerned. In order to effect such changes, the plans can of course differ in their implementation; they may comprise states which depend on established priorities; they may or may not comprise a certain number of aspects, e.g., pilot experiments.

We then examined the type of recommendations which could be made to the Commission. It was noted that the terms of reference for legislative action in this field were insufficient. It is, therefore, in the sectors of communication, information and development of methodological instruments that Commission action should be given priority. In respect of communication, we felt that perhaps the first thing to do would be to compile a glossary of terms used - a modest project, but one which was considered extremely useful since we noted that in our own WP, the meaning of words translated in exactly the same way was in fact very different. As regards information, there are a number of possibilities. On is organization: we feel it is important to carry out an examination and a comparison, (the latter being more than an examination) of the programmes and methods used by national bodies, e.g., the Agence Nationale pour l'amélioration des conditions de travail in France, the organisation responsible for the action programme on the humanization of work in Germany, the Job Satisfaction Committee of the Ministry of Labour in the United Kingdom, and other organizations. We could also compare the methods used by each industrial sector on the lines of the type of seminar on the motor vehicle industry held here in September. As regards the methodology, or the development of a working instrument, one instrument seems essential: one which enables undertakings to compare the characteristics of their jobs with those in the industries of the same sector. A study group or working party should, therefore, be set up to establish an analysis structure and define the methods of assessing or measuring these characteristics or indicators of jobs or tasks. The indicators would of course include data on the physical and chemical environment, noise, temperature, draughts, etc. and on the physical or mental loads, wage problems, vocational categories, level of responsibilities, level of training required etc. Plus information on the effects or the performance of the undertaking comprising, for example, data on turnover, absenteeism, quality, waste levels, etc. Lastly, another methodological instrument or approach considered of interest concerned the analysis of experiments. It may, of course, be of value to encourage experiments, but the WP felt that it was more important to have common terms of reference so that the results of experiments could be compared. This could be done by defining the type of information required, the fields in which these experiments were carried out and whether an experiment can in fact be defined. A single action in the field of environment, for instance, is a major step, yet in itself it is not the definition of an

experiment, but simply a stage in the experiment. Consequently, a very exact definition must be obtained of the field in which these experiments are undertaken, their role in the overall plan, the type of data to be collected, the composition of the Working Parties responsible for analyses and the type of indicator used. These are the recommendations made by this Working Party.

REPORT NO II OF WORKING GROUP III

METHODS AND ACHIEVEMENTS:

"EUROPEAN AUTOMOTIVE INDUSTRY"

PRESENTED BY MR. R. WEIL, DIRECTOR OF

THE INSTITUT FÜR ANGEWANDTE ARBEITS-

WISSENSCHAFT E.V., COLOGNE

I. PRINCIPLES

1. The Working Party considers that the problems can only be dealt with satisfactorily if the overall objectives of a change in labour relationships between the individual - the undertaking - society - the economy are determined and a strategy is developed to promote this development.

2. The production process must be regarded as a complex one, which can only be considered from the point of view of its multiple effects on the management of undertakings, the hierarchical structures, job organization, job definition and workers' advancement. Only thus do the technical and organizational solutions acquire their full significance in relation to problems of management and use of staff in the interest of work structuring. Here, too, it is important that the individual measure or solution in a particular undertaking should not be regarded in isolation but within the context of its overall effects. In so doing the following should be taken particularly into account:
   - the situation in specific countries and firms (receptiveness to change);
   - industrial relationships with regard to style of management and participation in its many forms;
   - the effects of measures at all levels within the firm;
   - the traditional methods of industrial management theory.

3. As regards the question of which measures should be given priority, no agreement can be reached because of the differing origin of participants. However, no-one can deny that the best possible combination of widely varying measures at different levels promises the greatest success.

II. RECOMMENDATIONS TO THE COMMISSION

In accordance with these principles the Commission should gradually develop schemes in various areas and at different levels, mainly:

1. The recording and dissemination of experience and schemes already available in Europe. This includes:
   - a description of the programmes of various governments to promote the humanization of working conditions (e.g. in the United Kingdom, France, Germany and Sweden);
   - a study of work done by other bodies and organizations, in particular the employers' associations and the trade unions;
   - an analysis of leading firms' experience in this field.

2. The Commission should improve opportunities for communication, i.e. should encourage interested parties to meet more frequently to exchange information and experience at courses and conferences.

3. The Commission should facilitate understanding between people with differing languages and attitudes by promoting the production of a glossary.

4. The Commission could make a useful contribution to all future projects if it were to draw up an inventory of aids on the basis of all available experience. This task should comprise:
   - the fixing of criteria;
   - the drawing-up of definitions of standards;
   - the recording of indicators;
   - the recording and description of objective ergonomic measuring methods;
   - the establishment of a model for job description and analysis;
   - the distribution of examples for the formation of teams in the undertakings for the

purposes of an interdisciplinary approach to problems.

The Working Party considers that this preliminary work must be carried out first of all before attempts can be made, in a later stage of development, to determine how far the Commission of the European Communities can coordinate the work of national governments or institutions, and how much need there is for additional studies and surveys at Community level. This recommendation is based on the consideration that duplication of work should be avoided and that, at Community level, it is more important to encourage and coordinate joint developments than to initiate individual research projects.

NOTE

As regards the inventory mentioned under 4 the Working Party considers that a good basis for work in this direction is to be found in the Renault company's set of criteria and graduated measures which was developed by Mr Lucas and carried on by Mr Fantoli.

As regards the catalogue of orientation data and criteria the Working Party is thinking along the lines of the proposals drawn up by Messrs Jönsson (Volvo) and Tynan (BLMC).

The Working Party considers that rapid progress could be made if the Commission were to establish a working party consisting of four or five members who might be able to draw up appropriate proposals in one day.

WORKING PAPER FOR GROUP IV

"FINANCIAL AND ECONOMIC ASPECTS OF JOB ENRICHMENT SYSTEMS"

PRESENTED BY PROFESSOR DR. W. ALBEDA,
STICHTING BEDRIJFSKUNDE, DELFT

1. INTRODUCTION

Work structuring was defined by a working group within the Philips company at the end of 1963 as follows: "organizing work, the working situation and working conditions in such a way that, while preserving or improving output, the jobs correspond as much as possible to the capacities and ambitions of employees".

"While preserving or improving output". The wording is interesting. It implies that a higher output is not the object of work structuring. Output must not of course suffer from it. If possible it should be improved, but that is not really what it is about. Later on in the brochure from which this definition is taken, reference is made to a "remarkable one-sidedness in designing work structuring experiments".... "Either it is considered sufficient to make some output calculations in accordance with standard procedures, or mention is only made of social aspects, whether measured or not."

In a report presented in November 1973 by a work structuring committee set up by the Central Works Council of N.V. Philips the following remark is encountered:

"We have found that work structuring is regarded as a 'luxury article'. This probably explains the fact that even the technical and economic advantages of work structuring receive so little attention", and later: "if it comes to the pinch, economies are made in many areas, including work structuring".

If one looks at the literature on work structuring one is struck by the great amount of emphasis placed on the socio-psychological aspects. One senses a certain hesitation about going any further than this. What is behind this hesitation? Perhaps it might be said that many people are convinced that if the subject were to be approached from the financial and economic side, it would be bound to have an extremely negative effect on the results. Work structuring aims at giving people more meaningful work, at interesting them more in their work, thereby improving their integration within the company. If one were to insist that it should also make money, the whole atmosphere would be spoilt right from the beginning. In my efforts to interest firms in this project I heard this view expressed more than once.

2. SOME POSSIBLE ELEMENTS

In a widely quoted article [1] it is stated on the basis of the results of an opinion poll that the attainment in business and industry of a high level of productivity and quality is seen as primarily a technical matter pursuing certain aims:

a. The content of individual jobs is specified by:
   - specialization in training such that:
     - training requirements are minimal,
     - learning time and training time are minimal,
     - a full-day's task is created in such a way that:
       the worker feels satisfaction (without any criteria for job satisfaction);
     - account is taken of workshop organization or trade union rules.

b. Individual tasks are combined to form jobs in such a way that:
   - job specialization is achieved by limiting the number of tasks in the job and limiting the variation in tasks of one function;
   - the job consists of the maximum number of repetitive actions;
   - the training time is minimal.

This line of thinking fits into the sphere of scientific business management. It limits the dependence of the organization upon the individual, but also the individual's contribution to the organization. The assumption is that skilled labour is scarce, and labour costs are determined by the level of the wages paid. Any firm introducing work structuring systems in such a climate, without grasping the underlying presuppositions, will in fact be permitting itself the "luxury" of one-sided socio-psychologically motivated experiments.

The obvious one-sidedness of this line of thinking can be illustrated by looking at the costs involved in narrowing the scope of a job (job simplification) [2].

a. Job simplification entails higher costs connected with:

1) the quality of the work, quality control;
2) supervision [3];
3) labour stability.

1) If everyone is made responsible for only a very small part of the work, no-one can be made responsible for the work as a whole. In nearly all reports of experiments in job enlargement it is pointed out that the quality of the work improved while quality control entailed less time and expense.

2) Closely bound up with the first point is the decrease in the need for supervision. The increasing fragmentation of work into small elements removes from it in any case the element of "self reliance or independent judgment". There is then no latitude for individual judgment concerning a change in the work arising from unforeseen circumstances (changes in the quality of the raw material, breakdowns in operation, etc.) which an employee with any power to use his own discretion would be able to cope with quite easily. Furthermore, in short-cycle work any changes resulting from changes in management policy call for detailed decisions from the supervisory personnel.

3) Stability. In so far as work structuring systems cause employees to become more involved in their work, the alienation effect is reduced and there will be less absenteeism and less labour turnover. The costs involved here are not easy to estimate.

b. Scoville also mentions the following less tangible cost effects:

Effects on capital costs. Experience gives no clear information on this point. The machinery and equipment of a factory is based on a particular division of labour. Whether work structuring systems are introduced with or without any change of capital investment makes quite a difference.

Flexibility. Over-specialized employees cannot easily be switched to different jobs if it should suddenly become necessary for one reason or another.

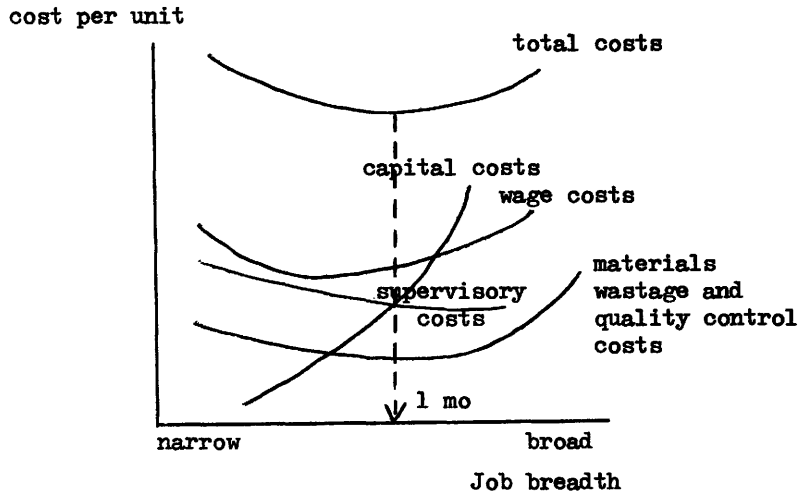
Labour relations and workshop management. Here again, there is no clear effect. Where there is greater job satisfaction (less alienation) there will be fewer labour conflicts. The employee will become interested in other aspects of the work and not simply in the wage he receives for doing it. Where there is extreme division of labour the wage is the only variable in which people are interested [4]. On the other hand, assembly line workers are easily replaceable. Where there is a plentiful supply of labour this gives the management a strong position of superiority.

Summarizing, we arrive at the following cost elements:

- capital costs; wage costs; costs of training employees; supervisory costs; quality control costs; costs of rejects and scrap; costs involved in preserving reasonable labour relations and workshop management.

Scoville gives a graph in which he plots costs per unit against job breadth:

Graph 2.1



A graph of this type could also, of course, be drawn up from the point of view of employees.

3. ENVIRONMENTAL INFLUENCES

The situation as presented in the above graph obviously depends to a great extent on factors dictated by the system of labour relations in society as a whole, in the individual branch of industry and in the individual firm. We shall now consider these influences in turn.

3.1 Labour market

The situation on the labour market has a decisive influence, both direct and indirect, on the costs involved in the introduction of work structuring systems. Prominent among the direct influences from the labour market is of course the scarcity situation. The most important question here is the relative and absolute availability of unskilled labour. The introduction of short-cycle work is a consequence of the reaction of employers to the traditional situation of a shortage of skilled labour and an excess supply of unskilled labour.

If a decrease in the availability of unskilled labour (arising from the development of the "educated society") makes it increasingly difficult to man the assembly lines, a situation arises in which employers are compelled either to give very high wages and better terms of employment to assembly line workers or to make the work attractive to others than unskilled labour by job enlargement and similar measures. Of course, this is partly a question of costs and partly one of availability, pure and simple.

Of course, a surplus of unskilled workers, forced to take any job they can get, also operates in the other direction. The management is under no obligation to revise its assumptions, and will often be inclined to maintain the situation in the form that became familiar in the 'thirties'. There will be all the more cause to do so if there is a plentiful supply of immigrant labour, mostly unskilled. Employers will not be so very keen on giving foreign labour more than a minimal training or more than a minimal learning time. Immigrants in our society are temporary figures. Sooner or later they may be gone again. There does not seem much sense in spending much time and money on their vocational training. Added to this is the fact that the immigrants, given their position, are more interested in the money they can earn by working than in the content of their work.

Nevertheless it is possible that the extra costs involved in the employment of immigrants – a high rate of labour turnover, translation problems, social welfare worries, housing, etc. –

may still sway the balance towards the introduction of work structuring systems in order to make the work continuously interesting to indigenous labour. An employer may, therefore, wish to introduce work structuring systems in order to reduce his dependence upon immigrant labour. He will then set off the extra costs possibly involved by the work structuring against the extra costs involved in employing immigrant labour.

3.2 Wage costs

For the individual firm the proportion between unskilled and skilled labour is generally dictated by the labour market and by collective labour agreements. It may be assumed that where there are marked differences in remuneration there will be little stimulus to introduce work structuring systems. Low wages for unskilled labour can easily compensate the higher costs of supervision, quality control, etc., or at least create the impression that these costs are being compensated.

3.3 Costs of training and learning time

For the purposes of costing it is important to the employer to know whether he must bear the costs of the training and induction of an employee or whether they will be borne by the employee himself. Trade unions generally want to see these costs charged in full to the employer. They will seldom be entirely successful in this. Nevertheless, specific training on the job, which is largely provided in the work structuring systems, is as a rule a charge upon the employer.

3.4 Attitude of the trade union

It is clearly very difficult to introduce work structuring systems if the attitude of the trade union or unions is negative. The successful introduction of such systems depends to a great extent on trade union cooperation. It may, therefore, be useful for employees and trade unions to make a closer analysis of the costs and benefits of work structuring systems (see section 4).

4. THE COSTS QUESTION FROM THE POINT OF VIEW OF THE TRADE UNIONS

Trade unions are accustomed to negotiating. This implies that they have considerable experience of acting in situations that have the character of "distributive bargaining", in other words where the one party has to win and the other to lose. In return for meeting wage demands the trade union gives the guarantee that it will not upset the work situation.

The introduction of work structuring systems is of a different nature. It may be assumed that a somewhat higher remuneration will be paid for a job of greater breadth. If the trade union participates at workshop level there are two questions that it will want an answer to: how broad is the job and what is the financial remuneration? It will also be interested in the consequences of possibly higher labour productivity for the overall employment situation. I shall not deal here with the fundamental questions facing the trade unions in this problem area. I shall mention them only in passing.

- Will the participation of trade unions (for example through shop stewards) lead to a more or less permanent dialogue between company management and trade union, and if so, can the trade union enter into such a relationship without alienating its members?

- Can a trade union maintain intensive and permanent consultation with management at the same time as with its own members?

- Does the trade union seek a different relationship with management than one of opposition and resistance?

The employee is far less inclined than the employer to make a careful calculation of the costs involved for him in the introduction of work structuring systems. In the first place the employee is not so commercially minded as the employer (although the situation can be quite different in an extreme division of labour).

In the second place, and this is far more fundamental, the employee is confronted with two aspects of his work. Work is firstly a way of earning a living, but secondly it is also a

matter of personal, intrinsic value for the worker. A change in job content is, therefore, at the same time a change involving aspects of financial and psychological costs and returns.

From the point of view of the employee one might draw up the following statement of costs and benefits.

Table 4.1

Costs	Benefits
- Extra effort	- Higher wage
- Costs of education or training (where borne by the employee)	- Greater personal satisfaction from the job - Greater employability due to broader training
- Stronger ties with the firm (not so easy to find work elsewhere)	- Stronger ties with the firm (not so soon out of a job)
- Chance of unemployment following higher productivity	

The same costs and benefits also hold as far as the trade unions are concerned, plus the fact that closer communication with the management has two aspects, on the costs side implying less freedom in the event of conflict, and on the benefits side implying more influence on management policy.

I have included some effects under both "costs" and "benefits" because it is not always entirely clear whether an effect is to be evaluated as positive or negative. Some effects have a negative as well as a positive aspect.

5. COSTS OF WORK STRUCTURING AND ORGANIZATION OF THE FIRM

In the introduction I referred to the hesitation often noticed when it is a question of trying to learn more about the financial aspects of work structuring systems. This hesitation is bound up with the suspicion of employees, who see work structuring systems as simply a means of enabling the firm to earn more, which, therefore, makes them less interested in such systems.

The economic motive is inseparable from a business enterprise. It motivates management policy more than any other considerations. Any management policy not basing itself expressly on the economic motive would, therefore, inevitably be in a weak position in relation to other forms of management policy. It would acquire a "luxury" character. It is that part of overall policy that is the first to be jettisoned if losses are threatened.

In short, in an environment like that of the modern business enterprise any part of operating policy is at a disadvantage if it cannot be legitimated by the motive of efficiency. This is all the more regrettable in that a well designed work structuring system is not only a manner of organizing work differently but should also have implications for the organization of the firm as a whole and for the overall policy of the enterprise.

The starting premise of work structuring is that excessive narrowness of job content leads to employee alienation. But the same line of thought can lead to acceptance of the notion of "interlocking tasks", "job rotation" or physical nearness to others, and the creation of working groups based on cooperation and mutual assistance.

Einar Thorsrud [5] points out that it is particularly when individual tasks make no perceptible and tangible contribution to the end product that such groups ought to be formed. These groups should receive instruction in the organization of the work, and consequently in job

design, and one might add even in the design of a product. They ought to have some control over "boundary tasks". Thorsrud also advocates that the group should have a say in the appointment of its leaders. In this way the acceptance of work structuring systems evolves into much more fundamental restructuring within the organization. Obviously, there is an important element of truth in the straightforward social arguments for such an evolution, since it is after all a question of adapting the organization to newer social insights. But there is no point in denying that this matter also has an important financial and economic aspect. The statement "Job enrichment pays off" [6] admittedly betrays a somewhat one-sided approach. It must be realized, however, that the economic arguments (which do not exclude the social ones) strengthen the position of work structuring systems within the firm, and can thus contribute to the penetration of the underlying ideas into the organization of the firm. It is, therefore, desirable that the translation of this development into hard financial and economic facts should leave its mark on the enterprise as a whole.

6. METHODS OF DETERMINING THE COSTS

The problems discussed in the previous section can also be formulated to the effect that a search must be made for methods of bringing out the value of the human organization of the firm. In recent years this has become the subject of "Human Resources Accounting" (H.R.A.).

In principle there are two ways in which the calculations can be made:

- firstly by calculating the costs involved in the introduction and alteration of the human organization;

- secondly by estimating the returns from changes in the organization.

The drawback of the first method is that all costs are calculated as necessary outlay, which, from the economic point of view, obviously entails presupposing what should ultimately be gained.

Devising a system of calculating the returns of the human organization is of the utmost significance for the future of the organization. Although much has been written on the subject in recent decades, I am not aware of any satisfactory methods of calculation.

Various studies have appeared in which efforts are made to arrive at a system of "Human Resources Accounting". The most promising method so far seems to be the one that proceeds from the idea that expenditure on human resources should be seen as an investment in people and in organization. Likert, in particular, has attempted to measure what he terms "intervening variables", such as group loyalty, skill, motivation and the capacity to operate as a group, decision-making, and so on [7].

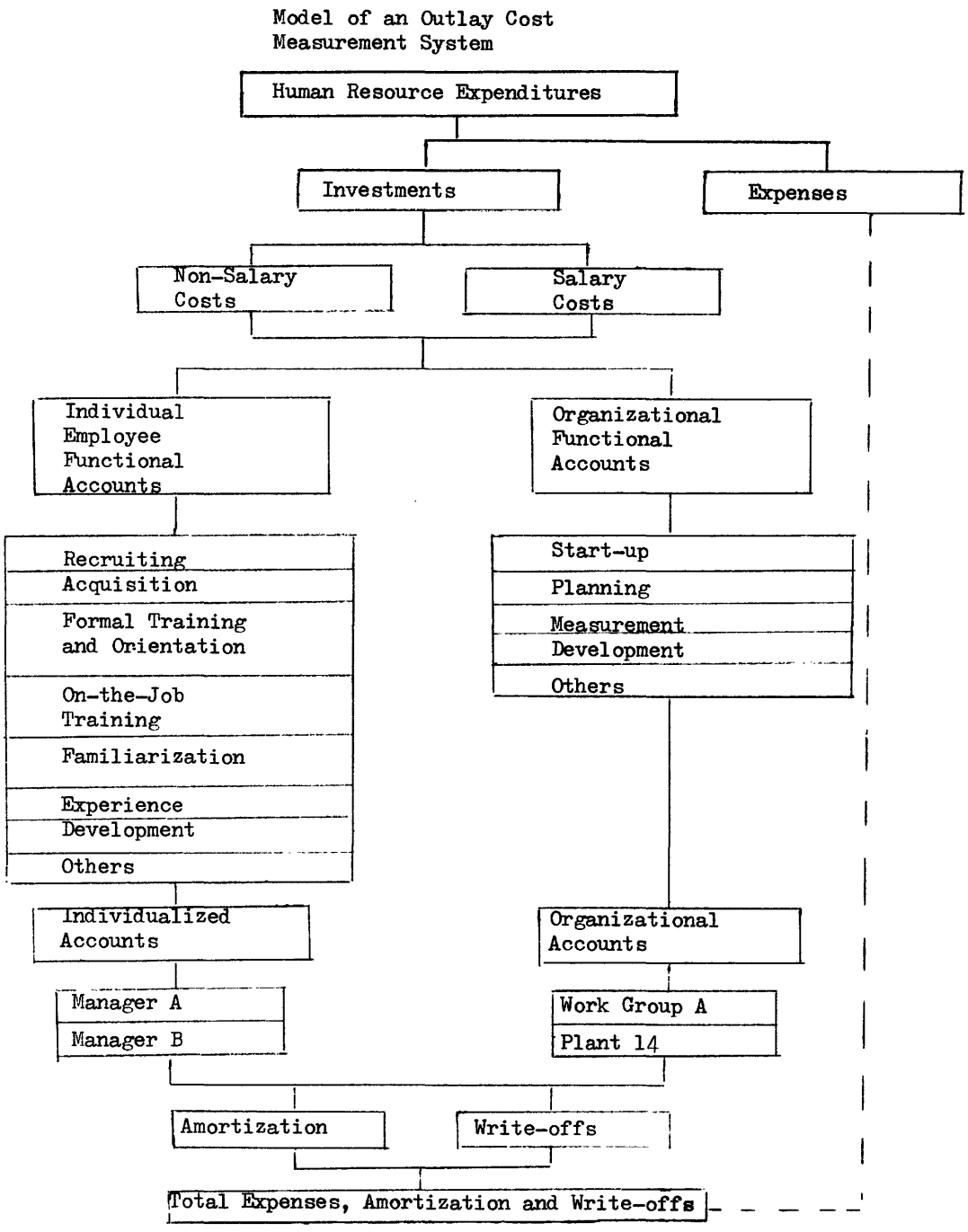
In the attached scheme three authors, Brummet, Pyle and Flamholtz, give a survey of all the elements involved[8] (Figure 6.1).

The model concerns expenditures related to individual persons, groups or organizations. Since people work no longer with the firm than up to the age of retirement, if they do not leave earlier, a distinction can be made between the maximum life of an investment (in, for example, the recruiting, formal training and orientation of employees) and the actual life. Maximum life is of course a clearly distinguishable concept. However, it is far less relevant than the expected life of the investment, since this is something that must be estimated on the basis of experience. It is evident that greater job satisfaction is capable of lengthening the expected life of the investment.

Investment in human resources may be distinguished from investment in the organization. These comprise the costs that are incurred over and above the costs attributable to all the persons separately in an organization. Every organization has "start-up costs", and during the start-up period a low productivity. Whereas the investments in individuals (training, starting salary, etc.) only keep their value until all persons forming the group (the department, the team etc.) have left the firm, the investments in the organization continue to yield their return.

We have already referred in the foregoing to the danger of calculating only on the basis of historic cost. Hence the attempts made in such systems to measure the replacement value of

Fig. 6.1



From: Human Resource Accounting in Industry /41

these investments. The R.G. Barry Corporation discussed in the above-mentioned article made calculations of what it would cost to replace each of its managers. With regard to the investment in organizations it is also taken into account that some outlay costs made in the past would not be repeated in the event of a complete restructuring of the organization. On the other hand there are costs in a new organization that are not or will not be needed in the existing one. What are referred to as "positional replacement costs" may be lower, equal to or greater than the historic cost of the existing investments.

This method of human resources accounting has been developed in particular with a view to tying up with normal business accounting. By calculating the investment in employees and organization it is hoped to be able to make better calculations of the efficiency of the enterprise as a whole. The question here is whether the same system can be used to calculate the economic profitability of work structuring systems? The categories of costs involved in such systems have already been indicated in the foregoing. They are not only concerned with "human costs". We have seen that the consumption of materials, capital costs and quality control play a part in the calculation of the returns from work structuring systems. On the costs side it is largely but not exclusively a question of the outlay on specific categories or individual persons, although of course material investments (for other workshop layouts, machine replacements if the assembly line disappears etc.) are also involved.

With this indication it can be stated that good Human Resources Accounting can make it better possible to calculate both the costs and the benefits of work structuring systems. In the earlier mentioned study by Banner and Baker the question is asked whether reasonable accounting of "human assets" will not in the first place be extremely expensive in most cases, and in the second place whether the psychological value of such intangible matters as "job satisfaction", the feeling of togetherness, etc. can have any independent significance, as distinct from their possible economic impact. They fear that, through Human Resources Accounting, experiments of this kind will become unduly coupled to the profit motive. This warning is a fair one. It may be a good thing to make in addition to the economic calculation a socio-psychological evaluation, more especially if the enterprise wishes to include in its total package of objects other aims than purely economic ones. More and more companies appear to wish to do so. It would be shortsighted, however, if the economic calculation were then to be neglected. Profit must not be the only object of a firm, but it remains the prerequisite for its continuance and growth.

1) Davis, Canter & Hoffman, Current Job Design Criteria in Design of Jobs, ed. Louis E. Davis and James C. Taylor, Penguin 1972

2) James C. Scoville, Aspects of jobs and training, in bovenvermelde bundel

3) zie: Louis E. Davis and Eric L. Trist, Improving the quality of work life. A background paper, commissioned by H.E.W. for a report on work in America, June 1972

4) Guest and Walker, The men on the Assembly Line, Harvard University Press, 1952

5) Job design in the wider context, in Davis and Taylor, Design of Jobs, Penguin books 1972

6) In Davis and Taylor a.w. pag. 245

7) See David Banner and Geoffrey Baker "Human Resource Accounting", A critical view in: MSU Business Topics vol. 21, no. 4/1973

8) Human Resource Accounting in Industry, Personnel Administration, July/August 1969

REPORT OF WORKING GROUP IV

"FINANCIAL AND ECONOMIC ASPECTS OF JOB ENRICHMENT SYSTEMS"

PRESENTED BY PROFESSOR DR. W. ALBEDA,
STICHTING BEDRIJFSKUNDE, DELFT

The policies that we discussed during this conference cannot and should not be reduced to technicalities or to gimmicks to make a little more profit by letting people work in a different way. These policies are concerned with the humanisation of work and work organisation. This statement contains the basic problem of our working group, the working group that discussed economic, financial, and management aspects.

A first question: Why do employers engage in such policies? The working group mentioned a large range of motivations that can be brought under two main headings. In the first place the employer has the feeling that it is forced upon him by circumstances over which he has no control. A few examples, there are new shortages in the labour market, the changing structure and changing motivation of the labour force - we get more and more people with university degrees but less unskilled workers and as consequence unemployed highly qualified people and at the same time the necessity to import migrant workers. Should that be the result or should employers try to organise a new type of hierarchy a sort of flattened hierarchy. Another example, changes in the organisation of society, of governments, we have the possibility of Trade Union pressure. Often employers have to work into this direction under alarming labour turnover, an alarming growth of absenteeism and so on. In short, there is a new factoral situation and the employer has the feeling that he must react.

In the second place there is the possibility that the introduction of new methods is the outcome of a strategy motivated by real or imagined possibilities. There is growing influence of developments in the behavioural sciences. Employers think that by introducing changes they may improve the motivation of the workers and thereby use their human resources in a better way. They may feel that their organisation is too static. It should be organised in such a way that everybody is learning every day especially given a changing and even turbulent environment. In this connection we had a very interesting discussion of the Trist/Emery model. There may be the necessity to change organisation as a consequence of technological change because there are always unanticipated consequences of technology.

There is also the possibility to look upon this matter not from the point of view of the employer but so from the point of view of society as a whole. The way employers organise the work may have consequences for society as a whole. To mention a few points, the total production in society, the use that society makes of available capital, the call that unemployed workers may make upon social funds, the influence on welfare and so on, and perhaps one could mention that if we do not find a better organisation of work and better content of work, then possibly the survival of our economic system as such could be brought into discussion.

If I give a good impression of the discussion, I think that most of the people in the working group had a feeling that in most cases it is a crisis situation that is leading managements to action. The crisis situation is more common than the well reasoned strategy and of course it was pointed out that in cases where you react to a crisis situation there is always the danger that managements are busy resolving yesterday's problems instead of thinking about the problems of tomorrow.

Before speaking of economic calculation, one has to know who it is who is going to make the calculation. There are some possible views. In the first place there is management because management has the responsibility for the organisation of the firm. But there are other possible views. It could be management who consults his personnel through the existing channels of the firm. It was stated also that especially these matters should be decided by means of workers participation in its many forms - in the form of works councils, autonomous work groups, mitbestimmung (we had quite a discussion on mitbestimmung). Attention was drawn to cases where trade unions are making the demands that such change should be part of their bargaining and it was pointed out also that bargaining in some cases was performed in an unusual setting - that bargaining was going on nowadays in some supervisory boards.

There is also the possibility that the state could demand from the employers that they change their work organisation. Lastly, there was the remark that it would be a danger if management itself was not really involved in changes in work organisation and advisors as a consequence could use a ready made system that could be used for all enterprises and the remark was made that there were many cultures even in one country - every enterprise in a certain sense has its own culture.

It is clear that calculation will be made in a different way by the different groups concerned. But then two questions may be put forward. In the first place: Does a company who engages in such a policy make a calculation? and in the second place: is it possible to make

a calculation of costs and benefits? I got the following impression from the discussion.

In the first place such a calculation of costs and possible benefits are very seldom made and then the danger is put forward, does it not mean that such experiments get a more or less luxury character. Everything within an enterprise is calculated on its effects on profits. What will happen if there is an important scheme in a firm that is not calculated in that way and is there not a danger that such outlays should be scrapped at the moment when emergencies arise?

In the second place, such calculations are extremely difficult, both the costs and results are difficult to measure, and in general in crisis situations one does not always calculate.

In the third place, what kind of calculation do we really mean? Is it the sort of calculation that leads to price fixing or should it rather be a calculation based upon the objectives of the scheme? But how do you measure the value of a more innovative organisation? One can, of course, measure the costs of absenteeism or of labour turnover and take into account the different costs of labour turnover for different rates of work. One can evaluate the cost of labour unrest, of resistance to change some workers, and also the cost to society of employment, but such a calculation done afterwards may reveal many quite unexpected results and I am inclined to think of the famous experiences of the Hawthorne group.

Even unsuccessful experiments may show unexpected possibilities of people in a new organisational setting. There may also be unexpected costs. Very important seems to be the change for middle and lower managements. Autonomous working groups may take over the part of their jobs. Perhaps new possibilities because of the need for specialists will arise for those people but many of the people concerned had limited education and they are often older than 50 years. Much stress was put by different speakers on this problem for lower managements. It is also possible that the preparation of organisational change may reveal that the situation within the firm differs already strongly from the former structure as it was put on paper. Workers often had more influence on the actual organisation of work than is implied in the organisational schemes - in other words communication downwards and upwards in the organisation is often very poor. People do not always tell what they know. Management does not always tell what it wants.

Another organisation may lead to other wage systems or the introduction of a new wage system may lead to a new organisation. In short, calculation before the act is difficult and after the act only partially possible. Also the way of calculation was discussed. One speaker thought that management often would decide rather easily with regard to a large amount of money for the top of the organisation and would shrink away from smaller outlays for experiences at the workshop level. Importance of such work at the grass roots was stressed from different sides. One could say that there is influence upwards from work content, to groups, to supervisor, to the management structure, and then to hierarchical structures of the firm as a whole, and so often what is called structuring could be the top of an iceberg.

We also tried to discuss the possible role of the State and of course of the European Community. It is possible to devise state policies to stimulate such schemes. Several proposals were put forward within the group but, of course, we did not take them to the note. In the first place, a proposal to obligate enterprises bigger than a certain number of workers to publish a social account.

In the second place, systems of tax exemptions for outlays on such schemes or experiments were discussed. There is a proposed Swedish example where firms have to contribute out of their profits to an investment fund. If bodies for joint decision making within the firm so decide, they can put proposals before the Labour Market Boards to use their funds for social schemes.

A third proposal, rapid harmonisation of such type of investment. In the Swedish legislation there is also the possibility to impose planning for five years upon every firm.

A fourth proposal, subsidising research and experiments by the Government.

A fifth one, setting up bodies for research and assistance to firms in this connection.

I think that on the whole we had a good and stimulating discussion that asked for some form of follow up.

WORKING PAPER FOR GROUP V

"PROBLEMS OF EDUCATION AND TRAINING"

PRESENTED BY MR. J. DELORS, PROFESSOR AT
L'UNIVERSITE DE PARIS IX - DAUPHINE ET
L'ECOLE NATIONALE DE L'ADMINISTRATION

INTRODUCTION

Any change in our social structure requires, in order to be successful, a prior and then a simultaneous effort at training all those people involved in this process of change. An effort which will ensure that the people concerned have a positive attitude in relation to new horizons and are able to take advantage of opportunities offered to them.

This is the case when it comes to the changes which require improvements in working conditions. Experiments already tried and difficulties encountered seem to confirm the importance of training as a factor which will ensure success.

For this reason the present report is devoted to the relationship between a training policy and work policy.

The term 'work policy' may seem somewhat surprising. It seems, however, that it can be justified by the extent of the ground covered. In fact, in order truly to change the conditions of men at work, action has to be taken on several fronts:

- Allow workers, as a result of voluntary and organised moves, to vary their professional experiences and in so doing make concrete use of all their abilities;

- Offer them, as a result of greater flexibility, an actual degree of choice in arranging their time at work during a day, a year, or in fact throughout their working lives;

- Improve the working environment - first and foremost by improving hygiene and safety regulations;

- Change the organisation and the content of a job of work: broaden the scope of tasks to be carried out, make the job more interesting, set up independent shifts;

- Alter the relationships with those in charge, bearing in mind the aims of the younger generation in particular to create better personal relationships based on a policy of exchanging functions;

- Designate authority at all levels, in such a way as to encourage the initiative and creative ability of the largest number of people.

Insofar as the training policy is concerned, it should first be examined for what it is. To what degree can it expect to favour progress towards an improvement of the conditions of the man at work ?

In this connection, much has been made of the new-fangled aspects of continuous education, which is basically aimed at all the working population, irrespective of age. Hence the question which is asked in the first section of this report: Is continuous education really the answer to this lofty ambition which may revolutionise everything we associate with life at work, and in fact with life in general ?

What is more, it will become increasingly difficult to think about continuous education without at the same time wondering about the education system as a whole. The connections between the two speak for themselves. The second part of the report is devoted to such questions.

Conceived on entirely new lines, the policy of education is liable in this way to set the wheels in motion for an improvement in working conditions. Positive factors abound. It is therefore important - and this is the aim of the third section - to assess the exact scope of any training policy, without under-estimating the risk of stagnation and the risk of reproducing an already existing standard pattern.

Insofar as working conditions are concerned, a policy of change reveals the need for training and an attempt to analyse this in Section four.

SECTION ONE

CONTINUOUS EDUCATION - A LOFTY AMBITION

In its broadest and most ambitious sense, continous education has three basic and essential aims:

- freedom to decide on change
- evening out of opportunities
- cultural development.

These aims will not be accomplished without some effort.

Their success does not only depend on the overall concept of such a policy, but rather on the legal, financial and educational machinery brought into play.

Freedom to decide on change

It has perhaps become somewhat trite these days to say that the age in which we live is characterised by the speed at which change occurs and affects our lives in the fields of science and technology and also in the fields of philosophy and education ..... not to mention the relatively frequent changes which occur and affect our lifestyle and basis for existence.

Now, we all know that change upsets and disturbs people - even discourages them. Continuous training should help the person concerned to arrive at an attitude and state of mind which will give him self-confidence and make him the master of his own destiny. It is not merely a question of updating one's knowledge, it involves an awareness of innovations and an acceptance of their existence.

These considerations hold good, first and foremost, for one's professional career and for all things related to it: the loss of a job and the consequent need for retraining, a change in the content of a job or work which requires adapting to new 'methods of operation', progress and development on the economic, financial or technical front and a consequent need to bring oneself up to date. Continuous training should enable the worker to face up to the new situation with which he is confronted, from both the psychological and technical point of view.

The same applies in the case of 'voluntary moves'. The worker who wished to change his job has, in most cases, to undergo continuous training.

From this it may be concluded that an efficient functioning of the labour market, permitting the adaptations, changes and moves which are necessary or desired, can only be conceived if it operates in close conjunction with a system of continuous training, offering extensive facilities to all workers, either when a disturbing event occurs, or when the people concerned wish to anticipate change by preparing themselves for it in advance. This is why representatives of wage-earners attach great importance to the acknowledgement and organisation of a right to continuous training. For this reason some Members of the European Economic Community have brought into force legislation granting this right and defining the means by which it can be imposed.

The creation of a right, either by law or by contractual agreement does not entirely solve the matter. A further requirement is that the system which is introduced should efficiently cater for the need imposed by the development of a particular job. It is vital that adjustments be made both within a particular firm and within the labour market as a whole. From this point of view it would seem that the continuous training system has not yet achieved the desired level of flexibility and variety.

Evening out of opportunities

This aim can be very succinctly put: to offer to any worker who so desires, a second or even a third chance to be able to realise his ambitions insofar as his professional career is concerned.

Continuous training is the answer for all those people who have not given up hope and who want to make up for the handicaps they have suffered as a result of their birth, family background or merely bad luck.

Hence the importance of what we know as job promotion which brings with it the opportunity to train at a higher level and consequently step up one or several rungs in the qualifications ladder. This system of promotion has existed for some time, and over the last twenty-five years has meant that our economies have been able to meet the need for qualified staff by means of training adults who are already well-established in their professional careers - a need which could not be met by young school-leavers and university graduates alone. The system has also given additional opportunities to those who wish to better themselves in their work.

A more systematic organisation of the continuous education system would no doubt increase these opportunities for job promotion. However, the limits of such progress would very soon become obvious if certain conditions were not fulfilled.

At the forefront of these conditions is the need for a greater flexibility in the criteria for staff recruitment. In those countries where a certificate is everything, it would no doubt be necessary to provide some sort of certificate of continuous education. Otherwise, those people who have undergone continuous training would doubtless experience great difficulty in getting their newly-acquired abilities recognised by employers. On the other hand, it would be dangerous to be too free with the granting of certificates, as one would then run the risk of giving an exaggeratedly utilitarian character to the policy of continuous training.

Another and more basic condition, which is more difficult to fulfill, is flexibility in one's working life. It is only too obvious that in order to progress further along the road towards evening out of opportunities, the possibility has to be taken into account that during one's professional career one may more successively 'up' and 'down'. If this is not the case, in the end, when there are no vacancies, there will not be sufficient actual opportunities for those people who, thanks to continuous training, have the ability to take on more highly-qualified jobs. One can see only too clearly the political and sociological ideals which stand in the way of bringing about a more just and equal society.

Cultural development

Up until now, the professional aspect of continuous education has purposely been stressed, possibly because of the overriding concern which surrounds working conditions. However, this should not result in any limitation of the ambitions of a continuous education policy.

The prospects are in fact much wider: to make a man capable of a greater self-sufficiency, more able to understand the world in which he lives and in which he must act as a productive unit, certainly, but also as a citzen and a man with family and social responsibilities.

However, the world today is unwilling to circumscribe and to take control. It is characterised by an overlapping complexity of laws, regulations, official machinery ... by the power of organisation and the ever-increasing hold of technostructures. The world is conditioned by the mass media and by advertising.

How can we fail under these conditions, to fear for the actual freedom of man and for his actual capacity to control his own life ?

Cultural development is necessary for everyone. Thanks to such development it should be possible to find once more a social balance and equality which avoids domination and the abuse of life itself.

Every man should be able to reach a state of personal stability which will put an end to a "bitty" existence and once more bring together the activities of all.

This is perhaps the loftiest ambition of continuous education and one which should bring the richest rewards. This is because it is intended as a means of personal development and blossoming out and it can only achieve its goal by calling on all the techniques of expression, communication and mental enlightenment.

These reactions are not without relevance to our main theme. In fact, the question is how to promote this new attitude to work in men and women who entrench themselves in a world of

passive resistance and resignation, which brings with it work which is repetitive and devoid of all interest. People can only benefit from this process of enrichment of their own work if they are aware of the need for change and if they feel themselves able to cope with such change.

Continuous education and continuous vocational training

Thus we have illustrated the need for continuous training which combines cultural development, acquisition of new knowledge and technical know-how and initiative.

If we look at what really happens, we can see that this is not always the case. Although it is true that short retraining courses for new jobs can be successful - without the necessity for a more general training - in most cases, however, a more general training is absolutely essential. If this basic fact is not admitted, then there is the risk of a great deal of disillusionment insofar as continuous training is concerned.

SECTION TWO

INITIAL EDUCATION AND CONTINUOUS EDUCATION

The development of continuous training cannot fail to have repercussions on initial training. The aim of continuous education is to complement knowledge already acquired, or bring it up to date, to correct educational disparities or encourage specialisation in the right subjects: in other words to provide knowledge which could not be acquired at school or at university.

However, this is only the first stage of development.

Continuous training would soon find itself very limited if initial training was not reviewed in line with a policy of education which is to extend throughout a person's whole life.

This is the prospect offered in rethinking educational systems which have not lived up to expectations: the battle against inequality of opportunities has not brought the hoped-for success it promised, despite the increase in the amount of money spent on education and the raising of the school-leaving age. The passage from the channels of education and teaching to professional and business outlets is becoming less and less efficient. Perhaps this can be explained by the fact that because of the rapid changes which occur to the qualifications set-up, the content of work and the labour market, there is an ever-increasing questioning of the education system in general on the part of young people who would like to see a greater degree of initiative and choice in teaching methods and teaching material and a new kind of relationship with teaching staff.

From this threefold point of view, continuous training provides a rough solution or a useful grounding on which to rethink the whole education system. It also follows that initial education can also provide a suitable basis for continuous training.

Initial education - preparation for continuous education

Experience has shown us sometimes how difficult it is to make a success of continuous training in the case of a worker whose initial education has been something of a failure. However, this is only an extreme example to illustrate a more general theme.

How, for instance, does one prepare the young student to face up to progress and the accumulation of knowledge?

The reply is seemingly simple: you have to teach him to learn.

In fact the matter is much more complex. What is he required to learn? At what age should he learn it? How do you avoid cramming the mind with useless knowledge and thus forcing out what is essential? Maurice REUCHLIN raises the matter in his work: 'Teaching in the Year 2000' (1).

1) This survey was carried out at the request of the European Cultural Foundation. It is published by Presses Universitaires de France (SUP Collection).

"It is an undisputed fact that the rapid acquisition of knowledge requires an education based on 'savoir faire' - an education where one is 'learning to learn'. But can 'savoir faire' exist without 'knowledge'? Can you 'learn to learn' without learning ? "

Therefore initial education without knowledge cannot exist.

However, it is reasonable to limit the volume of knowledge, bearing in mind of course the particular and obvious requirements of some branches of higher technology, and to avoid too great a specialisation which would consequently be a drawback in continuous training in a different field. Lastly, it is above all vital to put the pupil or the student in a position to be able to profit from knowledge subsequently acquired by continuous training. Teaching must therefore be geared to better one's general education and professional and business abilities.

These principles seem to hold good both for the skilled worker and the engineer. Both will have to cope with change in all its forms: job content, certainly, but also changes in the internal set-up of the firm and its organisation, the promotional ladder and work relations, job distribution - all things linked with improvements in working conditions.

Continuous education as a means of teaching within the working context

In its practical connotations continuous education leads to situations involving teaching within the working context, i.e. the co-existence of a training stage and a working stage, which are obviously inter-related. The worker is therefore led to reflect on his training in relation to his professional experience and on his work in relation to his newly acquired knowledge.

Now, in France particularly this experience extends to young people who have just passed through the education system.

Because they cannot find jobs suited to their initial training or because their initial training proves to be insufficient or inadequate, they are forced to resort to continuous training courses, either after they have been in a job for several months or whilst they are still employed in such a job. Sometimes, their employers ask them to attend a course intended to bring their qualifications up to the required standard.

A lot of positive teaching comes out of this. First and foremost, the young worker, confronted with both work and training at the same time, increases his opportunities of finding a niche for himself, by giving him actual professional experience, and putting his tastes and abilities to the test, at the same time letting him take a more active part in the training process (1). It would appear, then, that this formula makes it possible to overcome certain anomalies between the outlets provided by the training system and the requirements of the economy for qualified staff; these young school-leavers, who have left school often without any valid technical training, can then acquire the knowledge they need within the framework of a continuous training scheme, alternating with actual professional experience.

Towards a new concept of the education system as a whole

This new concept, which some people class as 'recurrent' education, consists of bridging the gap between the period of youth devoted to study and the period of adult life devoted to work. Education and work should go hand in hand throughout one's whole life.

Bearing in mind the experience already acquired within the framework of continuous education, one could expect an improvement in the education system on several fronts:

- Evening out of prospects and opportunities: this would be made easier by the disappearance of factors which, during initial training in its present form, constitute drawbacks to any subsequent promotion of the person concerned.

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(1) And in any case more actively than if he were being taught in a college or university.

- Personal development could be achieved in a more satisfactory way by means of a system which, within the process of learning about life, encourages actual personal experience gained outside the traditional teaching field, by taking part in life 'for real': short periods of job experience, social activities. This is, after all the aim of education within the working context.

- The chance to acquire knowledge becomes of prime importance in a society based more and more on the accumulation and even the production of 'know-how'. It would be more open to everyone, and would be in line with the requirements of professional life or even the desire for cultural betterment on the part of the people concerned.

- Adaptation to the requirements of the economy and hence the labour market, would be carried out more realistically and more flexibly - and hence more cheaply.

SECTION THREE

EDUCATION POLICY AND WORK POLICY

DYNAMIC FACTORS AND STAGNATION

FACTORS

Because of the very reason of its ambitious nature and the diversity of its aims, both human and technical, a policy of continuous training cannot fail, if put into operation on a large scale, to have very considerable repercussions on the conditions of a man at work. It is important to appreciate the undeniable dynamic factors as well as the stagnation factors which may be concealed either in the very concept of continuous training or in the attitude of bosses and staff.

Dynamic factors

The first thing to be expected is a sudden awareness on the part of the worker. In fact, the worker is taken out of his everyday routine; he escapes simultaneously from the daily routine of work and the sometimes overstressed promotional ladder with which he is always faced; he finds himself in a different atmosphere where a whole world of new knowledge is open to him, as well as a new type of human relations, particularly insofar as the instructor is concerned. After a short transition period, which may sometimes prove to be difficult, one notices that the person concerned begins psychologically to unwind.

From then onwards he may become more demanding about his own work conditions and may discover prospects of changing his job, moving around of his own free will or the chance of promotion.

And at the end of the training period, the worker shows himself to have a greater ability to adapt to change, provided of course that the training exercise is a success. If it has indeed been a success the person concerned will have blotted out the bad memories he may have had about his time at school and will have noticed that continuous training is based on an exchange between the instructor and the person being trained, and not on a onesided transmission of knowledge. Because of this he will take an active part in his own training; he will be encouraged to define what he himself needs, and then what he wants. This voluntary contribution is of course the basis for all positive attitudes to proposed or desired changes in circumstances.

Self-confidence also lies in the improvement of one's educational or cultural level. Thanks to the training system, the person concerned will be better able to understand his own work environment, the usefulness of it, the opportunities for changing it by broadening or enriching the job content ....

In other words, continuous training gives the worker greater motivation, makes him no doubt less dissatisfied with his lot, more knowledgeable about his work and better suited to take part in a process of change.

But is this always the case ?

Stagnation factors

These factors should not be underestimated.

Their root cause is the lack of motivation of many workers.

To such a degree that the most vehement critics of continuous education feel that it is pointless to expect results from such people, if we cannot change the model of society, based, they say, on meritocracy and the importance of consumer goods. In other words, on the basic inequality in the access to knowledge and responsibility and the passivity of the consumer manipulated by advertising, the mass media and opinion polls, etc.

This questioning of the system must be examined closely. It is true in fact that the psychological unwinding to which we have just referred is not easy to achieve in the context of our society. In any event, it proves to be impossible every time that the training course is compulsorily imposed by the firm, every time that it boils down to a transmission of knowledge from 'on high' to the workers or to obtaining a working knowledge of a certain technique. The tendency towards the development of such procedures is made worse by the apathy of many workers who are sufficiently imaginative to see the advantages that continuous training could bring to them outside the general terms they read about in the papers. Hence the importance of an examination of training from both the educational and psychological viewpoints, and an assessment of these generalisations about training which are liable to attract possible students and get them out of themselves, revealing their hopes and their requirements.

In other words, if care is not taken to avoid it, continuous training could lead to the reproduction of a standard pattern of society or methods of work based, as we know, on an overdivision of jobs and a very often misused promotion system. It should be stated that this is the tendency of many training policies followed by business undertakings.

Two quotations will illustrate this state of mind: for instance, the head of a firm said that a training policy should 'make it possible for a person to feel at home and as if he belongs in his environment'. This statement is to be criticised insofar as it reveals the afterthought of only adapting the man to fit in with his work or his surroundings. It is reminiscent of those so-called policies of human relations which reduced the problem of the man at work to a purely psychological one.

Or the other business executive who stated his preference for training given within the company by saying: 'If training is given outside the company there is the risk of people learning things which they can neither adapt nor use once they come back to the firm. This is very frustrating and utterly pointless'.

Here we see an attitude contrary to that which regards training as a dynamic factor insofar as it encourages people to want better jobs and makes them feel a certain dissatisfaction which prompts them to summons up their energies to cope with change (1):

Fairly encouraging signs

During the course of the conference it will no doubt be possible to compare the opinions of the various delegates on the opportunities and actual risks involved in continuous training in their respective countries.

Insofar as France is concerned, there seem to be some fairly encouraging signs. Of course it is true that there are still not many workers who express a desire to follow a training course of their own accord. In this respect it is to be hoped that the joint action of trades unions representatives and the information services (particularly those responsible for employment policy) may encourage a considerable increase in individual enquiries and applications, particularly as the French system is based on the existence of a right to training on the part of each wage-earner and on the practice of consultation and planning within the firm itself. Furthermore, business managers are themselves anxious to broaden the scope of their training policy and make it much more than a formal vocational training.

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(1) As the sociologist CHOMBART DE LAUWE pointed out in 1968: 'Continuous training is the discovery of the needs and hopes of man... it is a realisation of self, the accomplishment of the individual within a particular group and society'.

Some hopeful signs can be seen from the attitudes of workers themselves, as revealed in the answers to the random sample survey, the findings of which are attached to the present report.

It appears that three quarters of workers are familiar with the laws governing continuous training and feel that a period of professional training could help in improving their professional and social lives. What is more, their aims are more varied than the pessimists might think, as they include personal betterment, concern about taking on a different kind of job, as well as a desire for promotion and a wish to update their knowledge.

SECTION FOUR

TRAINING REQUIREMENTS IN RELATION TO IMPROVEMENTS IN WORKING CONDITIONS

The dynamic factors contained in the policy of continuous education are not therefore such that they could alone promote an irreversible movement in favour of improvement in working conditions. It is in fact clear that the situation of the man at work is such that it does not always lend itself to promoting the desired change, however much this may be required; in some instances the sudden awareness is speeded up by a dispute which leads wage earners to protest about their working conditions or even methods of payment, which they feel are not in line with the disciplines and requirements of their trade or profession.

All in all it can be said that it is up to the Authorities and Company management to take the initiative and consider negotiating a new work policy, which would enable workers to get away from the various alienating factors which threaten their jobs. Once this process is underway, it will be noted that such a policy can only be successful if it is backed up by training schemes which meet the various requirements which we are about to look into.

An attempt at greater awareness

Very often, resignation, passivity, limited knowledge and a lack of self-confidence stand in the way of any attempt to broaden job content and make it more interesting - particularly when wage-earners are immediately suspicious of any efforts made by the bosses or the "powers that be".

How can such trends be reversed other than by offering the people concerned the change of continuous education, in such a way that they will regain their self-confidence, have a better grasp of their trade and an understanding of their work environment, and be better able to express their desires and requirements in relation to their own particular job. This is where the driving force of education can play its part to the full: by getting rid of a fixed situation, encouraging awareness and bringing to light hopes and expectations.

Such action may start within the surroundings of the factory, work-shop or office by means of a discussion with the supervisor, engineer or head of department, to be taken up again later with the continuous training representative.

Ways of carrying things out, communicating or reacting

Once this process of making people aware has been carried out, what remains to be done is to create working conditions which require not only set techniques and ways of carrying things out, but also a new approach which will permit of initiative and communication. This means that the type of training to be carried out cannot be restricted to vocational training in the classic sense, based on a minimum knowledge of the tools and operational techniques. What should be developed is an aptitude for communication and relations with other people, thus enabling an overall grasp of the whole production process in which the worker is involved.

But one has to go further in order to find a situation which permits of initiative and creative ability. This is why self-training and self-assessment should be encouraged as they tend to increase the capacity of the person concerned to take his problems in hand and to react to any unforeseen occurence in the production process. 'Learning how to react' - this

is one of the basic and essential aims which should henceforth be taken into account in any education policy. (1)

Lastly, in the very important field of hygiene and safety, sufficient progress can only be achieved if workers themselves receive a specific training which enables them to become active participants and develop an ability to assess for themselves the risks involved in a particular job.

Some thoughts about one's own job

Continuous training therefore changes the worker's attitude from one of passivity to one of initiative. A logical outcome of such a development should be that the person concerned will be capable of giving some thought to his job himself and reflecting on the development of his working life. Only in so doing can he take advantage of the opportunities offered by a work policy: voluntary moves to vary his experience and a chance to demonstrate his personal abilities; decide on how to arrange his time at work and how much time to devote to training and to leisure; be capable of giving a more positive content to relationships involving communication or submission to authority.

Obviously one cannot conceive of such a development of the young man or woman concerned if he or she is not training towards this more voluntary approach whilst still at school, with a view to being able to control his or her future working life. This of course brings into question the whole approach to teaching and teaching methods: this is where, from this point of view, education within a working context has several trump cards to offer insofar as the young person is brought face to face with his working life, his own attitudes and tastes; he gains a very valuable experience which will stand him in good stead in the future.

Training managers and engineers

The development expected of a work policy will considerably increase the scope of knowledge required from managers and engineers, as well as requiring them to have a greater awareness of the problems thus involved. Whether it is a question of technical matters, like designing a new factory, or collective labour organisation, or matters of economics, such as the choice of investments of the calculation of profitability, or even social matters, such as the relationship between a man and his work, reactions to authority, etc., the people concerned have to bear in mind new criteria on which to base their decisions and any action they may take.

For this reason it would be a good idea to give serious consideration to the content of training courses provided by the universities, engineering colleges and business school. Three main avenues should be explored and looked at in greater depth as and when research and experiments progress:

- Information relating to automation, to organisation of work based on job enrichment and the setting up of independent shifts;
- Psychological, sociological and physiological factors involved in one's working life and in production as a whole (particularly a look at industrial relations, biotechnology, etc);
- Methods of assessing economic and social performance of companies: totting up of human resources, cost/profit analysis, social pointers, etc.

In short, training policies could contribute to a work policy by bearing in mind five main objectives:

- to encourage a greater awareness on the part of the worker;
- to raise the worker's level of education in order to get over the psychological barriers to change;

(1) This theme has been particularly developed by Bertrand SCHWARTZ in "The Education of Tomorrow", published by Aubier-Montaigne.

- to develop the worker's knowledge about the environment of his professional activity;

- to open up new prospects to workers by increasing their technical skills and teaching them how to react;

- to encourage communication and the ultimate taking on of responsibility.

Whatever one may hope for from the development of continuous education, in order to promote and encourage a movement on the part of workers in favour of improvements in working conditions, it is of equal importance that other conditions should also be fulfilled.

First and foremost, it has to be accepted that this work policy must be embarked on on all fronts, in such a way that the worker is convinced that by making use of the various opportunities open to him he may find in his work a means of proving himself and showing his full worth - work will become more than 'a means of earning a living'.

Secondly, we must not be afraid of the upsets and confusion which will be caused by the change in the worker's attitude from one of passivity to one of active participation in the production process.

It cannot be denied that new dissatisfactions will arise out of this new attitude, but it will also bring with it greater possibilities for creativity and initiative.

As stressed by Georges FRIEDMAN in his work 'The Human Problems of Industrial Mechanisation' (1) : 'on the factory floor .... workers tend not to use their potential aptitude to the full when they notice that this additional effort on their part is not rewarded by a fair increase in their wages and in fact only tends to work to the advantage of the firm. Nowadays we could add, 'when workers do not see how this effort would bring an improvement in their working conditions'.

Lastly, it would appear that such an aim, by its very ambition, requires that the educational system as a whole be reviewed. As we have seen the same applies in the case of continuous training which poses new problems to the education policy, but also offers it some answers insofar as teaching methods, teacher/pupil relationships and even the respective organisation of study and work are concerned.

Schools should bear these requirements in mind in order better to equip the workers of tomorrow to benefit from the improvements which may occur in working conditions.

Hand in hand with more interesting and varied work should go an increased aptitude for responsibility, initiative and understanding of the world as a whole ... the legacy which education should leave us. Education should not stop when one's working life begins, it should continue throughout one's life, in line with the needs and expectations of man.

(1) 1954 - Editions Gallimard - N.R.F.

Question : What do you chiefly expect from training ?

	All wage-earners	Senior Management	Middle Management	Office Staff	Workers
	%	%	%	%	%
- Training which will result in promotion within the firm	34	31	34	44	30
- Keeping your technical knowledge up to date in order to be sure of your job	28	23	35	21	30
- Personal betterment	19	27	24	16	15
- Training for taking on a different job	11	16	5	13	13
- Don't know	8	3	2	6	12
	100	100	100	100	100

Question : If you had occasion to attend a general training course, what would interest you most ?

	All wage-earners	Senior Management	Middle Management	Office Staff	Workers
	%	%	%	%	%
- Written and oral expression (learning how to express yourself better and how to write better)	32	12	30	34	39
- Business relations and social problems	26	43	26	27	22
- How the company operates and how the economy works	24	32	28	26	20
- A purely cultural training (painting, music, history)	8	11	13	7	5
- Don't know	10	2	3	6	14
	100	100	100	100	100

REPORT OF WORKING GROUP V

"PROBLEMS OF EDUCATION AND TRAINING"

PRESENTED BY MR. J. DELORS, PROFESSOR AT
L'UNIVERSITE DE PARIX IX - DAUPHINE ET
L'ECOLE NATIONALE DE L'ADMINISTRATION

The connection between education policy and a revised work organisation, the main subject of this Conference, is clear. Without turning education into the focal point of this policy of improving working conditions, to justify the inclusion of this subject in the agenda of this Conference, it may be said that those concerned with improving working conditions may expect several positive results from an education policy. It will:

- first, stimulate the worker's awareness of present working situation and the possibilities of improvement;

- raise their cultural level to enable psychological barriers to change to be overcome. The barriers will be all the stronger for the change being rapid and badly implemented;

- develop knowledge relating to the environment of their vocational activity in order to broaden the scope and horizon of the workers;

- give these workers the technical knowledge, apprenticeships and knowledge enabling them, for instance, to take part in job enlargement schemes or autonomous teams;

- lastly, favour communication and the workers' future share of responsibility in the new production teams.

All this could, indeed, be connected with a concept referred to by several members of the working party, experts in the problem of the improvement of working conditions. It consists in strengthening the workers' capacity for autonomy, ie make them capable of planning and completing a project by themselves. This is why the working party, in accordance with the Commission's terms of reference accepted in general terms its ideas on education policy. But of course the context of these ideas still had to be examined, and this is the first point I should like to discuss.

On the basis of these principles which were almost unanimously agreed on, we considered an idea mentioned in the preliminary report which gives a staggering view of the education system, generally referred to as continuous education, which has been the subject of study by the international organisations. Clearly, continuous education can only be a long-term project. It will take years to carry it out and, moreover, it can only become effective under conditions adapted to the historical, cultural and political traditions of each country. Rather than wait for this long-term prospect, the working party preferred, and this is the third point I shall discuss, to take steps towards this end, eg. the concrete factors which could at present reform the education system to enable the latter to bring its contribution to the overall policy we are attempting to define in this seminar. Three factors appeared important from this standpoint: the adjustment of basic education, the development of continuous education and training and, lastly, the implementing of alternating education.

A. THE CONTEXT OF OUR THINKING

In considering this matter, we started from two very different standpoints - namely, the undertaking and Society. You shall see that one of the most difficult points in any concept of education is the reconciliation of these two paths of thought. Some have argued from the standpoint of the firm, or rather, the organisations, since work problems exist as much in private as in public firms, in the firms producing goods such as the public or private organisations producing the services of the tertiary or quaternary sectors.

For the specialists of firms or organisations, the prime consideration emphasis was on the new values, new structures and new types of command and management to be provided in the near future by these organisations if the objective is to be reached, ie. the reorganisation of work. To achieve this, however, the experiments must be carried out in a living environment where man feels and expresses his needs and aspirations. The working party pointed out that the working environment was ideal for instigating an awareness in men or women of their aspirations and expectations and for encouraging changes stemming from the workers themselves. Others, however, although not against these steps, based their thinking from the society standpoint, summarised in one question, raised innumerable times in the past few years: education for what?

In an international conference, organised last year by the Chairman of our Working Party, Mr GASS, I was surprised to hear several persons responsible for education policy in the various European Countries roughly summarise their diagnosis of education policy. They said, simply, the more we spend on education, the less satisfied we are.

If we examine the ambitious aims of this policy, we can indeed see, that they have not been achieved as fully as desired. There is general dissatisfaction with the present situation, whether as regards individual development, the preparation of men and women for vocational life or the achievement of equal opportunity.

The Working Party has heard a number of participants, representing various countries, report on the experiments carried out to end this situation. One of the major points was the preparation for vocational life since it is directly connected with the principal subject of this Conference, the desire to better prepare the young for their transition from basic education to vocational life.

The two paths of thought resulted in a double requirement: on the one hand, radically alter the nature and constant of work: on the other, considerably change the structures and content of the education policy, of course, in the debates and discussions within the working party, we occasionally verged on utopian, but as you shall see, we returned to a more pragmatic viewpoint.

As regards work, we must aim, since we should always speak in terms of objectives, at a type of broad concept which would replace what for years has been the major preoccupation of those responsible for these matters, namely, an active employment policy.

The objective is to widen the margin of choice and strengthen flexibility in the organisation of work in order to provide each worker with a measure of freedom and autonomy. We must also improve the working environment, particularly, as Mr Lagrange has said, the hygiene and safety conditions, change the organisation and content of work: job enlargement, job enrichment, autonomous teams. But we must also improve hierarchical relations and develop participation, referred to by some as "industrial democracy".

These are the objectives selected by the working party as likely to constitute the contribution of the education system to the employment policy.

The concept of continuous education cannot be activated without major institutional and educational upsets. In order to place its ideas within a viable framework, the working party adopted two guidelines which should be mentioned before going on to the next item.

The State's responsibility in a new education policy is pre-eminent. However, since the link must be strengthened between education on the one hand, and society and the economic worth on the other, the responsibility of both sides of industry is equally involved. Without in any way disputing the State's pre-eminent role, since education's objective is not only employment, institutions must be found to enable both sides of industry to co-operate with the State and, in particular, and this should be emphasised all the more since those concerned were absent from the Conference, to stimulate participation at all levels of worker representation, from the level of the firm to the national level.

Furthermore, each worker must have the same rights. This is where the difficulty lies, for it is not enough to provide for such rights by law or in agreement between employer and worker. Workers must factually possess such rights. And we realised that, although the right of all to education was written into our constitution or laws, the actual behaviour of our teachers in the running of our education system belied the fact.

Of course, the two principles I have just mentioned should not lead you to think that the working party considers that we shall arrive at the same solutions for all the countries. I can only stress, like the other rapporteurs, that these two principles will be specifically adjusted to the traditions and policies of each country.

B. CONTINUOUS EDUCATION - A LONG TERM PROJECT

A fairly simple definition of continuous education can be given. It is a system in which education, employment work and private life are constantly inter-connected throughout a life-

time. Thus there is no one age for education, one for work, and for retirement, it is always possible to return to education, the latter being, according to Mao's famous saying 'a fish in water in society'. The advantages of this formula in relation to the reorganisation of work are obvious. First, equality of opportunity will be facilitated by the disappearance of factors which, in the present context of basic education, are firmly opposed to such equality. Secondly, the development of the individual would be obtained more satisfactorily with a system which encourages the young and not so young to make use of both formal education and social and vocational experience, the educational value of which can only be stressed. Finally, in a society where access to knowledge and knowhow is the key to power and autonomy, extended education possibilities should provide everyone, according to his means, with such access to knowledge and knowhow.

The last, but not least, factor is the presence of problems encountered in our countries in the adjusting of supply and demand on the labour market; continuous education should, with the advent of education in working life, provide a more flexible adjustment of supply to demand and, consequently, diminish the present stranglehold.

These are the advantages of such a formula.

I shall rapidly conclude on this item, since it is only a long-term project, by pointing out that it implies a teaching revolution and raises difficult problems of institutional and financial restructuring.

Let us first deal with the teaching revolution:
this educational system should boost the so-called concept of the personal project. Too many pupils and students are insufficiently involved. It is essential that education provide impetus for individual thought, that it enable an individual project to be defined and carried through. This can be done only if, to quote Professor TRIST, we increase the learning opportunities, eg. various opportunities for all to avail themselves of forms of education or experience enabling them to truly achieve their apprenticeships to life.

Lastly, one of the problems we meet on the labour market is that the young are often too highly specialised in a field which, having been defined ten years back, now no longer fulfills employment requirements. Emphasis should therefore be placed on the scope of the training courses and not on narrow subjects of specialisation. Continuous education raises legal and financial problems which I can summarise in two questions:
should the right to equal education be available to everyone throughout a lifetime and in what form? And secondly, who will finance the new system? The State alone or the State and the firms and, to encourage personal responsibility, should not those concerned participate financially on their own behalf in this system?

C. THREE GUIDELINES FOR PROGRESSING REFORM

First, the adjustment of basic education. Traditionally, it no longer enables individuals to adjust correctly to changes in vocational life and to make full use of opportunities. We are therefore searching for a basic education system which will teach the young to act in the event of the unpredictable and to guide themselves, to plan a project and, at all periods of their life, to learn new ways of doing things.

Secondly, the Working Party considered that one of the most important points was that basic education in its present form does not correspond to the aspirations of the young today. This, although the situation, I freely admit, differs in each country. It seems that the young are not satisfied with traditional teacher-pupil relationships in which knowledge is passed down from on high. The young, matured early by the mass media and urban civility action, are eager for discussion and exchanges of views. They also seek a variety of experience which the standard system cannot provide. Aware of these difficulties, several countries undertook experiments which provide the young with a broader education, one enabling them to hold their own in the labour market. Thus we heard of the experiments in Denmark, Germany, Ireland and France.

The problem is very real, it is mentioned in all the conferences of EEC Labour Ministries of how to ensure that young school-leavers waste as little time as possible in adjusting to the labour market? Professor TRIST said, rightly, that this would necessitate new institutions, which leads us to the first proposal we should like to make to the Commission: why shouldn't

the European Economic Community launch an overall study on the methods of ensuring the best transition between school and employment? It possesses a high trump in this respect - the large number of experiments undertaken in each country.

It would thus be a question of providing a transition phase in which each young person would have two, four or five years to test himself and to adapt to vocational life. This solution seems far better than the pursuit of unmotivated studies or premature entry into vocational life which generally restricts the opportunities open to the young and definitively ends their possibilities of promotion and self-development. The transition phase should be based on three essential factors: a clearer and more regular information policy, a differently designed guidance policy and lastly, an open field for the young to acquire experience in vocational life.

The second area of reform: the development of continuous education and training. Here too, we have heard the report on experiments carried out in each country. I will only point out the objectives of continuous training:

- control of change;

- the fight against unequal opportunities which include, and we should not forget this, those arising out of the family and the cultural level, and those between men and women;

- personal development, which means the incarnation, at the level of everybody, of this idea of self-management, which, after all, is only the aim of each person today at a time when the fundamental problems of hunger, basic education and health are solved, the hope nourished by each person that he will acquire a degree of independence and manage his own life.

Of course, the application of the continuous training policy to changes in the undertaking would have merited further study by the working party, had there been time. With continuous education, it is possible to stimulate the worker's awareness of the changes due and give birth to the new aspirations mentioned before, strengthen his aptitude for change, his capacity for autonomy. There is a fundamental reason for this, which can never be sufficiently emphasised, and that is that while basic education is the transmission of knowledge from above to below adult education is a negotiated form of education. A teacher cannot, in general, force an education programme on other adults, he can merely negotiate it in keeping with the aspirations and culture level of those concerned.

This possibility of negotiating his own education is the first step towards a person's control of the changes occurring in his vocational life. The Working Party, however, discovered a number of obstacles to the development of continuous training and education. The main obstacle, under present conditions, is the lack of motivation in a number of workers, particularly those who left school early or for whom school is a symbol of failure and boredom, which takes us back to the importance of modifying the basic education system mentioned above. If we accept the concept in which a continuous training policy is a dynamic factor in the conversion of work organisation, how should such continuous training be developed. There are two essential points: first, can we develop continuous training without acknowledging the right to continuous training either legally or in a national agreement between both sides of industry? Secondly, what would be the value of such a right without accompanying financial guarantees to ensure its implementation? In other words, an actual right to continuous training is a worker's right to take time out of his working hours and obtain financial guarantees in respect of remuneration and education fees. Taking this into consideration, we proposed three guidelines:

- the European Centre for Vocational Training, due to be set up should collect data on continuous training experiments connected with the improvement of working conditions;

- if, as I hope, the Centre itself can carry out training experiments, the latter should cover two or three countries; young persons from one country should be able to take trainee courses in another country. Thus, wider industrial or working experience could be obtained than is possible in the country in question;

- Since provision for an objective in the Community's social policy can affect each country, would it not be desirable to include the right to training in the priority objectives of the Community social policy for the next few years?

Lastly, the Working Party dealt with alternating education, the crossroads of the education system and the undertaking system. It is necessary to combine, into a coherent whole, working experience and education. In this way, the educational value of employment is acknowledged, a point stressed by the Working Party members. The essential needs of working life and the life of the undertaking are thus recognised, the desire of the young for self-experimentation is given an answer. Whence another suggestion: why shouldn't the European Economic Commission play a principal part in this field? Could it create a framework in which continuous education is encouraged, backed, if necessary, by the financial resources of the Social Fund?

Emphasis on the necessary reform of the education system should not entail forgetfulness of the two other components of the problem: the implementing of a new work organisation capable of fulfilling the aspirations of men, and strictly defined from the economic and technical standpoint: the facing by Society itself of the values crisis shaking the contemporary world.

Realistic results can only be achieved by taking action on three fronts: society, work, education.

SUMMARY OF THE CONCLUSIONS OF THE WORKING GROUPS

PRESENTED BY

MICHAEL SHANKS, DIRECTOR GENERAL OF SOCIAL AFFAIRS, COMMISSION OF THE EUROPEAN COMMUNITIES

I do not think we should try today to draw up a formal set of conclusions from this conference. What we should do in the Commission is to analyse the recommendations, and ideas that have come up at the conference and see how we can turn them into proposals for action at Community level.

I am not going to respond here to every one of the very interesting and valuable ideas which have been put forward by the rapporteurs, nor clearly can I give you anything like an official Commission view because we are still in the process of formulating our views at the service level of the Commission. What I shall try to do is two things: first of all, to indicate the way in which up to now we at the service level of the Commission have been considering this subject and our first ideas on it, and secondly to give some reactions; in some cases they would have to be personal reactions because these are ideas which have come up for the first time this morning. I shall try to give first reactions to some of the points made by the rapporteurs.

The question of terminology is clearly a difficult one in this field, so I should like to use the phrase humanisation of work to describe what we are talking about, and I should like to set this first of all in the context of the broad social objectives of Community policy. I mentioned on Tuesday the precise context in the Council resolution of January within which this conference is set, but I think one could also set it in a rather broader context. The three main guidelines of the Social Action Programme of the Community are: - improving living and working conditions, participation, and full and better employment. There are obviously relations between humanisation of work and all of these three, bearing in mind that most of us spend most of our waking time in one form or another at work. Within that broad context, there are a number of specific policies that we are following which relate to and impact on questions of humanisation of work. For example, and I will not give a comprehensive list, but just some examples, in the field of employment policy we are particularly concerned with the vulnerable categories: the migrants, the women, the handicapped, who after all tend to have a bigger than average proportion of the dull and dirty and unpleasant jobs in our community to do. Secondly, within employment policy we are particularly concerned through the use of the Social Fund, about which I shall say a bit more later on because it has been mentioned by the rapporteurs, with aspects of training and retraining workers and the upgrading of skills. Another category of specific policies are the directives relating to conditions of work and job security which we have presented to the Council of Ministers. For example, the proposed directive on mass dismissals (we are now looking at the field of individual dismissals as well), and the preservation of rights of workers when the ownership of their firm changes hands.

Thirdly, we have proposed, and I hope that the Council will agree in December, the setting up of two institutions: the Foundation for improving living and working conditions and the European Vocational Training Centre, both of which are clearly relevant and have an important part to play in any comprehensive programme of humanisation of work. Again I will be referring to these in more detail towards the end of my talk because they have been mentioned by more than one of the rapporteurs.

There are the programmes of health and safety, on ergonomics and on environmental protection, all of which are clearly relevant to the humanisation of work. Finally, there are the proposals of the Commission with regard to participation, ie the European Company Law Statute and the Fifth Directive, both of which are also clearly relevant to industrial democracy and the organisation of work and which have figured largely, it is clear from the rapporteurs' reports, in your discussions during the last couple of days. This leads to two questions: how to insert into this general context, specific improvements in the organisation and the humanisation of work. "How", is the first question and the second question I think we have to ask ourselves, is "why". Why is it important, particularly now when we face so many different and urgent problems in the Community, to spend time on trying to find ways of humanising work in the Community? We have to be prepared to answer this question of why.

Part of the answer was given by Professor Albeda when he talked about crises as being the usual motivating factors behind attempts to improve the organisation of work, and we face as you know too many crises in different sectors and parts of the Community at the present time. It is easier and better, as Professor Albeda points out, to deal with crises before they arise rather than after. What are the aspects of these crisis situations which particularly stress the importance of humanisation of work? First of all, I think it is quite clear that standards and expectations throughout the Community with regard to work are rising and rising very fast; conditions which were quite acceptable ten or even five years ago are unacceptable today, and this, I think, is linked with rising educational levels throughout the Community.

I believe that this for example has been a very important factor in the problems that some sectors of Swedish industry have encountered, and since we cannot hold back, and should not want to hold back, the development of education, it is clear that this problem is going to get worse rather than better unless something is done about it at the industrial level.

Secondly, as I mentioned a few moments ago, a substantial proportion of the dull and dirty jobs in the Community have been and are today being done by migrants, and it is quite clear that the dependence of the Community on migrants will diminish. At the present time as you know many governments have imposed a block on the new recruitment of migrants from third countries.

This means that if we are going to rely less on migrants, or if we continue to employ migrant workers to raise their conditions, then we have to improve the quality of the jobs that they are at present doing.

Thirdly, this whole subject of humanisation of work is moving into the arena both of collective bargaining, and there a number of examples which I shall give in a few minutes, and also of political awareness. But at the same time it is clear that there are difficulties (the rapporteurs in almost every case have referred to them) to see the scope for legislation or government action within this field, where governments feel that something needs to be done but find it very hard to see what can usefully be done at governmental level; and that is one of the reasons for the importance of this conference to try to find ways through this problem.

Fourth, and particularly important, is the technological opportunity. It is clear that the developments of modern technology have created new opportunities for moving away from Taylorism, from traditional scientific management, towards newer and more exciting patterns through the use of autonomous work groups, for one example, or for the full automation of some of the worst jobs. We are now entering technologically it seems to me an era of experiment when all opportunities become open and when technology can be put at the service of man, but if, and only if, we know first what we want to do.

Fifth, it is clear that we are witnessing a dramatic growth in shop floor democracy, in what one of the participants to this conference has described in a recent book "job power", which is expressing new psychological needs of the workers and also - very important - is reflecting new power relationships within industry. We see the institutional reflection of this in the development of works councils, on Comités d'entreprise in the different industries. One of the questions that we should address ourselves to, it is reflected in the comments of the rapporteurs, is what kind of role these bodies could play in the humanisation of work.

For all these reasons, the subject is and will remain a priority one on the Community agenda, and the next question that arises, if we are going to bring through changes, what are the potential agents of change.

First, and far and away most important in this context, are the Social Partners. Because the way in which change can most effectively be made is by agreement between the social partners at the level of the business enterprise. The relationship between the social partners falls into three broad categories. You have the area covered by negotiation, the area of conflict, you have the area covered by consultation, and you have the area where conditions are affected by legislation. I do not think that one can exclude any of these elements because, as Kenneth Walker pointed out in his paper, the same objectives can be pursued by different methods, at different times, in different places. What is constant is the drive on the part of the workers for better conditions. The method by which that drive is expressed, whether through consultation or through influencing legislation, is a secondary factor, the important factor is the continuing pressure on the part of the workers for better conditions. Typically in the past and today, the areas covered by this social partner relationship cover such things as remuneration and working time, social protection, the physical working environment which, as Mr Lagrange has reminded us, is still of vital importance in the humanisation of work, employment policy, personnel policy, and the formal structure of decision making. Up to now technological development and its implications have normally entered into this field through management prerogatives, through attempts by management to change the technological structure of work and the reactions of trade unions to these attempts. Management in a sense has had to buy the right to initiate change. This has been expressed, for example, in the productivity agreements which were a very important part of collective bargaining in the UK in the middle 1960s, but the implication has been that change is something which is hostile to workers and it is something that management gains from and therefore has to pay a price to trade unions in order to achieve. I wonder whether that in fact is now changing, whether it is becoming more the case that some of the changes that can now be bought in

reflecting new technology, new knowledge can be at least as much benefit to the workers as to the employers. We are beginning to see a new element therefore entering into collective bargaining. For example, one could mention the Danish Metal Workers' Agreement in 1970 on autonomous group organisation, the German Metal Workers' agreement for Nordwürtemberg, Nordbaden in 1973 including a minimum work time span, or if we take individual companies, the Olivetti labour agreement of 1971 stipulating job redesign activities, new production techniques, etc. and the Fiat national agreement of March 1974, and one could mention others as well, for example in France the Renault and Jaeger plant agreements. But the crucial fact is that if change is to be brought about effectively it must be by agreement at individual plant level between the social partners, whether the initiative is taken by the employers or by the trade unions. In addition to the role of the social partners, I think one should list as the second important agent for change, more formal initiatives. These come into two categories. They have been described very well the first day of our conference by Professor Trist and Professor Thorsrud. There have been some cases initiated by management with the help of consultants like the Tavistock Institute, by individual firms, and this has been going on for twenty years. The surprising thing to me in this area is how little knowledge exists outside the particular enterprise involved of the work that is being done in individual firms, and this question of the diffusion of knowledge has come up again and again in the work of the working groups and in the reports of the rapporteurs this morning.

There have been two more generalised initiatives which are particularly interesting to us; those in Norway and in Sweden. I think that it is very interesting to compare the different approaches followed in the same area in Norway and Sweden. In the Norwegian case, you have had a highly centralised process of change, strictly controlled, I think it is fair to say, by the central organisations of the employers and the trade unions working with consultants, working very closely together. In Sweden you have had much more approach taken more on the initiative of management, certainly with the co-operation and agreement of the trade unions, but aiming to operate on a more decentralised basis than the Norwegian experiment. I think it is useful to us in the Community to compare the relative good and weak points of these two experiments.

Third, among the agents of change, are governments. It is clear that governments are beginning now to move into this area with the setting up of new institutions, and one of the important things that we have to consider is how these institutions could be developed, what kind of liaison between them and any possible Community institutions might be developed. There are institutions to promote exchange of information, research and experimentation, either in the case of tripartite committees within ministries of employment as in the UK, or as semi-independent national agencies as in France, or in the extension of fields of activity of existing organisations such as the Office Belge pour l'Acroissement de la Productivité. There are an increasing number of research programmes being carried out on a very large scale, particularly in Germany with the governmental research programme on work humanisation launched in May 1974 to give concrete substance to the theoretical objectives of the works' council act of 1972; and while one is talking about research into this field in Germany, I think one should also mention the very ambitious multi-disciplinary research project in this field being undertaken by the DGB Economic and Social Research Institute. Then of course there is the question of government legislation. One has the development of Mitbestimmung in a number of European countries, the development of compulsory works' councils, and in some cases also experiments in legislation which I think are in some ways particularly interesting in our context, in the context of work humanisation. For example in Austria where the works' councils act established specific procedures and criteria to be used in the design of new work processes to meet human requirements. Similar objectives have been achieved in the Scandinavian equivalents of works councils established by collective agreement. While one is talking about Sweden there is the very interesting use of the Swedish investment fund for improvements in the working environment. I shall come back to that in a minute because it has possible implications for the use of Community instruments as well.

Finally, for completion I think one should mention the role of governments as employers. Here one has to say that governments have not on the whole played a very creative role in the humanisation of work in their capacity as employers, but maybe this will change. Having described some of the agents for change, I think one should now look at what are the main constraints, and a number of these have been mentioned by the rapporteurs.

First of all, perhaps most crucial, is the problem of the new roles which work humanisation requires of the different people concerned. The role of the manager who has to move away from a hierarchical structure, particularly the role of the middle manager and supervisor who is directly accountable to his boss for performance but at the same time is having to

operate now in a more flexible, more democratic structure which may conflict, or may appear to conflict, with his own responsibilities. This aspect has been mentioned by both Miss Klein and Professor Albeda and it is a very important deterrent to progress in the humanisation of work.

Secondly of course, workers taking part in an autonomous work group face new responsibilities and new disciplines - mental disciplines - which some of them may not want to have. It has been said in this conference, and I think it is true, that we should not assume that every worker wants his job to be enriched; then there is of course from the point of view of the trade unions a conflict with their traditional roles, or there may appear to be a conflict, if they are to take an active part in the developments of the humanisation of work for their members. So that is one constraint: the problem of new roles for the participants which relates directly to the problems on the educational side that Mr Delors referred to in his report. A second constraint is the problem of isolation. Many of these experiments take place in sectors of industry where there is ignorance about what is going on outside, ignorance about the relationship of the experiment to the general climate; and there is the corollary, the risk of what one might call the 'goldfish bowl' syndrome: the feeling that one is taking part in a very interesting scientific experiment may well affect one's attitudes to that experiment.

Thirdly, there is the problem of training and education, which is the core of the work of working group V which has been dealt with in great detail by Mr Delors. There is the need not only for better education of workers but also for value changes, fairly radical value changes, in the professional training that we give; we need to find some way of bringing social values into the training for example of engineers and of the technicians and technologists who create the environment within which workers have to work. There is the particular need to establish better links - I agree entirely with what Mr Delors has said about this - between education and industry, especially for young people who find increasing difficulties in relating their education to industrial opportunities.

Finally, among the constraints, I think one should mention the economic constraints which were the subject matter of working group IV and with which Professor Albeda has dealt. Clearly, experiments in humanisation of work have to be related, as Professor Albeda has said, to some kind of cost accounting, and I wonder whether we should look more deeply into our accounting conventions, into the way in which cost accounting is taught. In any case many of our accounting conventions are outdated, I believe, with the inflation that we are now experiencing, and I wonder whether more could be done in research at Community or national level on some of the factors which are underweighted in the accounting course which we now teach. There is another factor related to this which I think we should consider: whether we need to do anything at national or Community level to remove the competitive penalties, real or imagined, which social innovators may face in a common market. Clearly, if some firms or some countries are moving faster in social innovation in industry and accepting new responsibilities which are not faced by their competitors, this could distort the pattern of competition. I think we need to look to see whether there is anything that needs to be done in the field of equalisation of competition to remove such penalties if they exist.

This brings me to the final section of what the Commission can do in this general field. First of all I should like to refer to the Foundation for living and working conditions, because it seems to me that this can be one of the main instruments by which we can make progress in this field at Community level. This has been referred to by Mr Lagrange, Miss Klein, Mr Raievski and Mr Delors. They have in each case given a list of things in the field of research, documentation, pilot experiments, establishment of a job analysis grid, glossary of terms, etc. which might be done either by the Commission or by the Foundation. My own feeling is that it would be useful to think first of all in terms of the Foundation, as being the main instrument for dealing with these matters, so that I believe that we should look at the possibility of giving the Foundation responsibilities in the field for example of collecting cataloguing, classifying information on activity in the field of work humanisation. We should give it responsibilities for the promotion of action research and pilot experiments carried out in conjunction with specific industrial sectors and clearly in agreement with, and in full co-operation with, the social partners concerned in those sectors. It should clearly I think have an active liaison with the existing national agencies as in France, the tripartite bodies as in the UK, Ireland and Denmark, and I believe that it would be useful if such bodies could also be developed in other countries of the Community. It could also have an important role in the exchange of information, including the exchange of people and experts, between the different sectors in the different countries of the Community. It may be that the question of working out a code of good conduct, which has been referred to by the

rapporteurs, might also be a role for the Foundation, and added to this I think one should say that the Foundation should have a very important job of developing research in the field of ergonomics in particular. That is one instrument which I think can be very useful in this field.

Secondly, there is the possibility of using the sectorial approach. For example, where they exist at Community level, we could use the joint committees as a co-ordinating framework in those sectors where the social partners are willing to sponsor and encourage specific experiments. This would be very like the Norwegian experience, but it would obviously depend on the willingness of the social partners at the sector levels to play an active role in helping to develop these experiments.

Thirdly, and this is a point raised by Mr Legrange, the question of investment incentives. Here we have two instruments which could potentially be used. One is the European Investment Bank and the other is the European Social Fund. It might be, and I am thinking aloud here, that one of the criteria for loans from the European Investment Bank might be investments with a clearly social purpose, investments in social innovation, and it might be again that one could be used for particular experiments and particular investments in the field of social innovation. This is the point which Mr Delors mentioned as a possibility, and I think that is certainly something that it would be useful for the Community institutions to look at. There is the general question of the promotion of education raised by Mr Delors. It is clear that any work in this area has to be a joint involvement of those Directorates-General concerned with social and industrial development and the Directorate-General concerned with Education. Clearly, there is a very important job to be done in trying to influence the professional education carried out in the different Member States. In this context one should look also at the role of the European Centre for Vocational Training which Mr Delors has referred to, and I think one could also mention as a possibility developments within the European Trade Union Institute which the ETUC is considering setting up. This of course would be primarily a matter for the trade unions themselves, but I believe that the Trade Union Institute could have a role to play in this field in broadening the training and educational background of those of its members particularly concerned in this area.

Next, there is the question of specific functions to be given in this area for Works Councils. I am very much impressed, again this is a personal reaction, by the idea put forward by Mr Legrange, that a study should be carried out to see how one could establish the right of the worker to be involved in decisions which would change his work pattern. This might be a specific role for works councils, for Comités d'entreprise. Finally there is the question of social reports for firms. Whether this should be something to be encouraged by the Community institutions or whether it should be a function for national action I do not know, but I do believe that this is a very important potential development. The idea that firms should carry out, and should be required to discuss with their works councils or with the appropriate social partners institutions, reports on their social achievements, their social prospects and perhaps their plans in the social area for several years ahead. This seems to me to come very close to the idea of the social audit which has been widely discussed and is beginning to be practised in a number of countries. John Humble who is here at the conference is a particular expert in the field in the context of the UK and perhaps he might like to say a few words about this aspect later on in our discussions this morning. This was a point that was also made by Miss Klein.

I have missed out, I know, a lot of the points that have been made by the rapporteurs but I do not want to pre-empt all the time of the discussion, so perhaps I could just conclude by saying that as regards the role of the Commission, perhaps the most useful part it can play is to try to act as a catalyst, as a cross-fertiliser. I believe we should not underrate the importance in this context of meetings of this kind. I think that in this field what one has to do is as somebody said, to create climates of opinion, and I believe that a great deal can be done in creating climates which will influence the decision makers through meetings of this kind, and that from this there could come - and this again is an idea that I think we should consider very carefully - what Miss Klein proposed, which is some kind of a declaration of intent with the social partners on what we feel the objectives of improving the humanisation of work in our Community should be.

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