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AUTHOR Delcourt, Jacques; Fusulier, Bernard; Debaty, Pol; Maroy, Christian

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ABSTRACT

Changes in the organization of work and production and in the management and structure of firms have an effect on the development of jobs and the segregation between certain trades and occupations. This macrocontext is a determining factor in the development of training and the acquisition of skill in Belgium. The Flemish region demonstrates the most positive results in terms of current economic, scientific, and technical restructuring; the situation in the Walloon and Brussels regions is decidedly less positive. Belgium has introduced alternance training for youth under age 18. Those over 18 have a wide choice in postsecondary training courses. Results of case studies of three companies in the Dutch community and two in the French community show considerable contrast between the two communities. Work remains very segmented, except at one company in the Dutch community where the division of labor seems to be more imaginative. The two companies in the French community show that division of labor according to work position has been abolished and there is a move toward versatility for the operations. An analysis of the findings indicates the following: the focus should be on forms of work organization that encourage work force training and skill development; planning and methodology are necessary to understand the complexities of the new training situations developing in businesses; and competencies acquired at the workplace should be recognized. (Contains 35 references.) (YLB)

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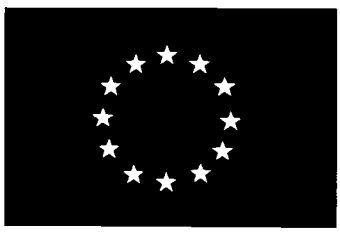

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Authors:
Jacques Delcourt
Bernard Fusulier
Department of Sociology/Institute of Work
Catholic University of Louvain

Pol Debaty
FOREM

in collaboration with
Christian Maroy
Department of Sociology/Institute of Work
Catholic University of Louvain

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Marinou Antipa 12, **GR-57001 Thessaloniki**
Tel. (30-31) 49 01 11; fax (30-31) 49 01 02
E-mail: info@cedefop.gr
Internet: http://www.cedefop.gr

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FOREWORD

Numerous continuing vocational training studies at both the national and Community level, especially those carried out by CEDEFOP on continuing training policy in large enterprises, have revealed the expanding role being played by enterprises in the development of human resources. This trend - which some see as heralding the emergence of a new division of responsibilities between those involved in training and production - undoubtedly calls into question their existing relationship and respective activities.

These studies also imply that, when it comes to strategies for developing human resources within enterprises, formally organized continuing training is only one of the options available for generating the "new" skills and competences considered necessary by enterprises. There are now organizational models geared to providing apprenticeship opportunities by exploiting the training impact of work situations, thus enabling a dialectic to be established between "formal apprenticeship" and "informal apprenticeship" (via work organization and cooperation between employees in the production and innovation process).

While they may make converging structural trends apparent, these new organizational models take on different forms and need not necessarily have any general application. The considerable difference between the contexts in which these models emerge means an analysis needs to be conducted of the relationship between an enterprise and its environment if there is to be an understanding of how the organizational models fit into the social context and what the scope and limitations are in a transfer of such models.

The primary objective of the present series of studies being undertaken by CEDEFOP in nine countries[1] is to establish the impact of developments in work organization on the skilling process and, more especially, to pinpoint the links between these developments and opportunities for formal and informal apprenticeships. These studies also enable light to be thrown on the nature of skills and competences which can emerge in the context of new types of organization and allow assumptions to be made about the impact of these developments on training systems.

A twin track analysis is pursued below. At the **macro level**, an attempt is made to "reposition the enterprise in the chain of skill generation" and to provide an interpretation of the mutual links between initial training, continuing training, the labour market and industrial relations. At the **micro level**, the aim - based on enterprise case studies - is to throw light on the various aspects of organizational innovation, developments in skills and the on-the-job apprenticeship process, in particular work-based and work-influenced forms of apprenticeship and how they relate to formal apprenticeships. In each country, enterprises were required to have a "marked and relatively stable level of organizational innovation" to qualify for case study selection.

The present report deals with both these aspects without necessarily looking at all the cases studied. These are the subject of an analysis examining how the macro level interacts with the micro level which is presented in the summary that concludes this report.

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1 Belgium, Denmark, France, Germany, Italy, the Netherlands, Portugal, Spain, United Kingdom

Finally, a cross-sectional analysis based on the national studies identifies the converging and diverging developments which emerge in relation to their social context, notes the impact of these developments on the training systems and raises questions in respect of social dialogue and training policy decisions. This analysis is the subject of the summary report on "The role of the enterprise in the generation of skills: the training impact of work organization", published in the CEDEFOP Document series.

Our warm thanks go to those responsible for the studies at the national level and to all the members of the research teams and companies involved in their successful conclusion.

Fernanda Oliveira Reis

Frédérique Rychener

PREFACE

The present publication only includes certain aspects of the work carried out in Belgium as part of CEDEFOP's European research programme entitled: "The company's role in the skilling process and the training impact of work organization". The complete theoretical and methodological arguments together with all the case studies and the results of analyses are contained in two research papers submitted to CEDEFOP in August 1992 in respect of companies in the French-speaking part of Belgium, and in December 1992 in respect of companies situated in the Dutch-speaking part of Belgium.

The following conducted the research:

The societal context	Jacques Delcourt (UCL) Marie-Pierre Seron (UCL)
Case studies in the Dutch-speaking community	Pol Debaty (FOREM) Claudine Tilkin (FOREM)
Case studies in the french-speaking community	Bernard Fusulier (UCL)
Scientific collaboration	Christian Maroy (UCL)

CONTENTS

INTRODUCTION

This study has been carried out for CEDEFOP in Berlin and is part of a European programme which aims to identify developing trends in the fields of education and vocational training from the point of view of national differences and common international characteristics and trends. However, the main focus is on the new approaches to training in businesses. In fact, when looking at the current socio-economic climate, firms seem to be playing an increasingly important role in the process of introducing, developing and reinforcing skills both as instigators and as trainers. It is evident that various changes (economic, technological, even cultural and social) are leading many firms to place more emphasis than in the past on the development of human resources, thereby providing not only a creative but also a learning and training environment.

This premise is of course borne out by the increased budgets and time which companies are devoting to continuing vocational training, and also the fact that trainers are now to be found on the permanent staff. However, over and above this direct and formalized investment in training, we are possibly also witnessing less obvious changes, not only from the point of view of the basic skills required, but also, and more particularly, through the channels that exist for the constant diffusion and development of knowledge and expertise. Seen in this light, our research which is based on heuristic principles, submits that there are close links between work organization which is anthropocentric in nature (in contrast to the characteristics of Taylorism and Fordism) and the acquisition of competences by workers in the course of their career.

Thus, CEDEFOP's main objective in carrying out this research is to define "the effects of changes in work organization on the development of skills and, in turn, to highlight the effects of these changes on initial training, by placing companies in their national context at social, economic and cultural level". In order to achieve this aim, it is necessary in each of the countries studied to employ a "wide-angle", macroscopic approach to the fields of education and training when examining their institutions and the people involved. This is the subject of Chapter 1. Thereafter, we will conduct a very close examination of concrete work situations, in particular those areas characterized by "distinct and relatively stable organizational innovation". With this objective in mind we change the register and the terms of analysis and take a detailed look at concrete situations in business.

Nevertheless, it is worth repeating that this study, initiated by CEDEFOP, is exploratory in character. The choice of case studies was based on businesses which appeared to demonstrate new patterns of production and progressive methods of work organization. As with any pilot study, our objective is to broaden ideas and refine methodology rather than prove facts in a definitive and conclusive way. In addition, this report forms part of a data base which is to be used for further research aimed at comparative analysis or based on particular problem areas.

In total six case studies were carried out in Belgium of which five will be presented in this report. The names of the companies have been disguised. In chapter 2 there is an analysis of three businesses which are considered to be "jewels" of the Belgian industrial economy. This analysis in at least two of the cases shows an organizational structure which retains characteristics of Taylorism/Fordism. Training, particularly at a formal level, is largely organized with the aim of filling the gaps between worker and work or available manpower and the job to be done. This does not take into account the identity of the workers or their personal strengths and weaknesses. In contrast, other case studies presented in chapter 3 show examples of firms where training has a clear-cut socializing function. In this connection, studies of two firms provide typical examples of an approach

which is reliable, flexible and varied and which is a hallmark of certain socio-organizational changes. These two cases also demonstrate the importance and the direction of training policy in this new productive structure. They also show how competences can be learned and passed on informally.

By examining the different approaches that companies adopt towards training, we are able to present our conclusions under four headings. Firstly, we focus on the forms of work organization which encourage the training and skilling of the workforce. This leads naturally to points two and three and ideas on the planning and methodology which are necessary in order to understand the complexities of the new "training" situations that are developing in businesses. Finally, we turn to the training effects of work and end this report by looking at the recognition given to competences acquired at the workplace.

PART ONE

NATIONAL STUDY

Jacques Delcourt

1. REMINDER ON FUNDAMENTAL INTERDEPENDENCE

Vocational training courses organized by companies must be seen within the overall context of the planning and funding of basic school education, initial training and in-house training courses, and even other training which is acquired externally to these areas.

Vocational training courses and skills which are taught through work also depend on the firm's employment and investment policies, on the pace and direction of economic development, on economic and industrial policies, scientific and technical progress and also on research and development policies.

Interdependence is therefore two-sided, with education and training systems together with their modes of funding on the one hand and companies and their systems of organization and methods of production on the other hand.

The link between training systems and production is inevitably accompanied by certain problems. In fact, economy and society are experiencing a highly paradoxical situation. While training appears to be increasingly necessary when looking for a job or indeed keeping it during the course of an employee's active life, we are at the same time experiencing staff reductions, the closure of many firms which seemed to have been modernized, the decline of various trades and occupations and a massive increase in unemployment and under-employment: it appears that these trends are continuing to escalate, despite forecasts over several years now that we are emerging from the crisis.

In view of the ups and downs of employment, we are faced not only with the critical problems of under-employment and unemployment but also with questions of training and acquiring skills. Indeed, in many cases, there is a clear increase in the level of skills required for obtaining and maintaining a job.

However, this interaction between systems of training and production is also part of another system, namely that of collective bargaining agreements on trades and occupations, on professional structures and classifications, on areas of training needed and on job descriptions. Changes in the organization of work and production, together with changes in the management and structure of firms have an effect on the development of jobs and the segregation between certain trades and occupations.

Chapter one therefore sets out to clarify this macrocontext which is a determining factor in the development of training and the acquisition of skills in Belgium. These areas of fundamental interdependence will be illustrated by means of examples.

2. THE EXTRANEOUS CHARACTER OF A MAJOR PART OF THE BELGIAN ECONOMY

From an economic point of view it should be remembered to what extent the Belgian economy is dependent on the world economy. Its import and export rates are among the highest in the world. More than 70% of its production is exported. The problems which stem from this state of affairs are all the more critical because Belgium produces no raw materials and has very few energy sources of its own. It is therefore one of the first countries to feel the effects of increased prices in basic materials. At the same time and perhaps because of this very dependence on the world economy, Belgium has made a name for itself through its activity and employment in the tertiary sector. However, despite this dependence, and salary and taxation levels which are relatively high compared with

other European countries and the rest of the world, Belgium has for several years now shown a positive balance of trade, but the question is, how long can this continue?

Belgium's dependence on the outside world continues to mean drastic restructuring of industry where it has been a question of moving swiftly from an economy based on the production of heavy, semi-finished goods to an economy producing more elaborate items. This has meant entering into complex engineering projects which require agreements for joint production and subcontraction and have thereby created a tightly woven mesh of interdependent companies.

The Belgian economy is also characterized by the level of foreign investment and foreign participation in Belgian companies. The transnationalization of companies and the increase in foreign investment over recent decades have had a destabilizing effect on the balance between the different regions. The Flemish-speaking area has received a disproportionate share of this foreign investment from, for example, the United States and some of the larger European countries like Germany. Walloon employers have been the most seriously affected by the crisis threatening the heavy sectors, and are finding themselves caught up in problems of redeployment. They only seem to have been able to get back on their feet with the help or support of certain large enterprises, that is, a few large French groups. The fact that so much foreign capital is invested in Belgium undoubtedly has an effect on how it is governed.

However, the Belgian economy needs to be continually adaptable not only in the face of problems brought about by competition but also those arising from the acceleration in scientific and technical development. These numerous economic, scientific, technical and also organizational changes as, for example, the introduction of production in cells and the concept of "just in time", require constant modernization of equipment and also extreme flexibility and appropriate investment in human resources.

When taking into account all these changes, it is evident why Belgium was one of the first countries to raise the school-leaving age in accordance with OECD recommendations, even though the wisdom of this measure has remained a subject for discussion ever since its introduction in 1983.

Developments and changes in industry also explain the high level of unemployment, even if some people say that the increase is, above all, the result of levels of unemployment benefit which they claim are too generous. Modernization also explains the numerous schemes designed to provide staff with continuing vocational training, retraining courses and training for the unemployed, both young and not so young. When taking into account these technological changes, the drastic restructuring of industry, unemployment which is becoming endemic, and the increase in the costs resulting from unemployment, it becomes clear that considerable sums of money need to be invested in the training of workers in a company in order to keep their skills up to date. Similar investment is required for training those applying for jobs, particularly those both young and older who have been out of work for a long period of time.

Because of the way they are presented, Belgian employment figures do not clearly show how many jobs need to be created or cut in order either to maintain or vary levels of employment. This is unfortunate because, while it is possible to calculate movements in unemployment figures accurately, it is only possible to guess and make approximations as to the movement, transfers and redeployment needed in order to maintain levels of employment. But, even if statistics for the active population were adjusted to show movement and balances, they would still give no indication of qualitative developments and, more particularly, the scale of effort required of the unemployed or workers undergoing re-training, bearing in mind that the levels of knowledge and competences demanded

when beginning or returning to a job are constantly increasing. However, the drop in the number of non-skilled jobs in industrial sectors and in the service industries is a good indicator.

At the present time the problems of redeployment are far more serious than during the "glorious thirties" since Belgium's demographic development and her economic specialization in basic products have led to the widespread employment of foreign labour.

In overall terms the three main regions which constitute Belgium (Flanders, Brussels and Walloon) are faced with the same problems, although on a differing scale. All are confronted with the growing difficulties of bringing young people onto the labour market. All are seeing a new wave of increased unemployment. All are faced with the urgent need of restructuring their means of production.

In the face of these crucial issues, the whole of the education and training system is put in the balance. Severe criticism is levied at all types of training whether general, technical or vocational, apparently because it does not deliver the goods at the point when the employee starts his job. Answers to the various problems which crop up after a student has left school or, in particular, technical and vocational colleges, are sought and found, but without any organized approach.

However, even if all the regions are faced with the same problems, they vary in gravity. What is more, the likelihood of finding solutions in the future is greater for some than for others. Thus it is difficult to understand what is happening in Belgium at various levels without recognizing that the regions have differing chances of development.

3. DIFFERING SITUATIONS ACCORDING TO REGION

On the whole the Flemish region can chalk up the most positive results in terms of current economic, scientific and technical restructuring. The situation in the Walloon and Brussels regions is decidedly less positive, in fact negative. There are various explanations for these interregional differences. Firstly, the demography of the Fleming region was less affected by the 40-45 war. Secondly, at the time of the 1973 crisis its economy was less dependent on basic and semi-finished products. In an economic climate where world trade is becoming increasingly important, its coastal position is of particular advantage: the three major Belgian ports are situated in Flanders (Antwerp, Ghent and Zeebrugge). This is a great bonus. As far as the Brussels region is concerned, its future no doubt lies in the tertiary sector. The capital, Brussels, is gradually becoming the main centre of the European Community. The future of the Walloon region is less assured. It is therefore apparent that the opportunities for economic development in the three regions are unequal.

In this connection, the period of revival seen at the end of the eighties and the beginning of the nineties provides good indicators. During this period there was a slight upturn in the number of people employed in industry in the Fleming region. In Brussels there was also a slight increase but industrial employment continued to fall back in the Walloon region. Even the tertiary sectors have seen a more rapid growth in Flanders than in the two other regions. This imbalance in the chances for development is aggravated by the fact that the linguistic frontier creates a major obstacle in geographic mobility for a large proportion of the French-speaking population and for foreigners moving from Brussels and the Walloon regions.

Therefore, on the employment front, the Walloons and the inhabitants of the Brussels region are seriously disadvantaged, even though overall statistics show that levels of

scholarity and qualification are proportionally higher in Brussels and in the Walloon regions than in Flanders.

The word "higher" refers to the level of the courses of study chosen in secondary education. Young people from the Brussels and the Walloon regions are more inclined to choose general and technical courses. More Flemings follow vocational courses. A similar state of affairs is also apparent in the choice of higher education, whether short or long courses, whether at a university or not: students from the Brussels and the Walloon regions also take their studies to a higher level. The same positive difference is confirmed among the unemployed and those looking for jobs in the Brussels and Walloon regions. It was in these areas that this market research was carried out. The survey shows that young people from these two regions are renewing their interest in vocational training and industrial trades. Student statistics over recent years also show a renewed increase in vocational study courses and a greater number of students entering higher, non-university education. It should be emphasized that these are real choices in as much as employment in industry continues to decline. The increased number of people choosing vocational training and also short courses in higher education may well be due to the restricted type of course followed by the children of immigrant workers who are numerous in schools in the city of Brussels and in those of the old Walloon industrial centres, as for example Liège and Charleroi. In fact, a certain number of the young foreign population are, more so than others, faced with failure at school just because of their linguistic disadvantage. This is a determining factor in their choice of occupation, that is to say, the way they drift into a particular training course.

4. CONTINUING VOCATIONAL TRAINING: A GROWTH AREA

Even if people hold clear views on the shortcomings of technical and vocational training, be it at secondary or higher level, conclusions are fragmented and uncoordinated.

It appears that at both secondary and post-secondary level, alternance training and employment is central to most initiatives and reforms, but no trouble has ben, to highlight the effects of these changes on initial training, by placing companies in their national context at social, economic and cultural level". In order to achieve this aim, it is necessary in each of the countries studied to employ a "wide-angle", macroscopic approach to the fields of education and training when examining their institutions and the people involved. This is the subject of Chapter 1. Thereafter, we will conduct a very close examination of concrete work situations, in particular even a social devaluation of these initiatives and their results either in the short or long term.

4.1 THE DEVELOPMENT OF PART-TIME SECONDARY EDUCATION

Since 1983, education in Belgium has been compulsory on a full-time basis up until the age of 16 and on a part-time basis until 18. As a result, technical and vocational training is to a large extent provided in school. This does not exclude occasional or regular collaboration with businesses, and dialogue with employers who may be requested to sit on panels which decide on the awarding of certificates. In contrast to the certificates awarded in technical training, those issued for vocational training do not entitle students to transfer to higher education unless they successfully complete a seventh vocational year.

Thus Belgium has chosen to provide training for those young people who are hoping to embark on a technical or vocational career within the school curriculum. Nowadays, however, a large number of people involved believe that alternance training/ employ-

ment is increasingly necessary because it solves numerous problems which become apparent at the time when school-leavers start to look for a job.

This is why a series of policies and arrangements have been introduced to promote alternance training and help young people move into an occupation. This type of training is also a logical development when seeking to fill gaps which are appearing in certain areas of the employment market, to correct the consequences of courses of study and qualifications which have proved too specialized for the outlets available, to compensate for training among workers which has been school-based and therefore too theoretical, to challenge training programmes which are unadapted to the rapid development in science and technology, and to alleviate the effects of a string of failures encountered by certain groups in society throughout their education.

Since 1983 it has been possible to comply with the law on school-leaving through the channel of part-time education which may begin at the age of 15 or 16 depending on previous results. This opportunity has led to the acceptance and testing of four possible methods of alternance training. They are presented below in order of importance.

Centres for Small Businesses

These training centres prepare students for self-employed work in the craft trades industry, commerce or small and medium-sized businesses. Theoretical training in the centres is combined with practical training which is acquired through an apprenticeship. Access to the course is by means of a basic school-leaving certificate and by successfully completing the second year of vocational education. A certificate of apprenticeship is awarded at the end of the training. It is not in itself a final qualification but it provides access to training as an employer. This course is also organized by the Centres for Small Businesses.

The CEFA's

Centres of education and alternance training are open to young people aged between 15 and 18 years and, by extension, to those aged between 18 and 25 if they have a contract of apprenticeship or have been given the opportunity to train as part of their job. These centres provide alternance training including a period of work experience, an arrangement for employment plus training or an arrangement for part-time employment. They offer technical and vocational training. Developed on an experimental basis since 1983, they have now received full recognition (decree of 3 July 1991). They are entitled, under certain conditions, to award certificates of qualification (CQ4 and CQ6 in technical and vocational subjects). They may act as a route to full-time secondary education.

Industrial apprenticeships

Industrial apprenticeships which were created by the law of 19 July 1983 are available to young people between the age of 16 and 18. They are curtailed because they must fit in with the law on compulsory part-time education. These contracts of apprenticeship are also of interest to young people aged between 18 and 21 years who are already working in a firm in the industrial sector (employing more than 50 people). Training is based on alternance training and is complementary to the work. According to the case, the contract may vary in length from between six months to a maximum of two years. The duration and the content of the training and the apprenticeship are laid down by a joint commission. Usually courses are provided by a CEFA. The certificate awarded at the end of the contract is not equivalent to a school-leaving certificate.

Social advancement courses

Social advancement courses are available to anyone who has passed the age for compulsory, full-time education. They are also available to young people between the age of 15 and 18 years who have either chosen or who are obliged to continue part-time education.

4.2 THE WIDE CHOICE IN POST-SECONDARY TRAINING COURSES

For over 18 year olds, in addition to higher or university education, we are seeing the development of a post-secondary system of vocational training, integration training and continuing training.

As we become more and more entrenched in the employment crisis, a number of initiatives have appeared which aim to train and help job applicants and the unemployed, whether young or older, beyond the compulsory school leaving age.

Social advancement courses

Although available to young people between the age of 15 and 18, it is mostly adults who benefit from this form of training. Social advancement training provides adults, whether unemployed or not, with a "second chance". It is also open to trainees of FOREM (Regional and Community Office for Vocational Training and Employment), ORBEM and VDAB (Flemish Vocational Training and Employment Office). In addition, it provides opportunities for qualified people seeking a complementary or more specialized qualification. The courses entitle trainees to paid leave for training purposes.

Training is the responsibility of schools belonging to different educational networks, both public and private, and is organized at specially arranged times (formerly as evening classes). This type of education has received a brand new status as a result of a decree on 16 April 1991. It now comes under the authority of the Ministries of Education, both French and Dutch speaking, and awards qualifications equivalent to those for day-time courses. The courses are modelled on full-time education classes, but more along the lines of secondary than higher education. However, probably its most important function is to organize short training courses with a view to responding to diverse needs for training and apprenticeship, along with modular training which is more suited to the needs of workers in commerce, or those individuals who have an urgent requirement for vocational retraining.

Social advancement courses are based on a system of credit units which can be accumulated. There are two different types of unit: on the one hand there are transition units which prepare the student for further study including higher education; and on the other hand there are qualification units which allow students to obtain a particular qualification while at the same time affording the possibility of continued study even in higher education. The flexibility of this path aims at producing new efficiency and at improving links with the employment market and other types of teaching.

Public training centres

Certain public bodies organize specific training. They consist of centres of accelerated training connected to the Ministry of Justice's prisons; training for senior mothers' helps at the Ministry of Health; training for farmers at the Ministry of Agriculture; training for ministry employees at the Ministry of Public Services.

Distance education

Since 1982 this has been the responsibility of the Dutch and French Communities. Distance education is regulated by a decree of 18 December 1984. It is particularly targeted at the adult population. There are various courses of study: training as a State juror, training in administration and continuing training for teachers.

FOREM training

FOREM helps the unemployed to find either their first or another job, it helps workers trying to maintain or improve their skills, it approaches firms which invest in training in order to keep pace with technological development or modernize their methods of production.

FOREM is undoubtedly the most important agency in the area of vocational training for young people and adults alike. Training may consist of the following:

- apprenticeship in a trade, occupation or post;
- updating and skilling in a trade, occupation or post;
- basic training required to carry out an occupation;
- improving and widening professional knowledge or the adaptation of that knowledge to the development of the trade, occupation or post;
- the observation of individuals involved in any of the above activities for a period of time long enough to ascertain his or her physical and intellectual aptitude and to determine the most suitable occupational path.

There are two ways in which FOREM becomes involved in continuing training: firstly, through management training centres or through collaboration with the business world, public authorities or public and private organizations which act as recognized centres; secondly, it subsidizes individual or group training in businesses or in technical and vocational establishments.

FOREM consists of three training sections (individual or group). Firstly, there are the reception centres and the centres for vocational guidance and occupational integration. They are open to the young unemployed, but during the course of time the intake has widened to include others. Secondly, there are centres for secondary training and finally those for the tertiary sector. Training courses are of varied length: they last from between a few days to sometimes several months, depending on the level of knowledge and skill at the outset. They may be organized on a full-time or part-time basis. FOREM awards final certificates of accreditation which have no official equivalent. Thus, for example, masons undergo training which is not recognized by businesses affiliated to the Federation of Builders.

FOREM also collaborates with the ILE (Local Employment Initiatives) and with the CPE (Upgrading and Employment Centres), bodies which were founded through regional collective bargaining agreements in some of the large towns in the Walloon region. On the whole, these courses are aimed at young people with qualifications who are entitled to unemployment benefit. During their training period they have the same status as that of an unemployed person who is receiving vocational training. The management boards of the CPE's are composed of representatives from the employers and the trade unions and also the French community. They do not award certification which has an official equivalent.

Training for "head of business" through the Centres for Small Businesses

This training prepares the individual for the management of a small or medium-sized business. It is open to people who have finished their apprenticeship and who wish to set up independently, to those holding a certificate of the second degree who passed with a good grade in their secondary education, and those who have a vocational certificate from the 6th year. A diploma which is recognized by the Executive Committee of the French community is awarded at the end of the course. The Institute for Small Businesses also organizes some continuing training and retraining in various areas (computing, new techniques etc.).

Other post-secondary training courses and continuing vocational training and integration training schemes

For some years now, initiatives in these areas, both public and private have abounded. It should be mentioned that one of the main reasons for this expansion, in addition to community and regional training programmes and the European Social Fund, was the creation of an Employment Fund. It was a result of inter-professional agreements made at the end of 1988 and renewed in 1990 and 1992. At the beginning, these agreements demanded a subsidy of 0.18% which was later raised to 0.25% with a view to promoting training courses. 0.10% of the 0.25% is compulsorily set aside for groups which are at risk. The most disadvantaged groups from an employment point of view are those who have been seeking employment for more than twelve months, those people receiving supplementary benefit, young people over 18 years of age who do not have a secondary school leaving certificate, young people who are forced to attend school on a part-time basis, the handicapped, people returning to the employment market (only under certain conditions), the unemployed with compensation benefit and workers who have been affected by group redundancy who are at least 50 years of age. The definition of groups at risk may be extended with the authorization of the Ministry of Employment and Work.

Initiatives from Professional Federations

Many of these initiatives saw the light of day at the end of the 70s and the beginning of the 80s, that is to say, well before the establishment of the Employment Fund. They are dependent on voluntary contributions from businesses. However, since 1983, a considerable proportion of the funding has come from arrangements provided by the system 5/3/3 (ministerial order of 30-12-83). In fact, certain sectors have managed to earmark part of the funds which were originally designated for training. The establishment of the Employment Fund and the development of agreements negotiated within the framework of this Fund are more recent developments. These agreements may be made with the A.S.B.L. Association, firms in the retail sector, agencies active within a sector or with public bodies. Different industrial and service sectors have proved particularly active in the area of adult training.

In the French community several different sectors of industry deserve a particular mention, for example, the FFPC (The National Confederation of Builders), IFPM (Fabrimétal) and the textile sector (CEFET/COBOT), the graphic arts sector and the chemical sector. For the most part, training in these areas is organized by joint bodies. This is the case, for example, in the construction sector where a joint body manages the training fund for builders. Apart from training, this fund is also used to motivate workers to enter manual trades, particularly those in heavy construction. A collaboration programme has been set up between FOREM and the French community with the aim of preparing courses, taking on trainees and retraining teachers.

Such initiatives are not confined to industrial sectors. Many sectors in the service industries, such as banking, insurance and distribution, have set up training centres.

Thanks to the Employment Fund, these industrial and service industry sectors have considerable financial means at their disposal.

Industrial apprenticeships (see memorandum)

Agreements on alternance training

The order of 31 December 1986, renewed by the law of 30 March 1987, and the order of 22 May 1987 provided for legislation on alternance training. It relates to young people aged between 18 and 25 years and aims for their integration into vocational occupations. These young people must have a fixed-term contract. The time they spend in the work situation, which must be at least part-time, added to the amount of time spent training, may not be more than that of a full-time job. It must be no more than 500 hours a year and not less than 256 hours for young people involved in the "head of business" training scheme organized by the Centres for Small Businesses.

A.S.B.L. Integration Associations

1) EAPs (Occupational Learning Centres)

Established in the 80s, these bodies organize both general and vocational training, where possible alternance training or training within the framework of businesses which act as intermediaries in as much as they have welding facilities, a workshop, or are involved in repair or servicing activities. The aim is to integrate or reintegrate an individual into an occupation by introducing him to a real working situation. The content of the training is very varied to accommodate a mixed public: it covers rehabilitation, basic learning (reading, writing and arithmetic) and vocational training (e.g. micro-computing and building renovation).

2) AID (Integrated Development Activities)

The AIDs are arrangements which operate in the same vein as EAPs. They are organized by the Christian Workers' Movement and are recognized by the ONEM as authorized centres of vocational training. We should also mention other initiatives such as FUNOC at Charleroi and local employment missions.

4.3 Some provisional remarks

During the course of the last twenty years, training opportunities, whether alternance training, work experience or training courses have increased considerably as have the agencies required to provide the training. However, the wide scope of these initiatives results in levels and types of training which are vastly varied. Certain types of training courses and alternance training are completely out of balance with courses which are more theoretical, while, in other cases, the theoretical, practical and work experience aspects are well coordinated. The quality of all these initiatives is extremely varied as are the results officially recognized by the organizing bodies. In the same way, the function and level of qualification of the trainers and group leaders is very mixed. Adequate qualifications are not always demanded by the training bodies. The young people taking part in courses are very different. Also, with the exception of social advancement courses, the certificates awarded are for attendance, with no further recognition or sign of official equivalence. When, at the end of a course, an assessment of ability is made, it is unoffi-

cial and without reference to other levels of training. Everything, therefore, is dependent on the quality and reputation of the training body.

If then, the strands of traditional secondary and higher education seem, on the whole, to be fairly coherent, the situation is completely different in all the new areas of post-secondary and continuing training. Initiatives are popping up in an uncontrolled, uncoordinated and disconnected way. Training cannot be seen as a part of a whole, nor is there any indication of the levels required in order to pass from one system to another in the search for training which has real value in terms of skills acquired and corresponding certification.

Indeed, many of these training courses are unlikely to lead to a job. They may promote employability, but they cannot stimulate employment, particularly in a period of crisis, such as society is experiencing today.

5. DEVELOPMENT OF THE LABOUR MARKET

5.1 SUMMARY OF THE MAIN TRENDS

The major trends in the development of the labour market are well known. As Robert TOLLET reminds us in his recently published "Assises de l'Emploi" (1992-1993), three processes are developing simultaneously: the workforce is becoming salaried, there are more and more women in employment and employment is moving into the tertiary sector. At the same time, three other developments can be analyzed:

- firstly, the increase in non-typical employment and under-employment;
- secondly, the reduction in the number of unskilled and semi-skilled jobs, but perhaps particularly jobs where people start as a labourer or a jack-of-all-trades in the hope of learning a skill on the job which will allow them to move on, that is to say, get onto the occupational ladder.
- and thirdly, the ageing of the active population.

Most of these developments are well known. The latter two, however, merit some commentary.

5.2 FROM SKILLS TO COMPETENCES AMONG OPERATORS

When trying briefly to describe the change in attitude brought about by current occupational and social developments, it is difficult to avoid falling into the intellectual trap of putting things into a nutshell. However, nowadays, as Philippe ZARIFIAN put it, we are moving from the idea that job specification and qualification are central, towards the idea that the worker has value and should be appreciated in terms of his knowledge and skills. In businesses we are seeing a move from skills to competences. The capacity that a firm or a worker has to offer training or an apprenticeship is becoming a central factor.

If we wish to understand what is happening on the labour market, within the systems of vocational training, both initial (at the start of a job) and continuing training, and also the relationship between the education system, the adult training system and businesses, we must analyze developments both in the area of skilling and in the harnessing of knowledge and competences.

Clearly, not all forms of work and division of labour are or can be equal in terms of the skills involved, as will be seen in the case studies. Even by constraint and in a turbulent environment, not every company will necessarily change its attitude towards training. However, faced with ever-increasing competition at both national and international level, with competition which affects variety and quality at least as much as prices, and under the impact of increasing technical and scientific development and under the pressure of constantly rising levels of school and college qualification presented by newcomers to business, we are seeing the introduction of a system of business organization and work production which is based on new forms of skilling and the development of worker training both within and outside businesses. More and more firms are founded on accumulated knowledge, the absorption of data and the assimilation of new technology, and focus on their creative functions (C.LEBAS,1993, pp. 8-9).

According to Mike PEDLER, a new pattern of organization is developing: "the learning business". This type of business encourages learning among all its members and is continually adapting to change in order to achieve its aims or strategic objectives. Such an organization relies on how well the staff can train themselves and, at the same time, seeks to develop a positive, collective attitude towards self training. A learning business is a business which sharpens its approach both inwardly and outwardly at the same time. This type of business view is based on the concept that its potential is generally under-utilized and under-developed.

Undoubtedly this model "learning business" does not exist in reality. Pedler concedes this point. It is a metaphoric expression, he writes, but it has a generating capacity in as much as it is capable of mobilizing forces, shaping ideas, and encouraging the will to change and to take concrete measures towards its realization (M.PEDLER, in B.NYTHAN, 1991, pp. 132-136 and p. 144). Some people believe that this is just a slogan.

What we are still seeing today are many changes which do not correspond to this pattern of business and work organization. Artificial forms of labour division are still introduced into forms of work organization which have retained traditional, cottage-industry or vocational lines. Dividing work up may, in itself, not necessarily imply a devaluation of skills, even if it often results in this.

Change may also consist of more advanced automation and computerization of the production line: this fundamentally changes the relationship between worker and material, and machine and product. In this instance, too, it is by no means certain that skills will be wasted since machines are only as intelligent as their operator or the work as a whole. Usually the two former types of development are accompanied by the installation of a production line if not mass production.

Yet change in an organization can mean that it shifts over from mass production which aims at economy of scale to a system of production that is supple with flexible specialization. The shift from mass to individual production is an answer to fierce competition during a period of slow growth, competition which makes increasing play on the variety and quality of products: this demands manufacture in batches or in small to medium-sized series. From a society centred on economy of scale, we are now slipping into another gear in the search for profitability in economy of range. From this stems the research into and development of new methods of production, new forms of work organization, new ways of involving and motivating workers and encouraging enthusiasm for a business plan which is based on a new business culture: a business in which management, training and the development of human resources become central functions and in which the relationship to the market, customer service and external influences are more important

than power struggles between workers and management, and where harmony replaces class consciousness and class struggle. Unconvinced, certain people, when confronted with new management philosophies and the new culture of participation, will remind us of the size of staff cuts as proof of the trap.

In any event, doubts and uncertainties prevail about something that could simply prove to be a new management discourse. It is true that in an economy as sophisticated and exposed as that of Belgium, major restructuring can only occur if there is constant adaptation of skills and massive retraining of often large numbers of workers. If they refuse training or do not follow it properly, they take the risk of losing their job. (Ph ZARIFIAN 1993, p. 179).

The fact that people are continually being shifted about in their job is aggravated by an ageing working population.

5.3 AN AGEING WORKING POPULATION

The ageing of the working population right up until the year 2015 is possibly the phenomenon that people are least aware of, and which until now has been least analyzed. Certain figures are available which help define the phenomenon and highlight one or two of its implications, particularly as far as continuing training and the need for restructuring are concerned. What is more, ageing of the working population is not just a problem specific to Belgium. It affects the whole of the European Community.

Since there are no precise statistics on age pyramids among the active population, giving separate figures as to whether employed or not, there is no choice but to consult statistics on the active population as a whole. In the tables shown below we shall compare the development of the population aged between 45 and 64 with those people aged between 25 and 44 years. From now until the year 2015 there will be an increasing number of people aged between 45 and 64 years compared to those aged between 25 and 44. Up until 2015, births registered from 1965 onwards will create a considerable ageing working population in all three regions of the country.

Since not enough is known about this trend, it is worth spending some time on the subject, particularly as rapid developments in science and technology are increasing the risk of occupational skills being outdated during the course of a working lifetime. In addition, it should be noted that in the case of continuing training for adults, many courses are only open to people under 45 years of age. It was not until the most recent occupational agreement signed in 1992, that specific reference was made to the need for regarding the over 50s as a group at risk and consequently a target group.

In order to adapt rapidly to changing economic, scientific and technical demands, we have, since the post-war boom, been able to rely on a massive influx of newly-qualified people and, consequently, on adaptable methods of production in both the public and private sectors. Up until now, in order to cope with the effects of out-dated skills among the older working population, brought about by rapid developments in science and technology, we have chosen to offer them retirement or early retirement. The drop in the birth rate since 1965, no longer affords the possibility of replacing under-qualified, ageing workers with young ones, even if many of them are the product of higher education. In future, because of insufficient numbers of new, skilled workers at the base of the professional pyramid and on the labour market, it will be necessary to evolve ways of adapting and retraining older workers so that they can remain in jobs.

Table 1: Regional distribution of the total population aged between 25 and 44 years, and 45 and 64 years, from 1990 to 2015

Total population aged between 25 and 44 years, and 45 and 64 years, in the Fleming region

Ages	1990	1993	1995	2000	2005	2010	2015
25-44	1,737,038	1,759,692	1,758,322	1,657,261	1,596,266	1,462,789	1,354,727
%	100.0	101.3	101.2	95.4	91.8	84.2	78.0
45-64	1,321,803	1,345,907	1,364,697	1,410,595	1,505,637	1,633,642	1,652,764
%	100.0	101.8	103.2	106.7	113.9	123.6	125.0
25-64	3,058,841	3,105,599	3,123,019	3,067,856	3,101,903	3,196,431	3,007,431
%	100.0	101.5	102.1	100.3	101.4	101.2	98.3

Total population aged between 25 and 44, and 45 and 64, in the Brussels region

Ages	1990	1993	1995	2000	2005	2010	2015
25-44	296,581	303,844	304,405	298,368	281,070	261,669	253,395
%	100.0	102.4	102.6	100.6	94.8	88.2	85.4
45-64	216,617	219,566	223,283	238,063	264,918	295,430	302,351
%	100.0	101.4	103.1	109.9	122.3	136.4	139.6
25-64	513,198	523,410	527,688	536,431	545,988	557,009	555,746
%	100.0	102.0	102.8	104.5	106.4	108.5	108.3

Total population aged between 25 and 44, and 45 and 64, in the Walloon region

Ages	1990	1993	1995	2000	2005	2010	2015
25-44	964,227	968,725	960,832	940,259	886,534	830,397	790,459
%	100.0	100.5	99.6	97.5	91.9	86.1	82.0
45-64	706,198	710,960	724,509	762,899	826,972	900,403	899,270
%	100.0	100.7	102.6	108.0	117.1	127.5	127.3
25-64	1,670,425	1,679,685	1,685,341	1,703,158	1,713,506	1,730,800	1,689,729
%	100.0	100.6	100.9	102.0	102.6	103.6	101.2

Source: Data taken from "Perspectives de population 1988-2040", INS 1989

6. THE DEVELOPMENT OF COMPETENCES: A MAJOR SOCIAL GAMBLE

In the face of developments and changes at economic, scientific and technical level, there are two possible ways forward. One is where competition centres on prices. Firms become mechanized, automated, computerized and are basically involved in economy of scale, standardization of the product and rationalization of the business and the workload. Where employment is concerned, emphasis is on numeric flexibility, staff cut backs, the external employment market and pressure to keep salaries down. Training is thus a minor preoccupation within the business. The other is where competition is based on variety and quality. Emphasis is on economy of range and choice. Difference is important. New niches in the market are sought. The key words are, flexible specialization, decentralization of management, flexible methods of production and a staff policy which remains adaptable through continual upgrading of skills. This implies training initiatives, encouraging skilling, motivating and involving workers, and undoubtedly explains why new skill-based business forms are springing up.

In reality, situations are never that clear cut. Many battles are still being fought. Many trade unions are still combatting staff reductions. Concern over employment, the struggle against work exclusion and against endemic unemployment and exclusion from the labour market are forcing social departments to focus on the problems of redeployment and, particularly, on training needs for job applicants. Throughout the employment crisis, unions have therefore come to concentrate on the problems of training outside business, thereby often leaving the field clear for employer training initiatives and apprenticeships either within the business or through training courses which they have organized.

Under the present circumstances, however, it is no longer enough just to concentrate on initial training in school or even on harmonizing the various strands (school and post-school) of training which take place outside the workplace, or in fact contemplate where all this may lead. What is needed today is a better idea of what is going on in firms in terms of training both on and off the job. In line with this thinking, it is clear why many businesses have nominated a department or director responsible for the development of human resources.

PART TWO

CASE STUDIES

The Dutch community:	**Pol Debaty**
The French community:	
Lighting Belgique:	**Bernard Fusulier in collaboration with Christian Maroy**
S.B. Belgique:	**Bernard Fusulier**

1. THE COMPANIES STUDIED

In commissioning this research, CEDEFOP's requirements were for a critical approach with adequate contrast in the case studies. Consequently, it was their wish for companies to be selected which differed according to two criteria: firstly, their geographic exposure (either national or multinational); secondly, their size (one small or medium-sized business was requested).

However, the three companies presented are multinationals which, even within Belgium, assume the form of groups of subsidiaries, some even having the appearance of sub-contractors appointed by other companies. We draw attention to this well-known fact because the three companies have subsidiaries in each language region: Flanders in the north; Walloon in the south; and Brussels in the central area.

Because Belgium consists of communities which are divided into different territories with different languages and different characteristics, the third criterion laid down by those who initiated the study, was that three of the companies should be situated within the Flemish Community and three within the French Community (cf. chapter 3 which finally, however, only included two). It is, in fact, interesting to ponder the influences of regional culture on the way businesses are organized and apprenticeships are handled. Nevertheless, due to the fact that our examples are unrepresentative, we would prefer not to draw conclusions from our current findings on this subject, as total objectivity could not be guaranteed.

1.1 THE "FLEMISH" STYLE OF BUSINESS

Setting up a multinational company in Belgium has always been beset with accompanying political problems. In fact, since the beginning of the sixties right up until the present time, the communes, provinces and also the regions have helped companies to become established on their territory with a view to promoting employment and benefiting from the economic advantages (sub-contraction, land development, access to certain grants,..).

For a long time now, one of the main criteria, when choosing in which country or in which region to set up a business, has been the availability of a skilled workforce, or the possibility of training workers rapidly thanks to a flexible training system. This is only relevant to Belgium in as much as linguistic aspects have assumed a new dimension at the expense of policies on regionalization, bearing in mind that employment and the economy are the responsibility of the regions.

"Padaire" is of Dutch origin, although nowadays it is to be found all over the world. In Belgium, its presence has always been an advantage to the Dutch-speaking region of the country and the French-speaking areas near Brussels. Currently, it is being restructured according to a "portfolio" decided at international level which foresees jobs being moved towards English-speaking countries or Latin America. Obviously these countries, where salaries are lower or where the population can be mobilized into mass production, are attractive when firms are in the process of restructuring. Discussions have been held in French, in Dutch and in English. In the production areas the working language is Dutch.

"Chocolate" was taken over by the multinational Padaire Morris only a short time ago. The Halle branch was previously in Brussels (Chocolate) where it was run entirely as a family firm. Most of the staff moved with the production to the Dutch-speaking outskirts of Brussels. The industrial estates, which became attractive because of their proximity to the capital, their communications facilities and also the economic conditions made available to new investors by the Flemish region and represented by the Suchard shareholding, have become important centres of activity. Meetings were held in French and in English. The directors to whom we spoke are international managers. In the production areas, people are signed on in Dutch, but many languages are spoken which reflect the presence of numerous immigrant workers from the South.

Although of American origin, Sudcases moved to Audenarde 35 years ago and has grown up independently as a true small to medium-sized business with a real local character because of the labour employed from the surrounding district. Recruitment and promotion policy favour senior employees, the Audenarde subsidiary having its own traditions. All contacts are made within the local Flemish context, in an informal fashion which is quite different from what is normally found in an international company.

1.2 MULTINATIONAL AND SMALL TO MEDIUM-SIZED BUSINESS

This is a general characteristic of the companies we studied. Whether very large or not so large, the basic work unit has remained personal even if it is part of a much larger whole. This is no doubt due to the type of product on the production lines. Regardless of which company, the article it produces is something that the employee understands which he uses himself (a suitcase, a bar of chocolate, an electric light bulb). Even if he does not understand or if he has no access to the fundamental production procedures, he knows exactly what part he plays in the whole, however limited it may be.

2. THE "CHOCOLATE" CASE

The Chocolate company is part of a multinational which has three divisions in Belgium (Herentals - Halle - Liège). Production is considerable within the chocolate and confectionery sector with a turnover of 14 thousand million Belgian francs in 1991. The personnel numbers between 2,000 and 2,500 of whom there are some 450 workers (known as operators) at Halle, in addition to 350 employees and managers.

The manufacturing department is divided into relatively static production lines as far as both the functioning system and the personnel working at different highly automated machines are concerned (distribution of the product, moulding, wrapping, packaging). At Halle there are the three parts of one division: the production centre, the international manufacturing centre (IMC) and the commercial unit (sales and marketing).

Here we are essentially looking at the manufacturing centre, since the other areas belong to the tertiary sector and have their own characteristics. The same production line can produce 12 different products but not all at the same time: one week one product, and the next week another product. A production foreman is responsible for one production line. In general, this is an industrial engineer (foreman). All the workers, both male and female, do practically the same job on the production line. Since everything is automated, workers only intervene in the case of minor problems which can be solved within a few minutes. This is the only thing they have to do. If anything more serious happens, they call in a maintenance and repair team. There is no interface between the production lines; the teams on each line are very specialized and consist of workers who may have as much as 15 to 20 years experience and who work in an amazing way (comments the

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training manager). Although movement between the production lines is minimal, it is common within the line itself, each operator having the possibility of changing his work position, depending on circumstances. This is known as versatility.

2.1 FORMAL TRAINING

- A training budget is fixed by the directors (not in Belgium). The Halle division has a budget of 10 million in order to finance the training initiatives which it decides. Payment for working hours spent in a "formal" training environment is covered by a budget for each department.

- Once the budget has been decided the person responsible for training has carte blanche to use it as he wishes.

- Training requests submitted by the personnel (or management) are informal. Completion of a form is all that is required. There are many different requests. They cover various areas such as computing and languages. If the request is complicated it can be made directly to the training manager who has an "open door" policy.

- At particular times (once a year), members of staff are assessed by their immediate superior. During the meeting, training needs are discussed. Answers to these needs are attached to the results of the assessment.

- Certain suggestions will have a collective response; others will be of a more individual nature, using the "form" system. The agreement of the training manager is, however, secondary to the interests of the department and costs.

- All the suggestions which are "accepted" are organized into training programmes which define the requirements (consultants chosen by means of a register, data base Socrates), the budgets available in the various departments to cover the salaries of those on training courses and the possible need to invite experts to give technical training in order to update personnel when technological changes occur.

- There is no particular follow-up during training.

- At the end of training another form is used to collect the "trainees'" evaluation and appreciation from the point of view of the standard of the training and how it corresponded to original expectations. The training manager uses these assessments when making future choices.

- Six months after the training course there is a follow up which establishes how useful the training has been.

- Certain technical training courses which are not planned within the training programmes, are necessary because of unforeseen technological innovations. They are generally organized by a training company (budgets, trainers and programmes).

- For both management and employees training may go beyond the technical sphere and become "social" in nature. In this case, subsequent evaluation of trainees is largely to ascertain whether the training course should be repeated.

In conclusion, organization is relaxed and, if we exclude technical training which is required for this type of production, we found that people were happy at their work and have the breathing space necessary to heal the psychological, physical and social damage caused by a production line which is indifferent to the lives of its operators.

2.2 INFORMAL TRAINING - THE SUPERVISOR

Production lines must always be supervised. Be it for the 15 minutes when someone needs to go outside or the 45-minute lunch break, a special worker has been appointed to take over the job. This person goes from one position to the next (even though they are almost identical), knows everyone, and is available most of the time for matters other than production. This is the female supervisor. We have said "female" because this is how the function is represented in the system. The role interfaces between the production foremen (the logic is: engineer=work= productivity=money) and the rest of the workers.

This person is part of the production line but also has other functions.

- The supervisor is the person closest to the workers. She knows all their problems, including their personal problems, and helps to deal with them. She operates at a social level among the production lines.

- The supervisor, together with the production foreman, identifies needs for technical training.

- The supervisor is the link between the production foreman (at a formal level) and the fragmented and temporary jobs carried out by the more senior workers which are sometimes briefly interrupted by maintenance teams (maintenance is carried out during standstill times and when the workers are absent); she is the link between human resources and technical production. She is the human factor.

2.3 STUDY OF THE SOCIAL CLIMATE

Social aspects appear for the first time when using the word "climate". There was an initial problem when salesmen and other people from Marketing, who are geographically and mentally separated from production, expressed the wish to be looked after by a proper "Human Relations" department. This was done. Problems among the workforce are also complicated by requests from staff in the Maintenance and Repair departments (selection, salaries, job descriptions, task assessment).

- An external consultant was recently requested to carry out a survey on the "social climate" among employees and management. This pointed to the fact that employees feel they are not progressing within the company and would like to see a clearer career path (obviously in terms of salary, but also in terms of autonomy and responsibility). A similar study is to be carried out among the workers, this time internally, by the training department, which will follow the methodology and techniques learned from the consultant.

- It is difficult to describe the exact nature of the social climate in the production area, that is, to differentiate between what already exists and what is desired. One thing is definite, and that is the endeavour among all levels of management to develop the individual's interest in his own work, in the work of others and in the smooth running of the company. This is reflected in discussions and also in the way the Human Re-

sources department keeps a continual assessment for each individual which has an influence on work organization and recognition of results and also salaries. Indeed, among the criteria of assessment, we find "personal investment in work" (stagnatie is achteruitgaan = to stand still is to fall backwards) and also ("taakverrijking is niet genoeg" = to make tasks more interesting is not enough).

3. THE "PADAIRE" CASE

3.1 DESCRIPTION OF THE COMPANY

The multinational "PADAIRE" is known throughout the world and has a presence in most markets including the employment market. In Dutch-speaking Belgium, its proximity to the Dutch border and the parent company has encouraged the establishment of a number of subsidiaries geared towards particular products which have been developed as a result of new technology: electronics, computing and telecommunications. Padaire is one of these subsidiaries which specializes in the manufacture of light bulbs, and components destined for other subsidiaries or departments within the same company.

Since October 1990 the multinational has been the subject of a major reorganization which has caused it to rethink its priorities and redistribute its means. This operation has been described quite simply: "How to work better and produce more with fewer employees". Solutions proposed range from specialization to worker versatility.

Padaire's production consists, on the one hand, of the metal components contained in bulbs and, on the other hand, of the bulbs themselves (glasswork). Production still requires a number of human skills (provided by craftsmen). Indeed, automation is not always appropriate for technical or economic reasons (specific products or short series).

Padaire has a long tradition in the area of "manual training". This type of training encourages the acquisition of knowledge which becomes a routine and thus an integral part of the process of quality production, affecting even the larger lines.

The training method used is demonstration training (from hand to head). The instructor demonstrates and the pupil does the same thing. All this pre-supposes relatively long learning periods in order to reach a level, which, in time, can be raised through endeavour. The introduction of a method of pre-apprenticeship enables trainees to reach a "routine" level more quickly in both qualitative and quantitative terms.

The "Leittexte" method was developed in Germany (Daimler- Benz, Ford, Siemens) in order to help companies provide training under the Dual system. The objectives of the method are: to train workers to be responsible and flexible and oriented towards solving problems which arise when following work plans.

INFORM --> PLAN —> DECIDE > DEVELOP --> CHECK —> ASSESS --> INFORM

1. What must I do? Fundamental question
2. How do I do it? Work plan
3. Production lines and difficulties in carrying out the work. Decide what they are
4. Prepare the production units. Define the orders
5. Has the work been carried out in accordance with central control?
6. What can be improved? Discussion with the head of production

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There are important differences between this new method and the demonstration method: In the old method, the instructor leads and the pupil follows. In the new method, the instructor asks questions and the pupil thinks. In the old method, instruction is based on the instructor's activity. In the new method, the pupil relies on his own activity. The new method is based on a series of attempts and errors corrected by sudden understanding made possible by choice of method (American insight becomes l'inzicht néerlandais).

We have emphasized this methodology which is connected to the major principles of reorganization taking place, because it explains a number of very real observations in our study and indications for the future which, however, can only be verified later.

Situations arising now and in the future are therefore not arbitrary, but the result of the explicit wishes of the managers of the company at world level. This is no doubt the meaning of the last sentence of a management document explaining the changes: "We are changing more than just one procedure..."

3.2 THE ORGANIZATION OF A PRODUCTION LINE

A production cell operates in three shifts (3 x 8 hours), that is, continuously. Each team of operators consists of a variable number of workers depending on the product. More people are involved in the case of **mass production** (new, current trend) or diversified production (previous and current trend).

The cell is led by the production foreman (an engineer) supported in a certain number of tasks by an instructor who is a selected and trained operator.

The introduction of a **new product** is organized by a processing engineer from the "Research and Development" department. He helps the production foreman while the production system is being set up and also with the **initial** training of the **operators.** These processing engineers tend to become confused with the research engineers. The latter who are the inventors, have always been regarded as the cream of the company.

In addition to the processing engineer, the production foreman is assisted by the engineer from the Maintenance department, the engineer from the Quality Control department, the head of Personnel (also an engineer) and the engineer from the Organization and Efficiency department.

In addition to personnel from these different departments, the production foreman is also assisted by instructors from the Training department who are not engineers. The current trend is to regroup the Training and the Organization departments.

All these engineers are "on the ground" personnel. Apart from Research and Development engineers, they are all considered to be part of the production area. In fact they are seldom there and the instructors stand in for them in their absence alongside the workers assuming tasks which are the responsibility of the production foremen.

The training department is essentially attached to the production lines. The Personnel department remains responsible for everything connected with the individual training of the workers.

As far as salaries are concerned, it is strange to note that the production foremen, who are themselves engineers, are paid less than the engineers who work around them in the areas of research, maintenance, control, organization and personnel.

3.3 FORMAL TRAINING

In addition to the "Leittexte" method described above which is particularly aimed at training operators in the production process, there are numerous training courses at all levels with very different objectives: for example, languages and computing. These are organized by the Personnel department which sub-contracts the courses or employs outside bodies depending on how many people are interested. In turn, this department can sell its own training programmes and facilities to outside clients, thus acting as a training organization.

3.4 CONTINUAL ASSESSMENT

Padaire is a company of researchers. History has proved it. Everyone, from the top down to the level of the most basic operator, is required to have a creative mind, to take pride in total quality, to show initiative. Up until now the staff have been recruited with this in mind and, to a large extent, assessed according to these criteria. In order to do this, the line foreman must be aware of the needs of the workers on his line and respond to them using the various means at his disposal. The line foreman is the person responsible for the "training/assessment" of his staff.

Current developments favour a distinction between foremen for mass production and foremen for diversified production. The former will have to manage production lines where respect for fixed norms will outweigh any spirit of initiative, and will give way to routine with the need for motivation to maintain quality.

These changes explain the integration that is taking place in the Organization and Efficiency, and Training departments. Indeed, the former has the annoying habit of forgetting that every change implies the need for other competences.

3.5 HEAD AND ARMS

Taylor is always present. Up until now engineers have foreseen the need for particular standards, thus leading them to introduce numerous and costly correction systems which, to a large extent, removed responsibility from the operators, who knew that someone somewhere was correcting their mistakes. Now workers are expected to work intelligently, no longer waiting for confirmation and correction at the end of production. It is certain that the selection of future workers will be based on this new quality-linked criterion.

In this company, quality circles have met with a good deal of success. This can be seen by the large number of notices in the corridors. Up until now quality circles have themselves chosen the subjects to have put on the agenda (hence the problem of introspection). Now, certain subjects relating to the company's objectives are imposed by the management, as in the case of the commercial aspects of production ("You must sell what you have produced").

4. THE "SUDCASES" Case

Sudcases of Audenaarde is a multinational company which specializes in the manufacture of suitcases and other luggage. At Audenaarde, the articles manufactured are rigid, at Torhout, also in Flanders, the factory specializes in soft products (bags, etc.). There are other factories in France, Spain and Italy. Over the last two years, new subsidiaries have

sprung up in Hungary and in Bulgaria (attraction of lower salaries). Projects in Czechoslovakia and Russia are at the planning stage.

The company at Audenaarde employs 780 workers and 180 employees. This is more than the other Belgium subsidiaries where the trend is towards redundancies (transfer towards East European countries).

The spokesman for the company is responsible for the workers and supervisors. He is a young man (35 years old) who has been working in the company for 8 years (previously in charge of payroll). He sees himself as an all-round personnel manager (not only dealing with administration, but also closely involved with the staff: recruitment and assessment).

4.1 THE PRODUCT

At the present time, various trends are apparent. There are increasing numbers of customers, but they are younger, not so well off, and less conservative in their tastes. The demand for solid, expensive products is giving way to products which are less durable, more varied and which are less complicated and cheaper to produce. What is needed, therefore, is a wide variety of different products. This requires shorter series and greater flexibility from workers at their work positions.

4.2 THE PRODUCTION LINE

The changeover from long lines of sophisticated products to shorter or mixed lines, requiring a variety of materials, has raised questions among the operators who have been working on the same line for a long time. In particular, the line foreman feels that he is now not only required to manage the line, but is also responsible for changes.

More specifically, it is his job to explain new processes to the operators, both in terms of the materials and the methods used. This new teaching role was defined in advance and specific training was provided. All this has shaken up work organization and has led to the introduction of working "cells".

4.3 THE CELLS

In the past, work was organized in chains or groups, with each worker dependent on the others. Production was carried out in long, identical series (we recall the brief cases in hard plastic with stainless steel clasps). It was monotonous, stressful work, giving little satisfaction, with each article identical to the rest. This resulted in low paid work which in turn led to low productivity. Each worker had minimum responsibility.

Work in cells, however, defines each worker's responsibility within the production process ("the maker" of the case will lend his name to the finished article). He works at his own pace, but must adapt to different products, different component parts (sometimes unique), to new machinery, and must organize his work accordingly. He is better paid and more productive. He draws more satisfaction from his work and has less stress.

The advantage for older workers is particularly evident as the work pace imposed by younger workers was too fast for them. In the cell their experience is used by the group as a whole and they share out the work accordingly. Only the time spent on the job is not shared out equally. Indeed, once he has finished his required number of products, the

worker may leave the work position while the others remain in order to complete production.

If we base our comments on the statements made by the personnel interviewed during a visit to a cell with three workers, it can be said that the relationship between the workers' sense of "responsibility" and the quality of the finished product is extremely positive, in comparison with the anonymity of the chain which was a source of worry and stress.

4.4 RECRUITMENT

The company's profile in the region where it is was established 25 years ago, is that of a large family business where everyone knows each other. It is interesting that every new vacancy is first announced to the staff to encourage applications from other members of their family or at least a friend.

Recruitment is essentially based on an interview with the person in charge of human resources and on psychotechnical tests. Once selected, the worker is invited for an introductory day (general information and a visit to the factory) where he comes into direct contact with the line foreman with whom he would be working. At the end of this first day the line foreman decides whether or not the operator is suitable. If so, the operator will return the following day to make contact with the personnel department where he will be "welcomed into his new family". People are only recruited at operator level.

Thus a new line foreman will be an operator who has been promoted to this position and who has already been part of the company for a certain length of time. This kind of promotion does not require any particular procedure. The main criterion for selection is aptitude for change, and a constantly flexible attitude towards products, methods and new organization.

4.5 FORMAL TRAINING

The personnel manager considers that investment in the staff is as important as investment in machinery. However, there is hardly any specific, formal training apart from occasional courses for executives and management. Nevertheless, anyone can ask to take part in particular training, but since there is no budget set aside and no-one designated to take charge of such an area, it is a case of necessity knows no law.

4.6 THE ENGINEERS

A large group of engineers work in the engineering, development and computing sections. Working methods are perfected in these sections and are then explained to the "plant director" whose job it is to transmit them to the production lines. This group is in direct contact with the other subsidiaries from which it receives data which it adapts for general use.

The main problem arises at the point where the line foremen have to pass on information to the operators. Indeed, the line foremen, having been promoted from the shop floor, were not selected for the training role which their job now requires of them. For this reason, a supervisor's training course, spread over four years has been sub-contracted to the V.D.A.B. with the aim of teaching line foremen how to pass on their knowledge to the operators. It is basically a question of "translating" a message, which is fundamentally theoretical, from the engineers to the factory foreman (promoted from the shop floor), into

concrete terms for the line foremen. The fundamental objective is flexibility, which is required at two levels: firstly, that line foremen should be capable of understanding a theoretical message which has been made concrete, and secondly, that operators should be able to apply it with an open mind. This whole process is only possible in a climate where there is dialogue.

4.7 SOCIAL DIALOGUE

First of all, it must be emphasized that when talking about dialogue in the company, it in no way implies a dialogue between the social partners (employers-trade unions), but a direct contact between the management (including the Director) and the operators. Initial contact stems essentially from the desire to continue recruiting from the same social environment which is still characterized by traditional working structures. People know one another, respect one another and talk among themselves.

In the work situation, each line foreman knows everyone's capabilities and at which level there needs to be most control and where improvement is possible. On-the-job training is present in all these passing contacts where there is always an element of training, however low key. This method has given rise to a very special company culture. As part of the company, the new worker and his family have access to sports clubs and other free-time activities.

However, the demands made by a wide variety of products, the need to place workers in jobs which require repeated training periods (between 2 weeks and a month), working in smaller-sized cells with different colleagues, all this implies constant adaptation to changing methods of production.

A permanent dialogue between the person in charge and the operator can no longer rely on arbitrary meetings even if they are frequent. The learning process must be accelerated and the line foremen and factory foreman must be made aware of the educational importance of these dialogues. There is no doubt why the formal training of these employees has been spread over a long period of 4 years.

It is evident to what extent this desire to communicate at all levels is part of a strategy of investment in human resources, when you hear that "even the Deputy Director often visits the factory floor to talk to the workers in order to find out about their everyday problems".

4.8 CONCLUSIONS

In 1992 the Managing Director of Sudcases Europe was nominated "Boss of the Year" as a result of his policies on human resources which he developed within the general framework of total quality and in the specific context of "Sudcases". The Personnel Director, when interviewed, commented that this philosophy was not only translated into words but also into actions. Thus, these networks of informal communication are found to operate both through the formal channels of the business plan and the social contacts established by the "Sudcases family". This institutional dialogue will be the subject of our investigation in the comparisons which follow.

5. SIMILARITIES AND DIFFERENCES BETWEEN THE COMPANIES

5.1 SKILLED WORK

Skilled work leaves its mark in the memory, in movements and in a person's sensitivity. As a first principle, it must be said that a machine can only be as sophisticated as the operator is competent at following particular routines. We can find a clear example when comparing operators from the three companies:

- At **Chocolate** it may be a question of supervising and checking a production line. The operator's skill is in his eye, his nose, his ear, perhaps even his mouth, which, over a period of time, have become adept at detecting abnormalities and correcting them with a simple movement. Over and above a certain level of abnormality, the operator is incompetent and has to call in a specialized team. Machinery changes, products change but the operator's skills remain the same. Knowledge and training never exceed the limited needs required by new techniques and met through the brief assistance of the supervisor.

- At **Padaire**, when the machine no longer plays the main role in the production process, the operator assumes a unique position in the line. He becomes as much as an eye, a nose, a mouth (particularly at certain positions) as a hand, capable of carrying out precise movements repeated a thousand times over. His training is the result of trial and error. The training period may be shortened by simulation outside the production system. The operators we met are the result of an unremitting selection process which left everything to be desired apart from the result. As soon as another period of mass production is planned, the machine resumes its role and the operator finds himself back where he was.

- At **Sudcases**, the machine, however sophisticated, becomes a tool in the production line, secondary to the operator who acts as an eye and a hand that think. Often actions are simple. However, the objective of training is no longer achieving perfection of coordinated movements but the capacity to make judgements when assembling parts, weighing up the effort and time required, finding beauty in the finished product even if the pattern is prescribed.

It is likely that in other companies we may have encountered examples which lie between the two extremes. However, these cases do have certain things in common: All the operators were unskilled at the outset; training was acquired on the production line. Their eye, their agile hand, their critical judgement are specifically trained for the job. Learning these skills is part of a "general, initial education".

What value does this training have outside the production line where it has particular relevance? The relationship between men and machines is ambiguous. As soon as a machine can replace a human, it eliminates him without hesitation (a current example is the restructuring of Padaire). As soon as the human dimension regains the upper hand in terms of the skill required, the production process is organized so that this dimension can find expression.

5.2 FROM CONCEPT TO FINISH PRODUCT - DEVELOPMENT OF STRATEGY

Companies where the operators, or rather workers, are chosen on the strength of qualification are rare. The three cases shown here are not in this category. They all operate according to the same fundamental plan: engineers and highly trained technicians think

up a product which may be more or less sophisticated (this is not to say that a halogen light bulb is fundamentally more sophisticated than one of Chocolate's almond truffle bars.). Together with other engineers who create the machinery, they describe the stages and the various production methods. Once the production lines are prepared, they must be made to function using personnel who have no understanding of the product or the means of producing it. From this point on, we can observe the development of a strategy aimed at convincing these workers, who are in the majority within the company, that the quality and therefore the success of the product on the market is their responsibility, and sometimes this really is the case.

- It certainly holds true in the example of the company **Sudcases** where diversification of the product leads to the personalization of the operator (or the cell), who in a certain way put their own hallmark on their work.

- This is certainly not the case at **Chocolate** where everyone on the same production line is interchangeable and where the supervisor replaces each individual during the lunch break or for short periods of absence.

- This was the case in the third company, **Padaire**, but in changing times an open battle has broken out against this policy because training the operator increases production costs to the detriment of the company's competitiveness in the market, and now a return to the previous situation, where the operator is anonymous, is again being promoted.

This duality between the production and the design departments (always linked to production organization) creates a gulf between them which the companies overcome by employing line foremen, factory supervisors, line supervisors and instructors, all promoted from the factory floor, but interfacing with design departments and management. It is interesting to note that at Padaire, the production foremen, who are engineers like their colleagues in Research and Control, are paid less than them and that they are encouraged to be on the shop floor, rather than spend too much time in their office.

5.3 NEW ORGANIZATION

We talk rather blandly about Taylor and Ford, about Taylorism and Fordism, as though the organizers of the production lines were militants espousing one cause or the other. Our sample shows, either in part or in whole, styles of organization which sometimes differ even within the production line.

This is understandable at Padaire, which is in the throws of total reorganization, where what we saw did not correspond with the changes announced or those in progress (new methods of individual assessment have been circulated while the old ones are still in force). In this same firm a spirit of creativity, initiative and decision-making in the name of quality are no more than hollow phrases when making assessments, maintaining standards and doing everything as quickly as possible. At the same time, Sudcases announce that flexibility and adaptation to change are signs of longevity and that these qualities will be taken into account when salaries are fixed.

It is true, we could also leave with the impression (at Chocolate and at Padaire) that operators are made more responsible by being given tasks of maintenance and prevention and by being required to keep their workplace clean and tidy. In both cases this has resulted in a reaction from the service and maintenance departments who see a way of obtaining greater reward for their efforts (they are often on a higher training grade), and

who are demanding a reflection of this difference in salaries, and a human resources department separate from that of the workers).

5.4 FORMAL AND INFORMAL TRAINING

Formal training

Naturally, the differences between the companies will be substantial if production lines resort to using what we still call new technology, but which is no longer that new, given its introduction (some may say intrusion) into simple processes. Wrapping and packaging machines are interesting examples in this respect. This holds particularly true in the case of Chocolate and Padaire with completely different products but where operators have no access to sophisticated technology. Formal training is only available to them if they reach the levels of organization and work management. In the case of training for middle and senior management and also commercial staff, we find "classical" training courses which are purchased externally (Chocolate), or which are organized internally, in turn making them into a commercial product which can be sold to customers outside the market. Total quality training (circles), courses in computing for administrators and computer-assisted training techniques, are all products which Padaire makes available to part of its personnel and, at the same time, sells to its customers. By comparison, initial training courses (introduction to computing, language courses, introduction to management training) are purchased from external training organizations, either public or private, which comply with a traditional schedule of conditions like any other supplier. It is interesting to note that, at Padaire, the organization of this formal training is not the responsibility of the "Training" department but the "Personnel department".

At Chocolate, "formal" training may be requested by anyone, but decisions are made by the production department since the only specific budgets at the disposal of the factory foremen for this kind of expenditure are the salaries for the operators (or managers) who are on training courses.

At Sudcases, everyone can achieve their personal needs as far as training is concerned, but there is no specific budget and participation at one or other seminar represents a reward for good services rendered. This appears to be very characteristic of small- and medium-sized businesses.

Formal training programme

At Chocolate the supervisor (who is always a woman) is an operator alongside the others. However she is different. Her versatility provides her with tremendous mobility on the production line where she knows everyone. She knows the strengths and weaknesses of each operator even outside the work place. She acts as an interface between the practical aspects of doing the job and the line foreman who uses her in order to keep abreast of all that is going on. The simplicity of the movements and the checks require little more, apart from on the rare occasions when the introduction of a new machine necessitates explanations from the supplier.

The situation is different at Padaire and at Sudcases where different aspects come into play but the same intellectual processes are required. The gulf between the design departments and the production lines is such that the task of imparting any necessary but limited information to the shop floor is delegated to selected operators (the instructors or the line foreman himself). Should the instructor or the line foreman be technically competent to carry out this task, it does not follow that they are necessarily competent teachers.

At Chocolate, a public training body (the V.D.A.B.) has been requested to develop a specific programme over a period of four years to assist line foremen in their "supplementary role". At Padaire a special training department has been set up for this purpose. It is true that instructors (selected operators) have been appointed to act as an interface between the operators and the production foremen who, in turn, act as both judges and the judged when the representative from the research department comes to introduce a new aspect of development. This training department is unusual compared with the kinds of personnel departments which are well-known on the training market. For the moment it is moving into and absorbing the "Organization and Efficiency" department and is transforming it in order to give (or give back) a sense of realism vis-à-vis the international market. It is interesting to note that the trainers, who are psychologists, first of all worked as operators on a production line.

Informal training

To a greater or lesser extent it accompanies every human activity. However, it would seem important to give it a special place at a time when it appears to have adopted a new and specific role. No doubt, the first objective of the "formal" training given to the instructors, supervisors, line foremen and to the production managers themselves is to make them aware of their responsibility when passing on information, motivating the line and correcting attitudes. The informal aspects always remain informal.

At Sudcases, there is talk of social dialogue, (it appears in all the texts), at Chocolate, they speak of climate and would like to formalize the variables, at Padaire, formalization is complete - no doubt the involvement of specialists in educational relationships and social communication is not present for nothing. This informal element is also to be found in initial training when "on the job training" becomes "alternance teaching".

5.5 VERSATILITY

The concept of versatility in the companies we have presented has different meanings. There was a time when it was desirable to be a specialist with limited training which covered one particular market. These specialists, often tied to one company, became the slaves of the twentieth century. At the same time technical and vocational education was developing the antidote, namely the acquisition of transferable competences. From this grew the idea of versatility. In real terms this versatility does not always have the characteristics of broad qualifications, but often that of one basic skill. It is possible to be responsible and autonomous within a tight circle of skills.

The Padaire case is a good illustration of this. When describing the "Leittexte" method (see above), the instructor sets out the final objective of the training, that is proactive versatility (pro-aktie, polyvalentie). This does not consist solely of having a whole range of competences, but also the capability of acquiring others independently. Learning to learn to gather knowledge, to unravel a problem, to understand a work plan and assess its strengths and weaknesses, all this is vital to the aim of acquiring more flexibility and a greater facility to adapt and change. (These aims are explained in a document distributed to "pupils"; it is the job of the instructors to train the operators accordingly).

It goes without saying that results are different and that not everyone achieves this proactive versatility. Answers to questions regarding the standard of operators at the time of recruitment are vague. As for the instructors, they are recruited from among the operators. It is likely that at this level there is a mixture of people from technical and other educational backgrounds. The formal side of the Leittext method with its elaborate method-

ology (e.g. instructors making and using their own overhead slides) leads us to believe that natural selection on the job has taken place since the arrival of the psychologists in the training department. It was also noticed that these instructors have a tendency of standing in for the production foreman on the line (he is not physically present enough of the time), and that, on the other hand, the production foremen attempt to limit the instructors' training time by claiming that production is suffering.

None of this is relevant to the versatility which is described at Chocolate: "being capable of carrying out all the tasks on the production line", or as at Sudcases: "being able to complete all the different manufacturing processes within the same cell".

5.6 SHOP FLOOR, CELLS AND PRODUCTION LINES

The physical and material organization of production lines is not a haphazard affair. In this respect, the three cases are interesting.

- At Chocolate, the production lines are just like chains apart from their size. In fact, certain machines can replace a number of work positions which were previously required to make the product (in this case chocolate and chocolates). The work positions which we studied are determined by the machine itself which is watched and checked.

- At Sudcases, everything has changed. Cells, always consisting of a limited number of people (3/5 operators), varying in size, with access to the machines necessary to manufacture the product, have total responsibility for producing a particular article.

- At Padaire we found a mixture of cells and mass production.

All this is relevant when looking at the characteristics of the communication networks which are produced by the different styles of organization.

The organizers imagine that the production area consists simply of fixed work positions. Whether in the workshops (with the floor space in evidence), on the production lines (organization appears), in cells (there is only organization), operators are part of a production line where they play a part only by virtue of their occupational skills.

Physical partitioning is visible on the ground through the protected perimeters (partitions or lines on the floor). There is always a threshold to be crossed. It increases the number of exchanges required (messages, transport of material, continuity of technology) and encourages other exchanges including exchange of knowledge and informal training. It is clear that the more informed and aware workers participate more in these exchanges and reap the benefits in their individual occupational development. This becomes a new means of selection. Thus, mobility (access to stocks, regrouping of manufacturing units, meetings with other cells, organized formal training), encouraged by appropriate organization, is opening up the production area. Manufacturing networks which are springing up and which organization is making concrete, are, without doubt, contributors to this informal training which it is difficult to pinpoint. In all networks there are knots and arteries. This is undoubtedly a new source of differences.

5.7 ELITIST COMPANIES

The sheer size of the companies makes it difficult to compare them when operating at a level where workers are far removed from this aspect. Is it possible to talk to operators

about career prospects when they are happy to be working in a company whose future seems to be internationally assured? This discussion only arose at Padaire, a company which is managed along the lines of a public sector company and in which, we ourselves discovered with amazement, the instructors (promoted operators) can improve their position by taking on some of the head of production's numerous administrative tasks (organization of holidays).

Vocational training, it is true, is encouraged by the many new things learned every day through contacts facilitated by work organization, but it is also dependent on the aptitude a person has for learning from others.

SECTION 2 – THE FRENCH COMMUNITY

1. INTRODUCTORY NOTES: FOCUS ON SKILLING "POCKETS" IN THE INDUSTRIAL SECTOR

This research, which is exploratory in nature, is based on the acknowledged fact that various developments are encouraging companies to place more importance on training than ever before, be it in response to changes which have arisen in work organization, in technology or in the constraints imposed by markets and the environment. This does not mean that these challenges are the same everywhere or that they arise in the same way. However, what we are seeing with an entrepreneurial economy and widening competition, are the growing possibilities for "pockets" to spring up in which skilled work, or at least work which has a training impact, can develop. At the risk of making generalizations too early on, we would like to include this inference when considering a company's aim for quality. We shall offer the opportunity of examining the increase, particularly in industrial sectors, in the continuing vocational training stakes.

In response to the challenges of what some people may call the rigidity of Fordism, companies were in the first instance set on discovering every possible way of answering the need for quantity, whether internally or externally. With this in mind, they attempted to reduce labour costs, to stabilize or cut salaries and to trim back personnel through redundancies, early retirement or by delegating work and using subcontractors, borrowed labour, part-time work, sometimes even resorting to home work or distance work. Job instability thus became the consequence of numeric flexibility.

And yet this numeric or quantitative flexibility is probably neither the only nor a satisfactory answer to the challenges of change. Very quickly, as a result of the widening of fields of competition, companies are discovering to what extent quality and reliability, innovation and regard for consumer choice are becoming the main criteria of production. A new system is emerging in which competition is not only based on production costs and prices, but also on quality, variety and variation, along with the time and cost involved in designing a new product.

In this sort of scenario, versatility and adaptability, together with quality and a reliable workforce, assume strategic importance. The ability to develop, assimilate and pass on knowledge and expertise become central to success. This, in turn, leads to the search for and development of qualitative flexibility. With this in mind, operators are trained and encouraged to update their skills and abilities continually, failing which the company cannot absorb the changes which occur,both internally or externally. As a consequence, there has been a rapid increase in the subjects, areas and techniques of training; companies are taking more interest in informal knowledge (that is to say, the formalization of the informal) and the operator's creativity and imagination; there is now a trend towards recruiting workers who already have sufficient work experience and those who show an inclination to learn and to become trained.

This state of affairs is, by no means, relevant to all companies, as has already been shown in the case studies in chapter 2, nor are policies of quantitative flexibility always excluded. We have even noticed that certain companies play it both ways: quantitatively with a number of marginal workers who are virtually unskilled (particularly for short-term purposes) and at the same time investing in human resources with a hard core of skilled workers.

We should no longer make generalizations about the theory that a particular job or company encourages skilling. Such a theory is, in any case, disputed by those analyzing

new forms of "Taylorism" and "Fordism" in work which is often the result of a company's intense specialization. It is a fact that many companies are restructuring (in terms of space and activity) by dividing work between different units either within one company or between several companies belonging to the same organization. This division of labour between numerous units whether internal or external, far from encouraging skilling, can have the very opposite effect if it leads to work being carved up into little bits. However, the techniques and forms of decentralization and "deverticalization" in companies, the inter-connection between them, and the contracts for supply and sub-contraction all have a certain influence on the skills required. Sometimes this leads to loss of the skills, and sometimes to their acquisition. Analysis is inevitably complex in that often industrial units and work organization only have training impact after unskilled work has been suspended or unskilled workers have been replaced by machines (cf. for example, the abolition of the job of mirror handler in the filling department at SB - section 3 of this chapter).

It goes without saying that certain forms of modernization reinforce the characteristics of Taylorism and Fordism (particularly the separation of work design from work production, splitting up the production process into basic units, supervising each individual's task as closely as possible, loss of operator skills). This intensification of production operates, for example, by means of centralized calculations which establish "a data-based economy which demands the most complete possible extraction and explanation of data on physical and organizational aspects of production and management so that mathematical formulae can be applied, thereby achieving optimal functioning." (J. Merchiers, 1990, p.29). An example of this trend is provided by F. Lautier in a description of a clothing manufacturer in Normandy where, as a result of the introduction of computers, " from her office, the person in charge of production, has the means of knowing, at any given time, and in real terms, how well orders are progressing; from this data, as is often required of someone in this job, she is able to calculate exactly when the order will be manufactured; if necessary, reorganizing production so that a particularly urgent order can be completed; adjusting the speed at a particular work position which would otherwise be too slow; etc." (F. Lautier, 1986, p. 172).

Nevertheless, it would be difficult to deny the existence of, even the increase in, "pockets" where qualitative flexibility and work with a training impact are to be found. We will now turn our attention to companies in this category and to particular sections of such companies. In contrast to the view which seeks to demonstrate the negative effects that technological and organizational changes have on skills, we believe that we are seeing an increased need for training and organized continuing training in an ever-growing number of companies. We are moving into a situation where, increased competition, in terms of quality, emphasis on choice and technological modernization, are and will, to a greater or lesser extent, represent "the right moment to shift the emphasis in work organization and the role given to operators towards more involvement and responsibility. Such involvement is facilitated through the horizontal despecialization of work and by bringing production and other departments (methodology, maintenance) closer together; in this respect, the skills of basic operators are the subject of growing attention with various training strategies directed at them" (C. Maroy, 1991, pp. 26-27).

Due to the restricted volume of this publication, only two company profiles have been taken from the research report which, in fact, studied three companies (see J. Delcourt and B. Fusulier, August 1992). In this initial report, it seemed interesting and useful to choose parts of companies which corresponded to the various stages of the production process. In line with this, and along with our wish to study sections of companies which were fundamentally interested in training workers, we directed our investigations at units which had not only changed their method of organization, but which seen together, constituted a logical succession of phases: hence the choice of two production units, a warehouse department and a sales company. The units in question correspond to con-

secutive stages in the production/distribution process, which allowed us to reconstitute an idealistic integral company in a diagrammatic way, even if the parts analyzed belonged to different companies. Thus three companies were studied:

- a company which produces headlights for motor vehicles (see section 2). Within three years it has changed from mass production lines to small production lines in semi-autonomous cells, without technological modernization or large-scale redundancies;

- a pharmaceutical company (see section 3). We analyzed two departments in this firm: the filling department (filling of bottles or tubes of vaccine) which has reorganized its work in such a way that there are now teams which belong to a production system, compared with the previous situation where workers were generally interchangeable; the warehousing department which currently runs a rotation of personnel grouped in cells and which has invested in up-to-date technology;

- a company selling products for maintaining buildings. This company is a model of work organization in zones (each representative is given his own work "territory").

Note that all these units were chosen because selection for the job is not made on the basis of a particular qualification.

Studies were carried out on the basis of interviews with company executives, supervisory staff and operators. The types of questions asked referred to work organization, training methods, description of the skills involved and work motivation. A questionnaire on professional values was also distributed (the QVP by Donald E. SUPER - Edition by the Centre of Applied Psychology - Paris).

The study must have its limits. When looking at the company's history and its place in the market we introduce some background information but, nevertheless, our approach is up-to-date rather than chronological. Consequently, what we have presented is a snapshot of a dynamic reality.

Hereafter, the chapter is divided into two major sections: the first is a profile of the company "lighting" and the second of the company S.B.

2. COMPANY PROFILE - LIGHTING BELGIQUE

2.1 DESCRIPTION OF THE COMPANY AND THE ORGANIZATIONAL CHANGES

2.1.1 BACKGROUND

Lighting Vision Belgique, formerly Cibié, designs and produces lights for cars and lorries. This company supplies the majority of car manufacturers (Fiat, Ford, Jaguar, Lancia, Nissan, Peugeot, Renault, etc.) with high quality car lights, spares and lighting extras. It has around forty customers.

From 1969 to 1985 the factory was mostly involved in mass production (90% of its output). Its integration into the multinational group Lighting[2] has meant that it also produces spare and additional lamps for cars. This new responsibility has led to a management policy of short series production. The average size of production batches is now 750 items.

The commercial catalogue of the Belgian division of the Lighting group shows 120 types of products (depending on the make of car) and has around 2,500 different reference numbers. This large number of references is due to the fact that there are many variables, the majority of which are for the same type of product: right or left headlamp, right-hand or left-hand drive, yellow or white lights.

The firm currently employs nearly 400 people and has an average monthly turnover of 150 million Belgian francs.

2.1.2 HISTORIC DEVELOPMENT

In the early stages, the Belgian plant manufactured lamps by means of mass production. Only 10% of output was produced in short series. Nevertheless, the factory was already working on 35 different types of products, while the two French factories, to which it is closely connected, were only handling 10 types of products. From 1970 to 1985 organization and production remained stable. But in 1985 came the idea of specialization and dividing production between the sites. Due to its strong geographic position in relation to manufacturers in northern Europe and the many types of products handled, Lighting Vision Belgique was chosen for the production of short series. This major change was not, however, accompanied by an equivalent structural change, that is to say, the socio-technical organization of the company was not fundamentally altered.

In 1987, burdened by the transfer of so many new product ranges (the number had by now increased to 75), work organization was under severe strain. Solutions were piecemeal and were restricted to the production areas (the main development being an increase in the number of conveyor belts in line with Taylor and Ford type production). In fact, the two major problems facing the company were: the impossibility of making long-term forecasts and bulk of stock. The changes consequently had an impact on production flexibility. The way the factory was originally organized in production lines meant that six customers could be serviced at one time. This was totally insufficient. Thereafter eighteen products (of a total of 75) could be manufactured simultaneously. The waiting period between placing the order and delivery (25 to 100 days for the supply of basic materials + an internal period of delay which could be as much as 85 days) was no longer feasible in the face of competition.

In 1988 the group confirmed the company's role as a short series manufacturer. This led to the decision to create an autonomous division (Lighting Vision Belgique). This decision was made firstly, within the framework of a general policy of making the various plants financially independent and secondly, as part of an economic strategy of penetrating the German market which had up until then been more or less closed to French products. This new autonomy demanded the introduction of a "superstructure" to reorganize the existing production systems. The result was the employment of a large number of executives to conceive and manage departments which had never existed before: commercial, quality control, computing, research, human resources, etc.

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[2] The Lighting group specializes in the manufacture of car accessories: lamps, headlights, radiators, alternators etc. It employs approx. 27,000 people and has around one hundred plants spread all over the world.

In June 1989, a new managing director for the Belgian division was appointed to introduce the socio-organizational changes necessary for the factory's survival. He drew up a comprehensive business plan: the industrial management of short series production (the project was called GIPS). The GIPS project aimed at making short series production into a "vocational occupation" based on the principles of "just in time" and "total quality".

2.1.3 General description of the production process

A lamp is manufactured in four stages:

- pressing;
- finishing;
- surface treatment;
- assembly.

The **pressing** stage consists of pressing the lamps out of a roll of sheet metal.

After they have acquired their shape, they have to be **finished** off: putting in the notches and the indentations, soldering the claws so that the reflector corresponds to the various models required.

The mirrors are hooked onto a conveyor belt and taken to be **surface-treated**. At this stage the mirrors are degreased, covered in zinc phosphate, rinsed and dried in a phosphate drum. After being transferred to other conveyor belts, the mirrors are taken to powdering units (there are four units). Here the mirrors are covered with an epoxy resin by means of electro-static injection. They are sent to different units depending on the type of mirror. After this the epoxy resin must be baked. At this point the mirrors are transferred onto one of the three conveyors which pass through one of three ovens. Once they have been baked, the mirrors are aluminized: the reflectors are placed on a support and are dried in another type of oven[3]. The supports are then put into one of the fourteen vacuum machines. a strip of aluminium is placed onto an element and the particles of aluminium are vaporized onto the inside of the reflectors in a vacuum. Certain mirrors are not aluminized by vacuum machines, but are sent to another part of the factory where they are treated. The surface treatment is completed by possible varnishing, either yellow or colourless, after the mirrors have been hung on the conveyor belt.

Assembly is that part of production where all the component parts of a lamp are put together to create the finished product. These parts are: the reflector, the glass, the light, the screws and nuts, the glue or the joint.

Workers in the production area, from the pressing to the assembly stage, have a lower level of primary or secondary vocational school.

2.1.4 Organizational changes

The main change in organization revolves around the principle of specializing the production lines and production units, using existing machinery. The aim is to find ways of using the machines so that they can handle the variation in orders in terms of both num-

[3] A hollow cylinder into which the supports are placed so that they can be dried by radiation.

ber and quality. Previously, specific machinery was positioned along the length of a conveyor belt depending on the type of article being produced. When the product was changed, the machines were substituted and kept in a machine store.

The difference between the old and the new systems is based on the fact that work is now carried out in production cells, which individually handle products which are similar in type. Each cell (9 in the assembly workshop) is subdivided into production centres (46 in the assembly workshop) which are responsible for one single or several types of products (CF. Fig.1).

Following proposals presented by the firm Andersens in September 1989, pilot cells were tested. In December 1989, the management decided to put their ideas into practice throughout the factory: this entailed the formation of production cells using the machine store in such a way that particular machinery which is used for the purpose of producing a particular item is kept in the same place thereby decentralizing the shop floors. Since then, each cell has had at its disposal all it needs to manufacture products "just in time".

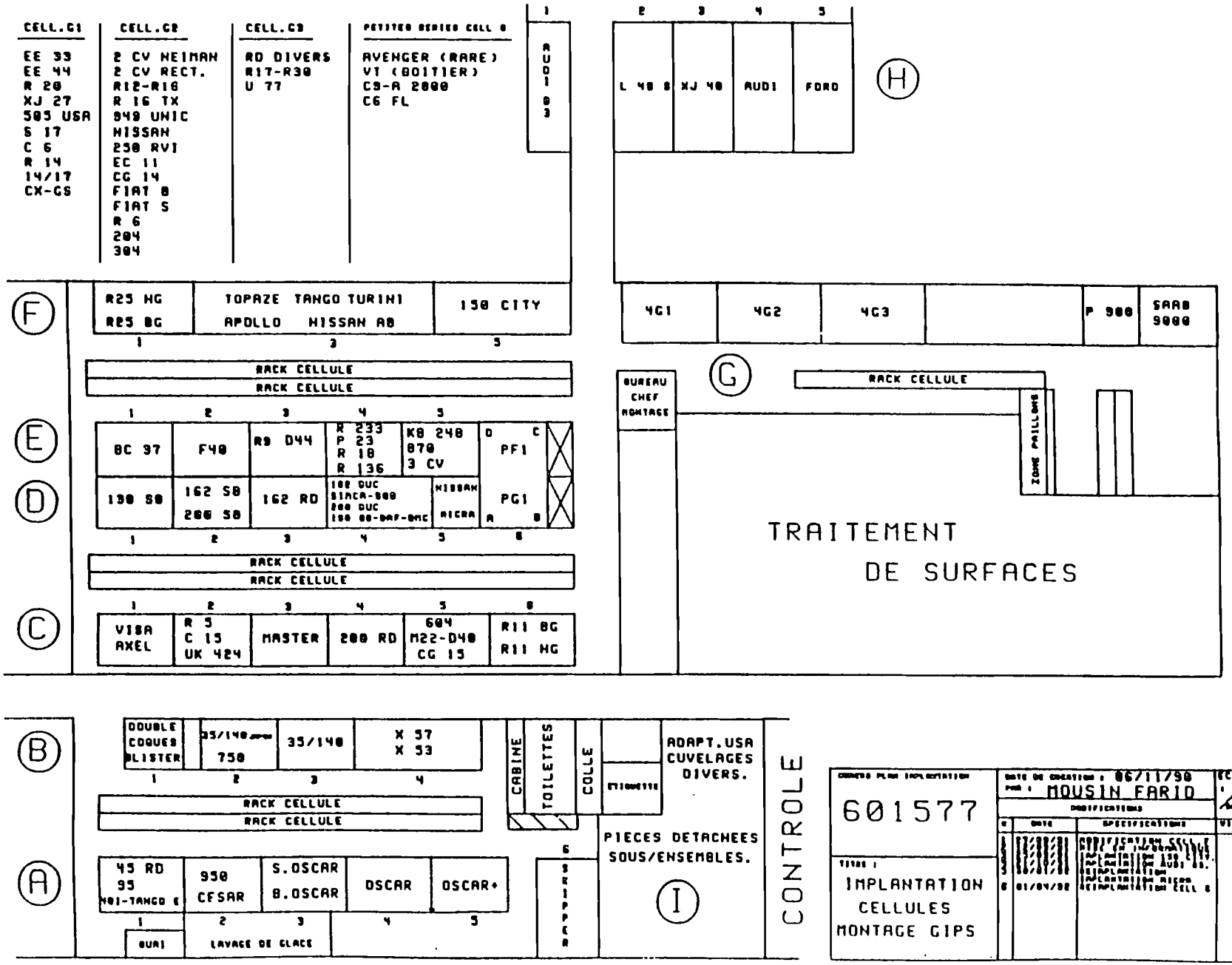
"Just in time" production is based on the Kan Ban method which reverses the normal direction of manufacturing instructions and information flow. *"Instead of production following a step by step pattern starting upstream and flowing downstream, it works in the opposite way. It starts from the orders received by the factory and the products already sold. [...] The key to the method consists of establishing, parallel to the real production flow (which travels from upstream positions to downstream positions), an information flow which works the other way, with each downstream position giving instructions to the upstream position which immediately precedes it"* (B. Coriat, 1991, p. 49). In concrete terms, the system for passing on information works by means of notes or notices (literal translation of the Japanese term Kan Ban) on which instructions for the preceding position are written. The storeman (or handler as the operators call him) is the main person in the relay, the link between "upstream/downstream" cells.

This reorganization of the system of setting up the machinery together with the information flow currently means that 46 customer orders can be dealt with simultaneously. Nevertheless, when the order book is really full, even more effort is needed to meet customer deadlines.

At operator level we are talking about a fundamental reorganization of work and skills. Indeed, under the previous system (from 1970 to 1988), there was a conveyor belt with approximately twenty female operators standing around it carrying out one or two operations at a rate of 400 items per hour. Each operation took less than 10 seconds. Clearly the skill needed to do this job was limited to the motor and psychological capacity of repeating an action: a type of work which "managers" considered to be more suited to women than men.

Fig. 1. Diagram of the assembly workshop: distinction between cells and islands

NB. Cells E, F and H are the ones being studied



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The new organization has dispensed with the conveyor belt and has grouped machines together at U or at L and has positioned one or two operators on a production island. They must now be able to master all the operations involved in the assembly of a lamp (up to 70 successive operations). They are also in charge of between three and eleven machines, each one carrying out a different function in the range (gluing, screwing, crimping, etc.). Moreover, the operator is responsible for the quality and the quantity of items manufactured. At the beginning of the day or the week she receives a list of the items necessary to make up a particular batch. Using the list, each worker must ensure that she has all the components needed, then carry out the different operations, checking the quality (conformity) of the product at each stage. In the case of a fault she puts the defective part into a red bucket for rejects. These are later collected and coded in the computer either by the head of the cell or her assistant (the "flier"), or by the operator herself. After that, someone tries to establish the origin of the defect. If it is found that the fault arose in a particular production centre within the factory, that unit has a mark notched against it by means of a red ball which is slipped into a transparent tube positioned at the entrance to the island, thus visible to everyone (the "thermometer" as the operators call it). If, on the other hand, no fault is found in the batch, a green ball is put into the "thermometer". Thirteen balls fit into the tube.

The management's long-term objective is to make the operators completely independent during a working day or even a week. With this in mind, the management is trying to develop fully the skills of the production staff, especially the regulation of their machinery. Starting up the machines and changing the series and the references require a certain number of operations which were previously the responsibility of a special category of worker: i.e. setting-up technicians. Note that they now devote their extra time to the preventative maintenance of the machines.

All in all, the major part of the systems reorganization took place in September 89, after which the new organization was tested by means of pilot schemes between September and December 89, and was then made general as from January. Within seven months almost 3/4 of the machines had been moved and the workers had to adjust to more demanding work which required them, from then on, not only to use different machinery, but also to read, write and count[4].

The supervisors were the first category to be affected by the reorganization which, in fact, reduced the levels of hierarchy and increased response and communication. The staff concerned (known as "foremen") were drawn into the GIPS project (13 people). The management was obviously determined to give increased responsibility to those members of staff who had been "earmarked" to take part in the project. The people we spoke to told us that some employees started to feel insecure during this period and left the company.

These organizational changes, albeit without any accompanying technological modernization, did not, however, (at the time when we studied the company) lead to a string of redundancies. Certain jobs disappeared - "handlers", controllers, foremen - but other jobs were created. Such was the case with the job of multiskilled operator (working within a restyled group compared with working at a simple position), and the job of internal auditor (checking the efficiency of the system: from the point of view of procedure and skills).

[4] It must be remembered that workers in the areas of production, pressing and assembly are of primary school or A4 level.

2.2 TRAINING PROVISION

We shall begin by presenting the different training courses which were set up to support the GIPS project before returning to the process introduced for ensuring total quality, which we will examine by looking both at the training arrangements and the other types of schemes introduced by the management.

It should be noted that during the first eighteen years of the company's existence, there was no-one in charge of training nor were there any training initiatives apart from some courses for certain technicians and executives.

With the need for new competences, arising as a result of the GIPS project, the question of training and communication has become a top priority in the eyes of the management. A training programme was drawn up in 1990, and in September 1991, one of the employees, a former production technician, was officially put in charge of training. In 1990, 220 out of 440 were involved in training with each trainee receiving, on average, 46 hours of instruction; in 1991, 250 people received training with an average of 40 hours each. In 1992, the training budget represented 3.5% of total payroll.

2.2.1 THE TRAINING PRACTICES RELATING TO THE GIPS PROJECT

We shall present the main spheres of training while at the same time emphasizing the overall philosophy from which they spring. The company's objective in training is to optimize both the new way in which work is organized and the new style of managing production. This means developing different competences among the various categories of shopfloor workers so that the new form of management can be established and run smoothly. Naturally, different categories are affected in different ways; however, the changes do affect a large number of the production personnel.

Firstly, we shall look at the training provided for the assembly workshop (the operators as a whole and the first level of the hierarchical pyramid: n+1). Secondly, we shall examine training relating to the pressing section. And lastly, we shall turn to training for total quality which should be relevant to all personnel and all the workshops.

1) Training for the "production cells" in the workshops

The main objective in training is to familiarize all the workers in the workshops with the new system of organization. The theory is to ensure the system's success by encouraging all the workers to accept it, by offering them the means of acquiring the new skills and abilities needed to carry out more varied work, and by encouraging new relationships among the basic operators and between supervisor and operator. What we should also highlight is the way in which training represents an important lever for ensuring that reorganization produces the expected results, that is, a more efficient use of overall production time.

We shall now look at the forms of training available to all shop-floor workers be they operators, supervisors, setting-up technicians or maintenance mechanics.

Training in the principles of organizational change

With further reference to the firm of consultants, Andersen, who were appointed to reorganize all the machinery in the company, initial training was quite simply designed to introduce personnel to the principles of just in time and to explain the physical reorganization which was taking place. The training objective, therefore, was, above all, to dem-

onstrate to everyone the importance of this reorganization for the company; also to present the benefits that it could bring the workers. One manager told us that "the main objective was to reassure the workforce". Meetings were organized for groups of 20 people at a time each lasting two hours. In addition to informing the workers directly, information was given by the board of directors on the implications of the reorganization on jobs, salaries and mobility within the company.

"Product" and "process" training

The following types of training are designed to support the introduction of production cells and the partial introduction of Kan Ban into the assembly workshop with all the changes that this implies. Firstly, we shall look at the tasks of the operators.

During the first half of 1990, "product" and "process" training in general terms was given to 380 people out of 420 in groups of 20 for a period of 3 hours. Those involved were the assembly operators, operators from other workshops, setting-up technicians and supervisors, particularly the new heads of cells. Training for the operators in the assembly workshop took place "on the job" covering a variety of aspects. What was the aim of this training? Firstly, as the training manager put it, "it was a question of ensuring that everyone understood the production process in concrete terms, and that everyone understood the sequence of production and his own part in that overall sequence". Secondly, it was planned that "product" training should teach employees how the basic product worked (with headlamps, for example, measuring and regulating the light) so that everyone could take part in quality control with the knowledge of how things operate. In company jargon this was called promoting "critical ability".

Other characteristics of training were as follows:

- training **content**: production process; sequence and interdependence of the operations; characteristics of the product; technical requirements for the functioning of the lamp; main aspects of quality control carried out by the quality control department, and the main problems encountered in quality control;

- **trainees**: all members of staff: supervisors, technicians and operators;

- **trainers**: internal trainers from the methods and quality department, and from the "GIPS" cell;

- **methods**: videos, question and answer sessions using video; booklet distributed to all participants summing up the material covered.

Training was extended by the possibility of putting questions to the supervisors or the regulators on the more specific characteristics of this or that product during normal production time.

It can therefore be seen that this initial training has three major aspects: apart from the fact that it is directed at almost all personnel, in any case at everyone in the assembly workshop, it has a dual content: technical (product) and organizational (production process). Thirdly, it is planned that the smallest decision taken by an operator (quality control) is taken within the context of the new system of production management: the operator must understand the demands for a quality product but at the same time understand the interdependencies of the production process so that he is aware of the consequences of these decisions downstream and ultimately on total production time. This aspect is reinforced by other training courses.

"On the job" versatility training

This type of training has an obvious purpose: it is connected with the introduction of production cells. The operators must become versatile so that they can carry out all the manufacturing tasks in all the production areas of the same cell, thus enabling operators to be transferred to other production centres depending on the orders. In addition, they must learn to do small maintenance jobs (cleaning and tidying their machines), quality control and organizing production where it falls to their responsibility (filling in traceability forms, sometimes measuring manufactured parts, coding these measurements by means of the SPC software). The person we spoke to told us that this training was done on the job; workers were obliged to change tasks approximately every two hours so that gradually they would learn all the operations which are carried out in one cell (as many as 70 operations). In order to learn the task, the operator could either ask the head of the cell, ask other operators who already knew (mutual training) or otherwise read the instruction sheet which sets out in detail the operations to be carried out for each task (self training). On-the-job training took place over a period of time which the training manager said was difficult to specify: he estimated between one and six months. The production load remained constant during this period.

Training the heads of cells in the assembly workshop

As we have seen in the previous example, the heads of the cells can be used to train the operators. This is one of the new supervisory tasks. The role of supervisor in the changing structure has altered considerably. Previously, in fact, supervisory staff consisted largely of setting-up technicians who had two jobs: a technical task and the task of supervising the standards and times specified on the various production lines as set out by the methods department. These setting-up technicians were later integrated into the GIPS team and are now more involved in preventative maintenance or improvement of the processes. This means that the new supervisors have been drawn from among the operators. On account of their central role in the present pattern of reorganization, the operators, and particularly the heads of the cells (n+1) have become the object of increased attention from the point of view of training.

The tasks of the head of a cell are threefold:

- **managing production**: the company's objective is for a cell to become completely independent when carrying out its weekly workload. Thus the cell organizer receives a weekly programme from planning which she can arrange and effect to suit herself. Accordingly, she shares out the work between the operators in her cell and then designates them to one or other production centre. In addition, she must enter the codes for daily production into a computer terminal, from which she can obtain various information about the type of product, component parts, etc. Fetching the supply of component parts is the responsibility of the operators using the Kan Ban system and the bucket of parts, as seen above; the same thing applies for quality control operations (traceability and coding data for the SPC).

- **training and information**: we have already discussed the role which the head of the cell has come to play during the changeover period to job rotation. In addition, they must be able to answer the operators' questions on production management, quality, etc. Furthermore, they have a role to play in advertising the company's policy on total quality. They are seen as "bearers of the message of quality" that is to say, trainers embodying the yardsticks of quality (not only the concept of quality itself but also the means of detecting and resolving problems, e.g. the CRIME method). Also, according to one executive, previously, when the directors made certain announcements, the news never went further than the n+1 level. From now

on, the directors want the heads of cells to be the channels of communication in the company, so that the operators know what is going on.

- **motivating and encouraging the team** with the aim of boosting production. Thus, in the process of improving quality, it is the heads of the cells who must "stimulate workers' enthusiasm for improving their methods, their field of operation and their motivation" (also responsible for training).

Apart from wanting to confirm their importance in their job specification (promotion to employee status), the directors intend to introduce various training courses thereby encouraging promoted heads of cells to accept their new job definition.

In addition to the training courses planned for 92/93 as part of the CROSBY quality programme, four types of training were presented in 91/92 for the n+1 level:

- The AGESOC training programme (Assistance to social management): involved all the supervisors and lasted for two weeks spread over seven to eight months (104 hours): training aimed to prepare them "for their role as team leader": it consisted of different modules relating either to their psychological knowledge or abilities (communication, leadership, motivation, holding meetings, resolving problems, etc.), or their economic or organizational knowledge (knowledge of the company, the function of the various departments: finance, personnel, production, etc.). Training was provided by a trainer from an outside agency who spoke beforehand with the executive concerned thus acquainting himself with the day to day functioning of the company.

- Training clearly attempts to fulfil two aims: firstly to provide an understanding of the company as a whole, its administrative problems and how to ensure its viability and productivity; secondly to encourage the cell organizers to develop skills in group management and a participative style of supervision. It is plain to see the strategic role of this type of skill in an environment where the directors want the operators to take part in both the general running of a company which optimises production flow, and the constant improvement of functioning in overall terms (worker participation in raising standards).

- Training with production management software: training given by executives from the quality, computing and planning departments aims at introducing heads of cells to the possibilities of using terminals for management and production purposes. Training is of a more technical nature.

- Training on Statistical Process Control (SPC): given by an outside body (within the framework of the IFPM), this training is first and foremost for executives from the quality department who are at levels n+2 and n+3. Nevertheless, a shorter training course was offered to the heads of cells on this subject so that "they could answer questions from operators who have been asked to fill out cards (returning to the idea of marking in order to ascertain how much machine work has been done)".

- Training known as "analysis and control of the work position" (Sogesal, length 56 hours): was offered to two heads of cells externally within the framework of the IFPM: it was later established that all would benefit from this. Again, the training was in response to the general reorganization in the company. According to the training manager, it was very useful *"when one has to train groups to improve quality and processes, and when one has to consider how working positions can be made more productive. This training programme takes into account the whole production flow. This means handling, stocking, operating time, re-handling, re-stocking, and*

within this time there is only a very short period that the customer is prepared to pay for; consequently, all wasted time must systematically be eliminated." We have included this extract largely because it demonstrates the two aims: namely to encourage people working in the cell to accept the new criteria for productivity, criteria which the market demands, and also to suggest ways of analyzing work positions and processes in order to maximize overall production time.

The wording of the training description explicitly mentions that Taylorism is outdated. Training is especially relevant to situations where there is a repeated process of improving quality (in particular the creation of groups for the improvement of quality) in which, as we have seen, heads of cells are invited to play a major role.

In conclusion, it appears that the training which has been described, prepares supervisors for various key roles, thus ensuring that reorganization leads to an increasingly economic use of production time and the improvement of quality. On the one hand, they must be capable of supervising the production cell from day to day, guaranteeing output while at the same time allowing the operators certain margins of independence, maintaining and reinforcing their interest, their collaboration and cooperation, etc. And on the other hand, they must be capable of motivating them to work more quickly while improving the production process as a whole. The management's philosophy, therefore, is to abandon a formalized and autocratic style of management, introducing in its place a more "democratic" style which is essentially based on motivating workers within a defined autonomy.

2) Training for changing series production

There are other forms of training which it is interesting to examine, partly because they are connected with the problem of redefining the job of the operator (widening the range of tasks to include regulating certain machines) and at the same time adjusting the function of the setting-up technicians (directed more towards preventative maintenance), and partly because they address the problem of cutting down the time it takes to change a series and consequently the overall production time. Two types of training are relevant in this connection.

Training operators in the assembly workshop to change the series

Only the assembly operators are affected because changing the series in the other workshops involves operations which are considered too complex and too physically demanding (the machinery in upstream workshops is, for example, much heavier).

Training consisted of teaching 150 operators how to regulate the gluing machines. Fixing the glass onto the lamp's parabola requires a strip of glue; the unit is then fixed together by placing it for a short spell in an oven. The gluing machines require a great deal of time for regulation because glue is a viscous material which hardens if it remains inert. Previously, setting-up technicians spent a long time regulating around ten machines each. The aim of training is therefore twofold: partly to train operators to regulate the machines so that less time is wasted every morning before production can begin; and partly to free the setting-up technicians who can then devote more time to either preventative maintenance or repairs (in particular using SPC). Furthermore, as one executive put it, *"all these operations are anything but interesting for a setting-up technician; it is inanely repetitive and requires no imagination. So they were more than happy to be spared this damned nonsense, if you'll pardon the expression. The operators, on the other hand, see it as a bonus."*

Training was given in-house by the setting-up technicians and the training manager: first of all they were given eight hours of theoretical training: with the help of a video and a set of examples the operators could understand how the machine functions and the cause and effect between regulating the machine and the quality of the work produced. This was followed by "on the job" training: the operators put their training into practice in the workshop with the setting-up technicians on hand to answer their questions. After training on the job for one month, the operators regulated the machines themselves.

SMED training on pressing

The second type of training connected with changing series relates to the pressing workshop: In fact, it consists of two things: namely, training, using the SMED method, and a project putting the training into practice. The SMED method is Japanese and consists of analyzing the actions involved in changing a tool, deciding which actions can be omitted, carried out in hidden time or simplified, and then redefining the operation thereby reducing the length of time spent changing a series.

The project part does not consist so much of training according to set procedures, but rather of collectively establishing a method of analyzing and resolving problems: it involved everyone in the pressing workshop (setting-up technicians, handlers and press operators) and also people from the quality and methods department with the training manager leading the group. This ad hoc group met for one hour a week over a period of one year, with the aim of analyzing and then simplifying series changes on the pressing machines. This resulted in reducing the time taken to change a series from 5 hours to 1 hour. Therefore, training led to an overall reduction in production time. It is evident that this could only be achieved with people from different departments working together constructively in a team (as the training manager said: *"you can insist that a person comes to a meeting, but you cannot force him to take an active part"*). The outcome was that the various people involved adopted improved ways of managing production.

2.2.2 METHODS OF TRAINING FOR TOTAL QUALITY

When reviewing the different training courses run from the second half of 1990 until 1992, we have already encountered a number of initiatives which reflect the management's aim for improved quality. In this connection we should also mention the "Crosby" training project which the management has planned for the end of 92 continuing through 93.

The principle is based on cascade training. It consists of getting across the message of quality together with basic concepts, persuading the personnel to accept these ideas, and finally providing them with the means of being part of the improvement process. The stages of cascade training are as follows:

- Training the top management: 4 days; presentation of the method.
- Training the trainers: a consultant training two trainers from within the company; the training manager and a quality manager (inspectors).
- Training the management (from n+1 to n+3): training given by in-house trainers over a period of 30 hours (10 three-hour sessions) during the first half of 1992; the objective is *"to train them to think in terms of quality, to understand the concepts, to show them how to analyze and to resolve problems and to teach them how they themselves, because it is absolutely essential, can pass on a simplified message of quality to their colleagues"* (training manager).

- Promoted staff to train the operators: during the second half of 92 for nine hours using supporting videos and a training manual for each trainee; the aim is to make operators aware of questions of quality, train them to try to resolve problems within their capability or to refer them to a technician if they are too complicated. All this comes under the heading of "discovering quality". Training introduces the operator to "concepts, for example, a zero error margin, and, above all, at the same time, seeks to develop a positive attitude towards improvement and aiming at total quality. Thus, it is a question of instilling a responsible attitude towards total quality by getting the operator to see the customer's point of view.

  The final training objective is, therefore, for the operator to adopt an attitude in his daily life where he does not accept mistakes, where, in fact, he also demands a zero error margin: for example, when he is a patient in a hospital or the customer at a garage. He would, on the other hand, accept that one in a thousand lamps could be faulty. The aim, then, is to transfer his attitude to quality in his everyday life across to his working life.

- Training technicians (n+1 and n+2) in "quality in practice": eight two-hour training sessions which aim to teach a special method for resolving problems. The method is called CRIME and enables operators to "kill" problems. There are five stages corresponding to the five letters of the word crime: C for characterizing the problem to be solved and defining the timescale for finding a solution; R for repair, that is resolving the problem so that the customer does not suffer, using a temporary, if costly, solution; I for identifying the causes of the problem by brain storming, process analysis etc; M for mapping out the long-term solution; finally, E for evaluating the solution implemented. This method will be used later on by action groups appointed to correct and thereby improve the quality of the process. It is also envisaged that the operators will later benefit from "quality in practice" training. It should be noted that this training, along with the programme for improving quality, was in progress at the time of our investigation (April and May 92) and that the operators had, at that stage, not started the training.

As far as the content was concerned, we identified three obvious aspects in the quality training courses:

- The concepts, the ideas, in short a **common language** facilitating communication between different departments and individuals: e.g. the concept of zero error margin, total quality, recognition, the cost of achieving quality, etc.

- **Values and accepted behaviour**: words like commitment, involvement, team work, appear again and again in the brochures explaining the methods, and in the talks given by the management. As we have seen above, a good part of the "quality message" is not technical in nature: it is more a question of adopting a viewpoint or learning a reflex, in short, acquiring a moral attitude: to feel a responsibility towards the product, not to let faulty products slip through the net; to identify the source of a problem, to let the boss know about problems, etc. A sense of involvement is therefore necessary so that everyone, at whatever level, can contribute in pointing out problems (indicating where the problem lies each and every time); to spend time resolving the problem either independently and directly, or directly and together with colleagues or supervisors, or indirectly and collectively, often interdepartmentally through what are known as "corrective action groups". It is obviously in the last instance that being able to work as part of a team is particularly important.

- **Techniques**: are part of the CRIME problem-solving method; techniques of holding a meeting, etc.

In turning to the trainers and the training methods used, we should also emphasize their level of conviction. They stick to the principles which have almost become categorical imperatives (the managing director talks about the continual search for excellence). At the same time, the technical approach is systematic and methodical, aiming at very precise results which can be measured; e.g. the measurable drop in the costs caused by poor quality. Accordingly, training is given in-house by executives who "must become involved in order to pass on the message of quality" and who believe in it all the more through passing it on. In other words, according to various managers, the success of the operation depends on "the involvement of the directors and managers", an involvement which must be apparent when they are training personnel. Moreover, the most important time for broadcasting the message is not during formal training courses on quality; what is more relevant is that managers should put their principles into practice: their ability to question themselves, if the problems are attributable to them (when they have red balls in their quality thermometer); being open to the opinions and solutions offered by the operators, etc. In short, everything should run in such a way as though the management and, in the first instance, the directors are setting the example, an example which emphasizes their commitment to the search for "excellence".

The technical aspect of the programme for total quality is in fact limited to a set of instruments for measuring poor quality. These are to be found in all departments; it also consists of a system of communication surrounding the programme, and a mechanism called "corrective action groups" involving the functions already mentioned in connection with motivation to working collectively (cf. the CRIME method of resolving problems, training in the organization of meetings, etc).

It is important to emphasize the functions fulfilled in the endeavour for total quality and in turn understand the objectives of this type of training. Total quality does not mean producing perfect products in an absolute sense, but sharing the clients' demands for quality products combined with good service: particularly punctual delivery. From this it follows that aiming for a zero error margin (perfect conformity with defined and realistic demands), and aiming to eliminate anything from the system which jeopardizes this, has a beneficial effect for the client, on the time spent and particularly on the overall manufacturing time. If a batch of products is perfect, there is no need to reproduce them or to repair the faults; if deadlines are met in the production process upstream or between the production stages, productivity will also benefit. In summary, any initiatives aimed at raising standards should not be seen exclusively as an improvement to the quality of the product, but also as a means of gain in terms of total production time and subsequently costs to the company.

2.3 THE TRAINING IMPACT OF WORK: SPOTLIGHT ON THE PRODUCTION CELLS

2.3.1 DESCRIPTION OF HOW THE ASSEMBLY WORKSHOP OPERATES

As already discussed, the main organizational change in the production area has revolved around specializing production lines and units using existing machinery. The aim has been to find ways of arranging the machines so that a variety of orders, both in terms of quality and quantity, can be met. In the past, specific machines were positioned the length of a conveyor belt depending on the type of article being produced. When the product changed, these machines were substituted for others and were stored away in a

parking area for machinery. Approximately twenty operators stood around the conveyor belt carrying out one or two operations at a rate of some 400 items an hour. Each operation took less than 10 seconds. It goes without saying that the qualities needed for doing this job were limited to the motor and psychological ability to reproduce a repetitive movement: a type of work which the managers considered more suited to women than men.

Change has come through the creation of production cells, set up to correspond with the different types of products (dependent on the make of car). Each cell is subdivided into production centres or islands "dedicated" (expression used by the management) to either one or several similar products. The new organization has seen the removal of the carpet, the grouping of machinery at U or at L and the positioning of two operators on each production island. The operators must now be able to perform all the operations necessary for the assembly of a lamp (up to 70 consecutive operations) and are in charge of between three and eleven machines (work positions), each one with a different function (gluing, screwing, crimping, packing, etc.).

Moreover, the operator is responsible for the quality and the quantity of the items produced. At the beginning of the day or the week she receives a nomenclature, that is to say, a list, of the items needed to produce a complete batch. After referring to the list, each of the workers goes to fetch the components, performs the different operations and checks the standard (conformity) of the product at each stage. If she comes across a defect, she puts the faulty part into a red bucket for rejects. The latter are later collected and coded in the computer, either by the head of the cell or her deputy or, in exceptional circumstances, by the operator herself.

Each cell has a head, the former head of the chain. She divides out the work according to the demands of the assembly shopfloor manager. She checks that the work has been done properly and passes it. It is also the head of the cell who trains new operators on the job. In all her tasks she is generally helped by a deputy (formerly the "flier").

Operators are versatile within the cell, but this ability is occasionally also required for changing between cells. They must be able to adapt to a work position outside their familiar working area, depending on the orders. Instruction sheets are placed at each position partly in order to help new operators adapt quickly to a change of position, but also to demonstrate the meticulous organization to the outside auditors[5]. These notices set out in detail the different operations which have to be performed.

A typical working day begins by reading the list. According to their needs, the operators take a certain number of component parts. Every time they have used a batch of parts they note it down in a book specially for this purpose, that is, they enter the date, the reference number, their checking number and then they sign it. This procedure allows the items to be traced outside their area (traceability). A permanent visual check is made of all the parts and, every two hours, an auto check is carried out: this involves taking a series of measurements at particular points in the process (using a torque wrench or a calliper rule) in case a machine has become maladjusted thus having a detrimental effect on the conformity of the product. We looked at two cells (E and H) one of which (H) is situated away from the rest. This has come about because, in contrast to cell E, it is assembling cold products, i.e. without using an oven or a conveyor belt. This gives the operator enough freedom to work at her own pace, according, on the one hand, to the instructions and, on the other hand, her availability and workload.

5 Appointed by the car manufacturers.

By contrast the conveyor belt imposes its own rhythm (in the case of cell E). Let us try to paint a picture of what it is like working with a conveyor belt: the operator further on places a semi-finished product onto a particular cradle of the conveyor belt as it moves steadily along (e.g. onto every third cradle) -spacing has been determined by the methods department. The semi-assembled part must pass through an oven which sets the strip of glue holding the glass onto the mirror. This is known as hot assembly (compared to cold assembly). The next operator picks up the semi-finished articles which have passed through the oven and performs the final operations. Interrupting the rhythm inevitably leads to a delay in production which is reflected in reduced daily productivity. The operator therefore feels forced to stay at her work position. All the more so since changing the way work is organized implies that its conception and planning have failed. Methods analysts still only calculate manipulation time and micro gestures which they incorporate in the tables used to set the pace of work. But now the operators' time cannot be calculated in the same way as they have to check each different part, carry out the machine check, perform administrative tasks such as traceability and checking the list, in addition to spending time passing on and developing knowledge. Giving the production operators responsibility has the paradoxical effect of cutting across the work rhythm established by the methods department and imposed by the conveyor belt. The limits set by the system, therefore, have produced a certain feeling of frustration because a decision will have to be made between **maximum productivity and minimum quality** and **maximum quality and minimum productivity.** We are faced with an incompatible mixture of the principles of Taylor and Ford (time and motion and conveyor belt) and the principles of the so-called "post-Ford" strategy for quality.

2.3.2 Some topics arising from the work context

This part of the study represents a collection of topics which arose when interviewing various people in the company. However, there is no logical link between them; these are isolated points of reference.

Topic 1 – Responsibility and independence

In the case of all the people interviewed, the changes that have taken place in the company represent, first and foremost, an increase in their responsibility vis-à-vis their job. This new responsibility is seen in a positive light in as much as: "we are now taken into consideration", in contrast to the previous style of organization where: *"we were just a number"*. The majority of individuals do not consider the qualitative and quantitative responsibility connected with production as a stress factor. However, they do feel under stress because they lack the means required to produce a batch of articles which correspond to the demand for quality.

The feeling of working independently and being able to organize one's work is therefore discounted, particularly among the operators in cell E because, on the one hand, they are given real responsibility in their work, but, on the other hand, a strict rhythm is imposed by the methods department and the conveyor belt. As we have already discussed, the limitations of the system lead to a feeling of frustration. As the operators themselves admit, working without the conveyor belt (case of cell H), encourages really responsible production management with the possibility of making up for a delay or working faster in order to spend the time saved on other tasks or activities. It was particularly by taking advantage of these chunks of time that the operators in cell H were able, with the encouragement of the head of the cell, and afterwards by helping one another, to learn to use the computer to perform relatively simple yet new tasks (printing out self-adhesive labels at the beginning of the day and coding the quantities produced at the end of the day). In addition to the extra periods of time gained, the lack of rigidity between work positions

and work islands facilitates social interaction and thereby provides a learning dynamic. Spatially defined areas can be "trespassed" by one or several operators involved in a task originally destined to take place in another area.

Topic 2 – Determining external factors and the logic of the "quality" policy

Customers, such as Renault, Ford etc., come to audit sub-contractors like Lighting Vision Belgique in order to satisfy themselves as to the quality of the product and the production process. In response to external demands, the company has trained its personnel to leave proof of their checks and to formalize their work (working instructions at each position, notices about special checks and traceability, etc.). What we are seeing here are external constraints which have an effect on work organization.

In the present economic climate, there is no doubt about the crucial role of sub-contraction. Multinationals are leaving the management of variable and uncertain aspects of production, such as the workforce, to small- and medium-sized companies. What is more, the small- and medium-sized companies, engaged in fierce competition, must prove themselves through their image, their capacity for innovation and, above all, their capability to give the customer total satisfaction and bend to his demands. It is no longer a question of producing in such a way that production thresholds are exceeded (scale), but of varying production according to precise objectives (scope) imposed by the customer. Many companies have been unable to restructure in order to become more flexible and have gone bankrupt. The company Lighting Belgique is currently still in the process of finding new flexible stability which is focused on the now determining factor of quality. *"We have to prove that we can do no wrong"*, stated one of the managers. To sum up, the company aims to gain a better foothold in the market by investing in quality products and responding quickly to market demand.

The only problem is that this struggle for quality has certain side-effects:

- As we have already seen, the contradiction between maximum productivity and maximum quality leads to dissatisfaction which in turn leads to demotivation.

- The insistence on quality and training for quality leads to a certain feeling of depression among the operators who believe that they have always been conscientious.

Additionally, certain economic necessities force the management to use parts which do not conform to the criteria of quality which the operators have been taught[6], thereby leading them to regard total quality as a short-term affair.

In general terms, this policy based on quality is considered to be coherent and is, to a large extent, accepted by the workers. The consumer's position of strength, the introduction into the workshop of a commercial relationship between the worker and supplier and the worker and customer, the accepted importance of quality for guaranteeing the company's future, and above all the hidden implication of this, seem to herald a new socio-economic morality, that is, a new commercial morality. But does this new market ethic not obscure the division of power in the company (still the place where the unequal relationship between capital and work is crystallized), a division of power which previously represented the very basis of a class ethic?

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6 This in no way means that these parts do not meet with the customers' requirements.

Topic 3 – Material comfort

The physical environment is considered to be important, but not that important. Those questioned were rather dissatisfied with their material surroundings. This was especially the opinion of the workshop operators who are affected by noise from the oven.

The aspect that was mentioned most during the interviews was the increase in physical fatigue. Reorganization means that the operator must move around from one position to the next and is unable to sit down.

Topic 4 – Task definition and flexibility of supervision

The rules and specifications which govern work organization seem to be clear and well defined. In fact, there is not a prescribed list of tasks to be carried out but rather a set of objectives to be met. They determine whether a whole task is completed alone or in a small team (2 or 3 people).

The system of lists means that everyone knows what they must do and what is expected of them. Initially there was a problem in reading the lists. Workers were unused to the vocabulary, although it was describing well-known components (the list said "reflector", the operator says "mirror", etc.). Being able to ask the head of the cell means that a nebulous area can be clarified. The style of supervision given by those directly in charge is based on an exchange of information and explanation. In particular, they take a few minutes at the end of the day to appraise the work, evaluate the cost of rejects and provide information (at their level) on the strategies developed by the company (e.g. total quality), etc. The heads of the cells we met ensure the flow and availability of information. In summary, as far as our non-representative sample was concerned, the style of supervision seemed to be consultative and participative. The supervision and the checking of tasks and personnel seemed to be flexible.

Topic 5 – Encouraging new ideas

The management encourages individuals to take calculated risks in order to improve results and to suggest new ideas for work organization. For this purpose there is a suggestions box. The management rewards the best suggestions with a gift (e.g. a household appliance).

Some members of staff mention favouritism in connection with rewards and the selection of good suggestions. This feeling probably results from a rather vague basis for deciding what is good. Therefore suspicion is understandable.

We should also mention that account is taken of requirements an individual may have concerning his work, notably in allowing him to change, or ask to change his physical working conditions (moving a machine, ordering a sponge to put the mirrors on, etc.). These little "favours" indicate the recognition of workers as adult individuals, at the bottom of the ladder.

Topic 6 – Team spirit and the quality of personal relationships

Clearly, there is team spirit and cooperation between workers in the same cell. The operators talk freely in terms of "we", a "we" that is based on the limits of the cell. Most of the personnel, however, agreed that the feeling of belonging, in the wider sense, was lacking. This lack of unity takes the form of a game of "opposition" (this word is too strong) between internal groups. Team spirit has the tendency of deteriorating into clan spirit with the result that a distance has grown between the cells either because they are less

"developed", or because they are "alienated" from the management or because of the type of work they are doing. Nevertheless, we believe that it is because of the feeling of belonging that it has been possible to adapt to the changes. Exchanges which are based on mutual help and progress at work are encouraged by a style of relationship founded on a sense of solidarity and identity, or as one operator put it: *"If someone in the cell is late and someone else is early, you give them a hand."* It seems that the operators are not only motivated by the prospect of a pay rise or promotion, but also because they identify with work which is confined to a manageable space. However, we do not have enough information to go into depth on this fundamental question in the functioning of the company. It is very important to have good relations with colleagues at work. This is particularly true for the operators in the workshop cells, as can be seen from the results of the questionnaire on work values.

However, work reorganization is also equated with a deterioration in social life and friendly atmosphere at work. A market ethic (as against a class ethic) and the clan spirit mentioned above are, no doubt, connected with this. Many observations point to a growing feeling of individualism and "each one for himself", a type of individualism that is probably even more clan-like, and which was mentioned in connection with inter-cell versatility.

We should emphasize that the organization of time and space encourages this "perversion". Each cell is physically separated from the others and none of the break times coincide. The level of exchange between the cells is in direct proportion to the reduction in information flow and consequently in the opportunity for innovation and training[7].

Topic 7 – Involvement

The majority of interviews showed that people feel affected by the company's results and feel they have an important role to play in the company's success. This is probably linked, on the one hand, to the relative insecurity felt in terms of the viability of the company, which causes people to overcome this feeling of precariousness by getting more involved[8], but also, it is linked to the management's policy of promoting a sense of responsibility among the staff and systematically informing them of what is happening, particularly giving economic information: turnover, cost of non-conformity, price of components and the finished product, etc. By contrast, the financial incentive is almost non-existent for an operator "working at a reorganized work position" (only a few francs per hour more).

Involvement is also reflected in the operators' interest in understanding the whole of the production process, that is to say, both upstream and downstream from their cell. What is more, four operators have expressed the wish to visit a car factory. This can be taken as confirmation of their involvement and desire to understand the exact function of the parts. Thus there is a kind of recognition of a "system" which consists of interdependent tasks.

We should also mention an aspect which is generally omitted but which, however, cannot be denied: the personal satisfaction that comes with being closely involved with a high quality product[9]. Working on lamps for quality or luxury cars has a validating and

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7 Instead of launching a new enquiry, one can refer to the results of urban research. As urban sociology has shown, the economic success (among other things) of a town is linked in particular to the ideas which spring up and are put into effect through the possibilities for informal and fruitful exchanges and frequent and various forms of interaction which are engendered by the size, density and heterogeneity of urban areas.

8 It is, however, difficult to under-estimate the importance of unemployment.

9 Even if the prestige aspect has not been emphasized as a fundamental value.

motivating effect. Workers feel a certain pride in telling people outside work that they assemble headlamps for Fairer (fictitious example). On the other hand, manufacturing products for makes and models which are considered down-market is not very stimulating. During our interviews this was confirmed by the importance operators attach to the products they are making, and particularly evident among the operators in cell H who work on lamps for Aud, Ford and Jaguar.

Our analysis highlighted several different types of personality[10].

- "Involved workers": welcome the reorganization of their work space. For example, some see isolation on a production island, separated from other people by wire netting, as a positive thing which reduces problems caused through contact with others. For them, their working place represents an opportunity to enjoy personal and collective involvement and well-being;

- "Independent workers": perform their work as independently as possible yet at the same time keeping to the rules. They consider themselves rather distanced from the life of the company, although restructuring is seen as positive because it strengthens their independence and consequently their involvement;

- "Sociable workers": take an average interest in their work. They consider the work to be "more interesting than before", but miss the contact with their colleagues, and rather nostalgically regret the new, aggressive, demotivating atmosphere;

- "Indifferent workers": regard their work purely as a means of earning a living. Three people in twenty-five were indifferent.

2.3.3 Some of the effects of organizational changes

Firstly, organization into isolated islands has meant that the operators have round about them several different machines which are needed to perform the successive operations involved in manufacturing the product. We observed that carrying out different tasks (regulation, manufacture, quality control) has had a broadening effect on the skills and knowledge of the operators compared with the way production was previously organized. Of course, if one only considers the physical aspects, it is clear that some kind of routine soon sets in. However, we intend to show that other aspects have also become apparent, in particular, cultural dimensions which open the way to continuing vocational training.

In order to work as an operator, it is no longer enough to be able to repeat an operation indefinitely, or to keep up with a work rhythm which results in productivity in terms of quantity. Now it is necessary to offer many different qualities which can be summed up as follows.

- Firstly, mnemotechnical skills: that is, the ability to tackle complex tasks and to assimilate or reproduce a large number of operations[11].

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10 Our typecasting is vague and without sufficient basis and purely serves to provide another angle to an otherwise homogenous description of involvement.

11 Certainly, learning to use various machines and to perform a number of operations is the result of experience and habit, but the need to be versatile both within and between cells constantly gives rise to new experiences.

- Secondly, "moral attitudes" (J.M. Lacrosse and others, 1990): taking on responsibility while at the same time ensuring that the work is well done, using careful movements, and checking that the machines are running properly and that the components are up to standard.

- Thirdly, intellectual potential: that is the cognitive capacity for understanding and reasoning so that the technical system and its interdependent workings can be understood; also the ability to grasp elementary technical facts relating to products or machinery, in particular so that basic maintenance can be carried out or suggestions can be made on how to resolve any malfunction or how to improve the manufacturing process.

These qualities which are constantly brought into play, cut across two main skills.

- Technical skills: an understanding of specific machinery which is used to assemble lamps and of the working environment as a whole, knowledge of the different components of a product and of the finished product, familiarity with the various quality check points in the different stages of assembly.

- Methodical skills: an ability to tackle a complex job, following a plan (defined by lists) and to complete it successfully by organizing certain aspects of the work either alone or as a member of a team.

In addition to these qualities and competences, the operator must be able to work as part of a team and to find his niche within a new production process.

These aspects lead us to take a brief look at how work is becoming more intellectual. We are not referring to the introduction of a scholarly-type of intellectualism as is often put forward by managers and sociologists when they talk of the intellectualization of labour (knowing how to read, write, count, use a computer, etc.), but rather to a mental attitude which places importance on the intellect.

Work reorganization has brought with it diversification and versatility, which is in contrast to dividing work up between work positions where skills are based on repeated actions. Intellectualism is gradually emerging as a result of the rapid and continual change in stimuli (the rate of change in work positions, products, production centres, cells, colleagues). In order to adapt to new products, which obviously implies a large number of changes, the operator must be able to grasp the production process as a whole and how it groups together all the separate parts. Before moving across to work in another cell, the operator is already building up a mental picture of the common factors (machines with the same function, auto check required at such and such a point, how to fill in the traceability form, how to handle the components, etc.). By contrast we cannot imagine there being a similar emotional pull within all the working groups. Emotional distance is now adding force to the intellect. In line with Simmel[12] we would say that intellectuality is a defense mechanism of the emotional life against the manipulation, demands and uprooting effect caused by moving from one cell to another.

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12 Georg Simmel, "Metropolises and mentalities", in "The Chicago School -Birth of urban ecology", Y. Grafmeyer and I. Joseph, Aubier, 1984, pp. 61 to 77.

2.3.4 TRAINING IMPACT. STARTING POINT FOR A MORE SYTEMATIC ANALYSIS

Premise 1 – On the concept of "development"

The transfer of knowledge and expertise is seen by the operators, mostly those working in cell H, as "development": *"We are developing. We must develop. Others are less developed, etc."*. This is possibly the key to encouraging the worker to invest in the process of training. What is the significance of this concept? Where is it valid? Where did it originate? Was the idea of development already present in the previous method of working, or has it grown out of the reorganization of work and working areas? Are the effects of physically restructuring a complete industrial unit comparable to those described by Lévy-Strauss in the Bororo Company? Does the "Bororo principle" proposed by Paul-Lévy have industrial applications?

It is worth highlighting this principle because it could help to clarify the basic mechanisms of launching a "spontaneous" training process. Paul-Lévy puts forward the following premise: *"if you change the environment in which a group exists, you change the values and the social being of this group, and you make it receptive, malleable and susceptible to the values of those who are offering or imposing the structure and the norms of the new environment"* (F. Paul-Lévy, 1948, p. 30). Thus it establishes a causal relationship between change in environment and socio-cultural change. In industry, do we not talk about reconversion?

It would be interesting to measure the cultural differences between the members of cell E compared with those in cell H. While the latter have been fundamentally affected by the new organization and use of space, cell E has remained in the same place and is structured around the regular movement of the conveyor belt in one direction. Thus, the members of cell H have acquired a whole range of new knowledge which is more advanced than that of the members of cell E, with greater freedom in their work and in their use of time and space. The feeling of identity and solidarity between pairs sharing the same space is also expressed more intensely.

Consequently, as a result of organizational and spatial restructuring, a phenomenon of cultural integration and conversion is emerging encouraging *"the shelving of a working-class culture [...] which is shaped according to the demands of production [...] and society as a whole"* (ibidem).

Referring to research done by H. Coing on the subject of urban redevelopment (H. Coing, 1976), in particular on the effects of development on housing, the author of the "Ville en croix (Town in the form of a cross)" writes that attitudes with regard to *housing "are ceasing to be "working-class" and are becoming similar to those of employees, although in terms of their occupation, workers remain workers..."* (F. Paul-Lévy 1984, pp. 28-29). Could we not apply this statement to the question which we are studying in this research? The attitude to learning is no longer "working-class", but has become similar to that of "employees"[13] while at the same time in their work status (in terms of work specification) operators remain workers. Re-siting machinery at U or at L and introducing an abstract register, (lists, instruction sheets, Kan Ban, etc.), establish a new world "partially strange, which you have to get to know and for which you have to change" (F. Paul-Lévy).

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13 An attitude which we connect with the "middle classes" and which allows upward mobility, achieved by rewarding effort and learning.

Premise 2 – On self-respect

As we mentioned before, the operator sets the limits of his effort himself. He must therefore be interested in having responsibility before he can become responsible. He must be well disposed to understanding and to bringing his capacity for reasoning into play. Certainly, the concept of development is a motivating factor but it only really takes shape through social intercourse and through processes in which the individual is emotionally involved.

Approval, given as a mark of confidence, in the form of new responsibility, encourages moral and intellectual investment in work even more so than other incentives, while the idea of doing an interesting job which is less monotonous is more of an outside motivator. Discovering and using her existing qualities in her work is resulting, among other things, in the operator modelling herself on an example (the head of the cell or a colleague). During our interviews a large number of operators told us: *"if so-and-so can do it, why not me"*. This can only work, however, if the model is both visible and accepted and on the same wave length as the person learning. Without this socio-cultural proximity (alter-ego), the difference would produce lack of enthusiasm: *"if he can do it, it's because he's "different"* (has, for example, more qualifications), *so it's obvious that I can't do it"*. When we were talking to personnel we often came across the expression: *"I'm no engineer"*. However, sometimes this meant: *"You see, I'm no engineer, but I can still think, make suggestions, and do things worthy of an engineer"*.

There is undoubtedly an emotional aspect which comes into play when forming an acceptable image of the self (being more or less developed) upon which the operator will base her effort to develop. This image consists of two opposite reference points, the engineer and the packer: "we are neither packers nor engineers". Here we find the "structural definition of the middle classes" which is based on *"the refusal to belong to the group from which they originate and from which they wish to dissociate themselves because it is basic and coarse, and the desire to be associated with culture and polish. Although they do not yet belong to this group, they are moving towards it and endeavour to emulate it by learning the rules of quality judgement. This double negative is experienced in the form of a positive identity which is raised to a double affirmation: I am better than the people down there, and I am capable of becoming like the people up there if I make the necessary effort to follow established rules"* (J.Remy and others, 1978, pp. 266-267).

Development can be seen as the assimilation, or accommodation of the values of the dominant social group, values which reflect a certain universality which is emitted by the middle classes. In this sense, development is merely the facility to adapt, however, it soon becomes a value per se, while training becomes its yardstick. This premise seems all the more valid since the working classes are seeking an analogous relationship with the professional classes, who are, in effect, the middle class.

Premise 3 – On a social approach

Certain skills can only be accessed and acquired through apprenticeship. Such an apprenticeship may be formal and organized in such a way that it is clearly part of a training programme or is stated in the job specification. The person in charge of communication believes, however, that the essential aspects of training and the adjustment to change happen outside the training sessions although, according to him, the sessions are the motivating factor. In practice, then, learning is not always obvious and can take place during informal exchanges which are conditioned by the physical aspects of organization in terms of time and space.

Clearly the physical organization of the company has a part to play in the diffusion and the retention of knowledge. In order for the worker to explore, take risks, experiment, make new discoveries and experience new reactions, in the way we have described, a range of possibilities must exist: time and space dedicated to thinking, to the resolution of problems and to implementing the solution.

The flexibility of the perimeters between work positions and work zones, along with the extra intervals of time gained, encourage social intercourse and, as a result, a certain training dynamic[14]. Workers involved in one area can "trespass" into other areas. It is evident that the tools of communication (telephone, network terminals, etc.) facilitate specific links between the departments. Nevertheless, at operator level, physical space is the main link. Physical lay-out is in itself the main generator of surplus time. The way in which the company has been divided up into distinct working units, not to mention the need for versatility, means that allowance has been made for the time spent moving around. These intervals of time (time for moving from one place to another, coffee or W.C. breaks, return to the cloakroom, free time within the production process, etc.) are obviously very different in nature and would have to be clarified in order to ascertain how likely they are to lead to the transfer of knowledge. The freedom given to the individual to achieve his objectives in an exploratory way during the programmed break times represents a more or less "discreet" training process which is beneficial to both the worker and the company.

But the conditions of time and space are not enough to explain the flow or the retention of knowledge and expertise. Workers also respond to a work identity. The relative spatial separation does not necessarily imply mental or social isolation. As a result of the introduction of the production cells, newly defined areas create relationships relative to the space in question. The individual is integrated into a web of relationships, or into a working group, by virtue of his knowledge and expertise, as Fischer states, *"through the possibility he has of becoming familiar with the space; conversely, uncertainty of belonging can turn into uncertainty as regards his territory"* (G. N. Fischer 1986, p. 150).

The company therefore consists of many different territories which are either opening up or closing down, either communicating or competing to a greater or lesser degree. Different occupational activities are in fact expressed in terms of different territorial behaviour (support for various relationships and exchange of information). The surplus time associated with different territories appears to be a resource which the workers can use to resolve physical or communication problems, particularly in the case of exchanges between the cells[15].

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14 We have intentionally omitted talking about formal training situations which, because of their raison d'être, naturally provide areas for communication and training.

15 On the subject of time intervals cf. the article by J.Remy, "Time limits and time intervals: spatial structuring as a social resource", in The theory of human space, CRAAL-FNSRS, Geneva 1986.

3. COMPANY PROFILE OF S.B. BELGIQUE

3.1 GENERAL DESCRIPTION OF S.B.

3.1.1 THE COMPANY'S IMPORTANCE

SB Belgique Ltd. is a subsidiary of the multinational group SB, which itself came into being as a result of the merger in 1989 between the American company SK B and the British company B. This merger meant that the group had become large enough[16] to continue its increasingly expensive research and development programme (21 thousand million per annum for Research and Development with 5,000 scientists and researchers), and also to make its products known throughout the world (6,000 medical representatives). Well-known products are: "tagamet" which is an antibiotic used in gastroenterology and is the group's biggest seller, various antibiotics such as "augmentin" and "amoxil", not to mention the vaccines against hepatitis B and A which were developed by the factory at Rixensart.

SB has five plants in Belgium, all of them autonomous: SBP at Genval (distribution on the Belgian and Luxembourg markets of pharmaceuticals and vaccines); SBP of Heppignies (European centre for the production of pharmaceuticals); SB AH at Louvain-la-Neuve (unit for research, production and marketing of veterinary products on the European market and a unit for the marketing of consumer products - Aquafresh, McLeans, etc.); and finally SB Belgique at Rixensart (SB's world centre for research and production of human vaccines). In total the companies employ over 2,000 people, more than 1,000 of whom work at SB Belgique. The merger and the restructuring that followed did not lead to many redundancies in Belgium: according to a spokesman for SBP there were about a hundred. In fact, pressure on the personnel was eased by the "major development of the Rixensart centre, anaesthetized by the vaccines against hepatitis"[17]

3.1.2 HISTORY OF THE COMPANY

The present structure of SB Belgique is the successful culmination of a long development, marked by three determining phases:

- the company's foundation in the fifties under the name of R by the L family, proprietors of the G Paper Mills;
- the purchase of R. in the late sixties by the American company SK;
- its merger with the British company B.

A "biographical" study of the Rixensart centre amounts to an analysis of the company's successive medical achievements and their effect on the structure of the company.

The first vaccine to be produced by R. was the anti-polio vaccine, Salk, which was developed between 1955 and 1956 and was produced industrially at the end of the fifties. For the production of industrial batches the company acquired a castle at Rixensart and transformed the interior into laboratories ("the castle of the monkeys"). In 1959 other

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16 SK B's turnover in 1988 was 107 thousand million Belgian francs (of which 1 thousand million was attributable to Belgium), while B's turnover was 148 thousand million (1.8 thousand million was from the Belgian market). In 1990, SB's world turnover was 285 thousand million and it employed 50,000 people. Belgium accounted for 3.6 thousand million and exports were valued at 14 thousand million francs.

17 Analysis of a merger, Tendencies, 12 March 1992.

countries also began to produce their own vaccine and because of this the European market became more or less saturated. By 1960 only 10 of the 50 employees remained.

Research into the manufacture of new vaccines, particularly for veterinary purposes, required both more space and investment in technological equipment, for example the purchase of the first lyophilizer.

Consequently, new buildings were constructed at Rixensart which until then had seen only the establishment of the antibiotics factory (since 1958). Research and production activities could now be separated and better facilities could be introduced for animal research. At this time the number of staff had risen to more than twenty.

During the sixties the R company tried to become an independent European enterprise with subsidiaries in France (1960) and in the Netherlands (1963), and was attempting to establish itself in Italy and Germany. The workforce in R as a whole fluctuated between 500 and 600.

At the end of the sixties the company was trying to launch its rubella vaccine. But the capital required for the development and marketing of this vaccine was a major contributor towards the company's purchase in 1968 by the American group SK. This period, which some people regarded as traumatic, marked the beginning of a new era. It would, in future, be necessary to come to terms with the culture and politics of a new multinational group.

Towards the middle of the seventies discoveries in molecular genetics caused Dr. H. to bring together a group of researchers in this field. In 1978 the "Biological Division" was created. The financial success, slow but certain, from the promotion of these vaccines allowed the company to make investments in various departments: Research and Development, Medical, Marketing and general departments.

The management of the company promoted the work with vaccines, despite resistance from the group which regarded vaccines as "commodities"[18], and encouraged the trend towards biotechnology and genetics. This gave the Rixensart centre a specific identity and expertise that the other subsidiaries did not and still do not possess. This specialization led to the discovery, the production and the marketing of the thermostable vaccine against measles, the combined vaccine against rubella, measles and mumps and the vaccine against hepatitis B. The latter, Engérix-B, the most widely-used in the world, was the main reason for the growth of SB Belgique during the second half of the 1980s right up until the present day.

During the 1980s new departments were set up and existing ones reinforced, thus bringing the company into its present form. One of its specific aspects is the fact that all the necessary functions and skills are to be found on the one site: research and development, bulk production of vaccines, filling, warehousing, maintenance, quality control, human resources, commercial support, etc.

Each of these functions has its own semi-autonomous department, particularly independent from a financial point of view. The departments are physically separate but still come under the same roof. They work with one another on a customer/supplier basis. However, integration and cooperation are regarded as absolutely essential for the firm to face the constant competition from outside.

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18 Products which cannot be patented and are always liable to be superseded, imitated, sold or shelved.

This is a brief description of the development of the Rixensart unit which has become a world famous biotechnological centre, one of the few which has been able to develop and produce high quality human vaccines. The latest one to be launched, at the beginning of 1992, is the vaccine against hepatitis A. Thus, the future looks bright. The world market for vaccines is today estimated to be worth 60 thousand million Belgian francs, and will probably have doubled by the year 2000. According to the Vice-Chairman and Managing Director, J.S., future growth will be assured by three major products - the vaccines against hepatitis B, hepatitis A and combinations against whooping cough - and also other less advanced projects which are, nevertheless, moving along fast, thereby making the future look even more promising. These include a vaccine against chickenpox, herpes, a better vaccine against flu and possibly a vaccine to combat AIDS.

3.1.3 General policy, management of human resources and units analyzed

Marketing dictates the way work is organized; the customer is the determining factor. Market research, which consists of sounding out the market (for the long term), points the way for the financing of future research and production[19].

Moreover, internal organization, as currently experienced, is strongly influenced by external constraints (controls). In the pharmaceutical sector, legislation for consumer, environmental and employee protection - particularly in Germany, Great Britain and the United States - demands a whole series of Good Manufacturing Practices (GMP). Legislation relates to both the reliability of the product and to manufacturing processes. SB Belgique has also introduced a "Quality Assurance" department which precedes and duplicates external controls. This makes work easier for outside bodies and, in fact, provides the company with an advantage when trying to penetrate markets which are subject to rigorous standards.

Although Japanese management techniques (just in time, total quality, zero error margin) have been introduced into the company, they are not fundamental to its organization (in comparison with the automobile sector). In fact, in a company dealing with advanced chemistry, errors are unlikely to arise in the final analysis due to the frequency and high level of controls. Moreover, any "errors" made during the production process have little effect on profitability. The cost of the raw materials is negligible compared to the cost of research and development of a new product.

The area of human resources, however, has become a central preoccupation. The growth of the company is described by its directors as the work of a "collective company" and not that of one individual. The company is regarded as a "professional microcosm", that is: a diverse world brought together through interrelationships. This microcosm is based on a "concept of harmony". The company wants to represent a place where each worker can find a niche for himself which corresponds to his training, his experience and his capabilities. His position is not rigid in as much as an internal market must remain open. From now on, the company's policy on recruitment, training, communication and participation represent a major force in the way it operates.

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19 Marketing in the strict sense of the word (both in the short and medium term) is becoming a secondary feature.

A new management culture is in the process of development. It is based on the *slogan "simply better"* and has five fundamental values:

- performance
- the customer (customer service department linked to the quality of external exchanges);
- innovation (encouraging new ideas and initiatives aimed at improving everyone's performance);
- people (supporting relationships and agreements between the two sides of industry);
- "straight talk" (confidence, integrity, and constructive criticism).

There follows a table which shows the link between these values and the practices and initiatives[20].

PRACTICES	VALUES	INITIATIVES
Constantly looking for new challenges with a view to improving personal performance.	PERFORMANCE	TZAR programming in manufacture & distribution; systems of evaluating performance. Annual meeting.
Working with colleagues both individually and as a team so that new objectives can be set & concrete programmes developed in order to achieve ever higher levels of performance.	PERFORMANCE	MBO. Working groups. Planning groups. Internal auditing and GMP training. Computerization of QC. Monthly coordination meetings. Purchase price control.
Identifying & continually introducing the best means of forecasting, serving & satisfying customer requirements both internally & externally. Computerization of Research & Development. Accounting programmes. Continual progress towards maintaining deadlines.	CUSTOMER	PEP. Immediate support by Quality Assurance & Regulatory Affairs at Rixenart and throughout the world.
Stess the importance of developing and implementing new ways of improving practices, products and services of the company, through quality analysis	CUSTOMER	Welcome booklet for the staff. Ongoing audit by quality control. Changes in specifications. Harmonisation and annual revision of production procedures.
Having the courage to change yet remaining determined to gain & maintain a clear-cut competitive advantage.	INNOVATION	Egerix B.
Rewarding and recognizing important achievements which demonstrate creativity.	INNOVATION	English system for suggestions. Work forum.
Recruitment policy & individual development which demands a high performance level and potential.	INNOVATION	Management access programme. Projects for filling key posts. Training.
Helping all workers, employees & executives to achieve total fulfilment by matching their capabilities to the work required; this being possible thanks to efficient training & support systems in the areas of quality and performance.	PEOPLE	QC & GMP training. Safety Communication & man management.
Openly communicating with all other colleagues on a reciprocal basis & for the length of time required.	STRAIGHT TALK	Management board. Committee for dialogue between executives. Personnel procedures. Open days. Introductory seminars. In-house journal. Information days.

20 The table is extracted from the "Trait d'Union", the staff journal published by SmithKline Beecham, of 15 December 1991.

We shall now present a study of two departments: the warehousing department and the filling department. The former was the subject of reorganization aiming at versatility, while the second, in contrast, has organized its operators according to the previous task system which is not based on versatility.

First of all, it is worth mentioning the company's policy on versatility in relation to the workers. The company places even more emphasis on versatility than the trade unions. Faced with the prospect of structural development marked by the advance in technology and rising standards, the management believes that the workforce is becoming more and more strategic. Indeed, it is only with the help of people that machinery can be made to function at an optimum level, and high quality production can be achieved (this is also linked to the efficient running of machinery). However, repetitive work has already been, or is in the process of being, transferred to the third world (where the cost of labour is minimal). Alternatively it has been replaced by automation. Taking this into consideration, versatility and making the operators tasks more interesting and more varied are seen as a direct means of motivation (indispensable for achieving quality) and as a means of cutting back the workforce[21] (as a consequence of technological modernization), while at the same time securing core jobs for part of the personnel who must be able to carry out more than one basic activity ("simplified" through technique) - i.e. versatility.

The management say that even if unvarying work does not disappear completely, it will mostly be performed by part-time workers. For this reason, versatility ensures a certain security of employment. Of course, working at several or changing work positions raises the following question: "What preparation is required for an occupational qualification?" Probably being adaptable to change and capable of learning.

3.2 THE WAREHOUSING DEPARTMENT

3.2.1 GENERAL DESCRIPTION OF THE DEPARTMENT

The warehousing department consists of three cells which function independently:

- the "import" cell (also called the reception/distribution cell). It represents the collection point for batches of component parts, stock and transfers to internal clients (users). The warehouse manages the component parts for bulk production, filling and packaging;

- the "intermediate compounds" cell (CI). A large proportion of what is produced on site is brought to the central warehouse, or more exactly, to the "CI" cell. These products are stored, depending on their nature, in refrigerators (+4 to -25 °C) or at an ambient temperature, and then distributed to other producers. Thus, while awaiting orders from the two packaging departments, the non-labelled bottles or tubes which arrive from filling are kept in store. The "CI" also keeps the "archives", that is the samples which are representative of each product, for a minimum period of ten years;

21 A reduction which will not necessarily be carried out because of the possible enlargement of the company

- the "export cell". The packaged vaccines arrive at the export cell where they are prepared according to their various destinations. On the day they are sent off, a series of specific operations have to be performed, depending on the standards laid down by the customers (particularly the addition of thermometers). Certain vaccines require carbon dioxide snow and refrigeration. Thus it is the "export" cell which takes care of the final preparations.

These three cells cover around ten functions which the warehouse-men have to fulfil: reception, in the strict sense of the word, the preparation of orders for bulk or filling or for packaging, the distribution of the products on site, checking the arrivals and departures of intermediate compounds, checking the finished products for export, etc.

Currently the warehousing department is operated by 16 workers (men), 11 employees (of whom two are women) and 1 executive[22].

One director is responsible for:

- transport, particularly by air;
- the plant at Genval;
- the intermediate compounds;
- the reception/distribution cell;
- direct orders (without storage);
- export;
- orders from packaging;
- cell S3, an annex cell which handles all the items which are not part of the production process (safety shoes, cloths, cases, etc.);
- the articles produced, apart from the packaging;
- the movement of lorries (entrances and exits).

Each of the employees responsible for one of these areas, is in charge of one, two or three warehousemen. The number of workers varies according to the amount of work and to what extent people can be moved around.

We should note that as a result of its economic growth, the company was faced with a lack of space. Stock grew so rapidly that the company had to rent a warehouse and a refrigerated depot outside its premises. The "CI" cell, previously attached to production, was added to the warehousing department and also to a warehouse at the Genval plant.

3.2.2 ORGANIZATIONAL CHANGES

Over the last few years (1989) the warehouse manager has introduced a concept of versatility based on the way his previous company was organized. Originally there was no versatility between the cells. Each warehouseman was involved with only one type of product.

Reorganization was prompted by difficulties caused by absence. In fact, each warehouseman had his own way of working with "his" stock. It was therefore difficult to replace him because *"he was the only one who knew where his products were: those were the days when people were indispensable"*. Before the idea of versatility could become fea-

22 By way of reference and documentation, in 1986, there were 11 workers and 7 employees in the warehouse.

sible, the various stages of work had to be rationalized and formalized according to the MAG procedures which described all the functions as set out above. The idea of versatility does not only apply to the workers, but also to the administrators where one member of staff can replace another.

The development of versatility has been accompanied by technological modernization, namely the introduction into the company in 1989 of the computer system TZAR and the purchase of three refrigerators with automatic, numeric facilities for reordering new stock.

The TZAR computer system acts as a sort of communication network between the company's different departments, allowing rapid and unobstructed communication (suppliers and internal customers). The software is mainly used by the executives and supervisors. The comment of one of the warehousemen on the subject of computerization was: "We look after the stock in physical terms, the bosses manage the stock via the computer". By contrast, the fridges are used daily by the warehousemen. The first fridge was installed in 1988. It does not have an integrated management system, that is to say, someone has to 1) place the pallets on the conveyor at the entrance, 2) select the "entry" option on the computer screen by typing it on the keyboard, 3) the computer indicates which of the 222 spaces are free, 4) a number which corresponds to a free space is selected, for example, location 33, and 5) the robot inside the fridge moves the stock to the position indicated. This system requires the person in charge of the cell to code the storage and removal of stock himself. For this to happen, the warehouseman has to type in the position number and general information such as the item, batch and quantity.

The last fridge to be installed in 1991 simultaneously registers the physical entry and exit of batches and the input and output of data onto the computer file. In fact, in the case of goods being stored, the handler 1) puts the pallet on the conveyor at the entrance, 2) selects the "entry" option, and 3) follows the instructions given by the computer. The screen then displays spaces for 4) entering the item and batch number and the quantity. Once this has been done, the robot puts the pallet into stock.

According to the management, the advantages of automation are:

- higher productivity: 1,300 pallets can be handled by two handlers and one supervisor (otherwise it would take a minimum of four warehousemen);
- better stock management: the reliability of the robot together with a complete overview of the location of stock are important bonuses when it comes to external audits, particularly in the case of intermediate compounds (non-labelled vaccines);
- extension to the height of stocking (as much as 17 meters);
- improved working conditions: handling stock in the fridges at temperatures between -25 to +4 is not only difficult but also leads to occupational illnesses.

It is difficult to find disadvantages. The high cost of the equipment is more of a constraint than a disadvantage. However, there is a long term depreciation which assumes that the present economic situation will be maintained.

3.2.3 TRAINING PRACTICES

There is no course of education which prepares people to be warehousemen. Initial training is generally at the A4 and A3 level (vocational education), but, according to the

managers at the recruitment centre, the levels of education currently required are A3 or even A2 (secondary technical level) because the work has become more complex.

Formal training

As far as the warehouse workers are concerned, the formal training offered and/or required comes under four headings:

- training for fork lift truck operators;
- GMP training (Good Manufacturing Practice);
- safety training;
- English language training.

Training as a fork lift truck operator consists of learning to drive a vehicle which transports the pallets. Training is given by a recognized outside firm (A.I.B.), but the company stipulates that training is essential. In fact, anyone applying for the job of warehouseman must first have passed physical tests (reflexes, hearing, sight) and psycho-technical tests at the A.I.B. centre in Brussels, where it is established whether or not the person is suitable to be a fork lift truck driver. Then trainers come to the company through the safety department to teach the "apprentice" warehousemen the rules of driving these vehicles. Later they come to observe and evaluate the work together with the warehouseman. A fork lift truck driving licence is then awarded.

GMP training is specific to the company and is given in-house either by a manager from the warehousing department or by the quality assurance department. It consists of learning good handling practices, in particular how to handle products without damaging them. GMP is to be found throughout the company with varying content according to the activity (bulk production, filling, packaging, storage). It should be noted that while GMP courses are specific to the company and to the different departments, the type of training and its general content are found in all pharmaceutical and food companies which are subject to strict, external regulations. Here there is also an element of transferability.

Safety training is fairly basic. It fundamentally consists of teaching workers how to lift heavy weights without hurting themselves.

Until now no-one has shown any inclination to learn English. We were told that even if the technicians and workers were to apply for training, their application would stand little chance of success as the company reserves this area for executives.

Informal training

In addition to formal training, a vast system of informal training begins the moment a new person is recruited into the department. It is not until the end of this period that the latter is recognized as a warehouseman "by cooptation" by his colleagues and those in charge.

During his probationary period (3 to 6 months), the new recruit is responsible to the head of the cell. He is delegated a simple and precise function. In order to help him, he is given a copy of the operational procedures which he must read and understand with the help of a few explanations. Generally, a trainee warehouseman is given the job of receiving orders and delivering them throughout the site. All the stages of the work are explained in the procedures and reinforced through clarification and advice given by one of the workers who has been there for some time. Working as a delivery warehouseman gives the trainee the opportunity of getting to know the different areas of the company. Gradually the warehouseman learns to receive and deliver the goods alone and then, over a period of a few weeks, he extends his work to include other jobs, still with the help

of an experienced colleague. It should be noted that the training function is not mentioned in the job description of workers in the warehouse, but those people interviewed gained personal and social satisfaction from their training function (prestige).

Those in charge and also the warehousemen themselves consider that a new recruit must spend about 6 months in a cell before he can master all the tasks and rules involved. Each vaccine requires special conditions for its storage and dispatch, every country has different regulations. Thus inter-cell versatility requires a minimum of one year's training on the job[23]. A trainee warehouseman is judged by how much work he can do, compared with what is required of him. Obviously he can judge this himself!

3.2.4 STUDY OF THE TRAINING IMPACT OF WORK

The work of a warehouseman in the export cell

In order to provide a full understanding of the work, we shall describe a typical situation.

The person in charge of the cell gives the warehouseman a file e.g. an order for X vaccines for country A. The warehouseman takes a batch, Y, (Z+Z) of packets out of the fridge, counts out the number required and returns the rest to the fridge. The quantity of vaccines which have been taken out is rearranged, weighed and numbered. After that the warehouseman stores the prepared batch in the fridge and gives the completed file back to the supervisor. The latter enters the data onto the TZAR computer system and communicates the original to the traffic department. The traffic department, in return, informs the cell of the date and time of departure together with all the dispatch details such as labels with the addresses, regulation details (tests carried out on the vaccine), whether or not thermometers and carbon dioxide snow are required.

Every morning the head of the cell gives the warehousemen their daily assignments. They are responsible for organizing their own work. In order to do this, each worker must look at the computer listings[24] to check the different standards depending on the customer and the country, e.g. size of the boxes, conditions required for dispatch, which type of thermometer. It should be noted that there are 17 types of special thermometers depending on the country, and, in addition, some countries demand two thermometers.

In the case of an emergency, the warehouseman refers it to his boss and they try to find a solution together. Most of the time the more experienced warehousemen can solve the difficulties that arise themselves. However, we did come across a situation which required calling the supervisor. Part of a batch that was to be dispatched that very day was damaged by a leaking water pipe. The worker, who decided that he could not send off cardboard boxes that had suffered water damage, reported the matter to his superior. They agreed to repack the vaccines manually and stick on hand written labels. At the same time the warehouseman had noticed the reason for the leak and had put forward suggestions to prevent its occurring again. This showed that the warehouseman was self-reliant until the point where the situation became difficult. He then analyzed the situation, pinpointed the problems, understood what had happened and decided what action was required (including speaking to his boss).

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23 Does this not challenge the economics of taking on ONEM trainees and giving short contracts when what is needed is a stable workforce.

24 Officially workers in the warehousing department are supposed to use the computer except for putting pallets in and out of the automatic fridges. However, some workers are already capable of consulting the computer for their daily work, without, however, becoming involved in coding. The company's policy of limiting the use of computers as much as possible to employees, is justified because they fear that the workers will claim employee status. Some people believe that policy on employment is moving towards giving everyone employee status.

Notes on certain aspects of employment

1) Responsibility and independence

It is often said that a sense of responsibility and independence are essential qualities for a warehouseman. They are attractive aspects of the job. This can be seen in the histogram on occupational values (shown in the research report), by looking at the importance given to the "independence" value which appears in the first five choices. Thus the necessary procedures are not regarded as a restriction to individual work organization but rather as a reference point from which freedom and initiative spring.

Reference is often made to responsibility in the export cell because that is where the buck stops in the production process. *"We pay cash for any mistakes! After us comes the client."*, said one of the people we spoke to. At this point everything is double-checked.

The word "we" refers to the group. Responsibility is not only felt at a personal level but also within the cell where it is interesting to note a certain solidarity among the warehousemen, who, whether justifiably or not, feel they are not acknowledged in the same way as other people in the company. The cell must therefore demonstrate the high level of its responsibilities.

2) Definition of task and role

The formal definition of the work to be carried out (the task) converges with an understanding of the extent and the limits of responsibility (the role). The content and the demands of the job are thus distinct which means that everyone can adjust his approach to meet the company's needs.

3) Physical environment

For the purposes of our study, it is useful to note the effect that "tight space" has on the organization of work. In fact, the shortage of room in the warehouse forces the supervisors and the warehousemen to use the space very economically so as to avoid internal blockages (e.g. pallets and trucks obstructing the corridors or lorries blocking the space outside). Thus, concrete work conditions influence the way in which the warehouse is organized, and leave the staff no option but to work methodically.

4) Team spirit and the quality of personal relations

Relationships with colleagues at work are not a great priority. Indeed, a warehouseman usually works independently. This does not mean that he has no personal contact with his fellow workers. However, such contact does not appear to be promoted by policies which encourage group work or the development of a team spirit. On the contrary, versatility tends to restrict emphasis on the cell or its members. In this respect personal ambitions take precedence over team spirit, particularly since the warehouse is increasing in size and internal promotion is always possible.

Lack of space in the central warehouse and the flexibility of each cell encourages or at least makes contact easier. But these contacts arise through natural affinity rather than because they are imposed by proximity or tight space. Mutual help and the transfer of knowledge and expertise appear to be based on elected friendship.

5) Encouraging new ideas

We note that within the department there is a GMP committee where workers can state their needs and put forward viewpoints and new ideas on the way work is organized. Employees, on the other hand, take part in production meetings.

6) Involvement

Involvement seems to be connected with finding a job which is motivating and interesting, as is shown by the importance given to the value "achievement" in the questionnaire on occupational values. Particularly in the case of young people, the very fact of gaining experience in an area for which they were not prepared, encourages personal investment in their work. Our interviews emphasised the interest people have in their work and its training impact. Naturally, motivation is always financial (SB Biologicals pays its workers well), but it also stems from the individual's "responsible and independent" management of his own work pace.

3.2.5 CONCLUSION

In our conclusion, we shall proceed by presenting consecutive arguments.

Reconciliation between competition and communication

An accepted idea of a warehouseman's job emerges when dealing with other departments. This concept is based upon the key position of the warehouse in the overall running of the company and the perceived responsibility which is associated with this central position. We therefore believe that the management of goods coming in and going out, puts the warehousemen in an unquestionably strong position, without them even realizing it. Their distinct power is reinforced by the fact that they are small in number, they are grouped together in a restricted space and they are therefore potentially very mobile. Moreover, the warehouseman's position in the company is stable and protected, because there is no recognized training path leading directly to the job. Also, a warehouseman has to train on the job for several months[25]. One is immediately aware of the latent power present in the situation.

Therefore, competition within the department (personal ambitions over-riding team spirit) and the diversification of skills have considerable influence on the running of the company. There is no contradiction between the collective viewpoint (based on communication) and the individual but dialectic viewpoint (based on competition). Communication and competition are fundamental social processes which ensure the overall continuity and success of the operation, possibly to the detriment of one of the parties and the potential for training and innovation.

This last observation signifies that we interpret the resulting situation as unintentional rather than Machiavellian. Without giving way to organicism, the company is influenced by directing forces which contribute towards its existence without the knowledge of those individuals who are the motivating factors. The challenge to the individual and the manager is to harness these forces and either encourage them or confront them with other forces in the name of increased efficiency and "progress".

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[25] It would be interesting to analyze the relationship between the length of training for a specific task in the company and the corresponding level of security of employment. Different variables, such as salary, sex and automation, have an influence on this basic question.

From training to routine

The warehouseman's skills are developed during working hours at his work place, with the goods before him, through innumerable small exchanges with his colleagues (including the bosses) which it is difficult to formalize. Given this situation, a department encouraging communication rather than competition is more likely to provide the necessary conditions for continuing vocational training. At the present time, the relatively strict division of labour between employees and workers in the warehouse together with the existing possibilities for promotion mean that after one year's work training potential has been exhausted, routine sets in and the warehouseman can develop no further. Even if the warehouseman has not acquired all the skills in an empirical fashion, he can understand the logic and the procedures which enable him to work in differing situations. Increasing the scope of the warehousemen's work by means of communication and training, to the point where they could use computer programmes, would be a way of promoting skills. However, extending and enrichening their work would have repercussions in terms of claims for higher salaries and enhanced status.

Versatility and the training impact of work

Versatility, which was introduced to combat the negative effects of absenteeism, has resulted in an increased amount of time being spent on in-house training, and a greater emphasis being placed on introductory sessions. There have only been a few major changes in terms of the qualities and competences required, one being the ability to step back from concrete work situations. This distance consists of developing a mental picture of the operating processes involved in each individual work situation.

Since these parameters remain stable, they have been formalized depending on the relative process: type of vaccine, veterinary or human, bottles or tubes (3 ml, 10 ml or more), liquid or lyophilized, storage temperature (+4, -25 or ambivalent), customer's dispatch instructions, etc. Thus the content of the work has changed, but its form remains the same.

This is not so much because of the organization factor (versatility) but more because of outside constraints - in particular the growth of markets, the diversity of the products and the dispatch instructions and checks - all of which have an influence on higher standards and new skills. In fact, the increase in volume demands better organization (one of the reasons for purchasing automatic fridges), and, as far as the workers are concerned, a more methodical approach than before. Although this particular skill of being methodical is closely connected to the act of working, it is developed in formal training establishments, notably in schools. Changes in employment criteria, show that recruiters are taking this into account. In the old days warehousemen were not required to have any qualifications ("Pulling a few trays in and out is not very demanding!"). Nowadays at SB most of the people employed, have a technical qualification (formerly known as A2). In the selection process, the level of training is more important than the content of the certificate. An electro-mechanic employed as a warehouseman will not become involved in either mechanics or electrics, but his training is considered to reflect a technical mind, i.e. a methodical way of resolving a problem, and therefore an open mind. As reliability and quality become more and more essential for both internal and external deliveries, responsibility, care and attention are becoming crucial qualities. What we are seeing is a broadening of the "moral attitudes required" (J.M. Lacrosse, C. Maroy, M. Molitor, 1990). The warehouseman must first and foremost "be responsible", i.e. be aware of the potential consequences of making mistakes. In this connection the people interviewed stated that the worst thing that could happen is losing a market for the company. When taking into account this enormous risk, the need for care and attention are obvious.

In summary, the motorized transport of the pallets and the automatic fridges have made work easier. By contrast, the increase in the volume of stock, the number of external constraints to be taken into consideration and the recently introduced intercell rotation, all mean that the content of the work has become more complex, requiring the ability to think abstractly, to be methodical and to have a more responsible attitude towards work.

3.3 FILLING DEPARTMENT

Filling is the stage where long series of bottles and tubes of vaccine are filled in the "bulk" department. The department employs 82 people.

This case study shows a return to a situation in which the operators remain relatively static, involved in a system of tasks, in contrast to the initial situation of job rotation[26].

3.3.1 GENERAL DESCRIPTION OF THE PRODUCTION PROCESS

The filling process consists of three, consecutive stages.

- The preparation of the material which will contain the product (there are two types of container: tubes and bottles). Preparation involves washing and sterilizing the bottles and tubes before sending them to separate sterile areas or putting them into sterilized compartments.

- Filling and the operations needed to preserve the vaccines. Filling is carried out in sterile areas. This stage varies according to the two types of vaccines: liquid or lyophilized. Lyophilization by cooling or heating is the stage between filling and capping the bottles. The filling areas are separate from each other in order to keep the products isolated and thus avoid all contamination.

- Capping, mirroring (controlling the particles) and organizing into batches. Once the bottles have been filled, and in some cases lyophilized and corked, they are sent for capping.

3.3.2 ORGANIZATIONAL CHANGES

Initially work was organized on the basis of general versatility. All the operators had to work at all the work positions in turn. This arrangement meant that problems of absenteeism could easily be overcome. However, people did not prove to have the necessary knowledge or command of the machinery. Consequently, when anything went wrong, they immediately called in a mechanic. Versatility as a general policy also created a management problem (the constant reshuffling of 80 people) and a time management problem.

A new idea was introduced in 1990 which consisted of maintaining personnel on a range of machines. In real terms, workers were divided into four teams: 1) a line for small 3 ml bottles - sorting and capping, 2) a line for large bottles, 9 ml or more, sorting and cap-

[26] This case study is somewhat different and less important than the others. In fact, it results from an opportunity that arose to examine the filling department at the time when we were preparing our study of the warehouse department.

ping, 3) line for sorting the tubes (two teams), 4) in addition to these four teams we should add a team for special work. The latter are generally attached to the operators who fill the tubes.

One of the filling stages takes place in a sterile area. Working in the sterile zone is restricting since it requires personnel to wear special suits and to handle the products very carefully. It is only possible to work for four hours at a time under these conditions. Reorganization must take account of this factor. Thus, one part of the team is involved in the production system and works in the filling area while the other part is working on the capping and after four hours they change round.

Since the teams were introduced and personnel has become less mobile, the job of cleaning the work positions and machinery has been included as one of the production tasks. Each team is therefore responsible for its own working area.

Groups are composed according to skills and three particular criteria relevant to the tasks involved and the use of the machinery. Two criteria are particularly important. Firstly, dexterity, so that the bottles and tubes can be handled efficiently[27], and secondly, the capacity to understand the technical functioning of the machine so that the operator can act swiftly and rationally if the machine develops a fault. Operators are therefore selected objectively according to dexterity, cognitive capacity and perception. Of course, whether this objective selection is successful or not depends on how the operators themselves react, but the lines demand a minimum of qualities since the management is trying to introduce equality of status.

It should be said that the introduction of teams has caused a clan spirit to develop among the workers. Envious comparisons are aggravated by a bonus paid to those working in the sterile zone. As a result, operators doing specialized work outside the area (cleaning, checking the standard of the caps, etc.) are disadvantaged, and yet, the management considers them equally important, particularly because of regulations laid down by the FDA (the American Food and Drug Authority). Recognition must be given, but not in terms of financial reward!

It took two months of trial and dialogue with the unions before the workforce would accept the reorganization. Accepting the occupational changes was not very difficult because previously people had been accustomed to work rotation. Besides making planning easier, the advantages of making workers more static quickly became apparent to the company and the workforce: an increase in the hourly rates coupled with less stress in the production process (because volumes did not automatically increase), and better handling of minor technical problems. On the other hand, certain machines were not used so much, in particular those for tubes, and the clan type attitude crept in.

It should be mentioned that reorganizing the workforce in no way changed the supervisory structure; supervisors remained responsible for a production line.

3.3.3 A TYPICAL WORKING DAY

A complete working day which runs between 6 a.m. and 10 p.m., is divided into three parts. It is strictly controlled by formalized procedures.

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27 When recruiting, the management prefers to select people who hold a qualification in sewing or hairdressing (A4 or A3) because they believe that achievement in these areas demonstrates a facility for precise and careful movements.

The first team begins work at 6 a.m. Team A starts up production and works in the zone until 12.30 p.m. During the whole of this time, from 6 a.m. onwards, team B is fitting caps. They break for lunch at 11.45 a.m. while team A continues production. At 12.30 p.m. the first worker in team A meets the first worker in team B and passes on the necessary instructions for taking over production. Team B then continues production until 4.30 p.m. After the lunch break, team A takes over the capping. At 2.p.m. a third team arrives. It generally consists of temporary workers (because of the shift times). These workers are either used to double up on production (learning the work) or to carry out special cleaning or checking jobs, etc. At 4 p.m. this team breaks for half an hour and then takes over production at 4.30 p.m., that is when the other team finishes its working day.

Thus the different teams overlap. To some extent this complicates the organization of responsibility but on the other hand it provides an opportunity for communication between the teams.

3.3.4 TRAINING PRACTICES

There is no schooling which trains people to become "filling" operators. It is therefore necessary to train the individual within the work situation. Training covers a three month period (probationary period) and aims at job versatility. Training starts outside the zone with simple jobs (cleaning, arranging bottles, sterilizing the contents, preparing material, etc.). Gradually the new worker is introduced to working with the machinery which requires more concentration. Training in the zone begins when the new recruit has shown some aptitude towards different basic tasks - generally after a three-month period. Working outside the zone presents no risk of contamination, while products in the zone are sensitive, thus requiring careful handling. For this reason the new worker stands in for a colleague and is evaluated by the first worker and the technical supervisory staff.

Alongside this informal training process, three elementary types of formal training are given.

- General training is given by the quality assurance department. They deal with the subjects of safety, contamination and sterilization.

- Continual in-house training is given within the department by management or supervisors. Generally it consists of reading procedures, reminding workers of certain precautions they must take (e.g. not to move your arm above open bottles), etc.

- Occasional training sessions: from time to time training on the vaccines is given by the production director of the filling department.

Since February 1992 visits to different buildings in the production area[28] have been arranged, partly to introduce the operators to the system of organization and partly to satisfy their curiosity. Knowledge of the company's different functions is also part of a policy of promoting the company's importance, that is to say, *"enabling the personnel to explain to outsiders what the company does"*. Half a day a week (Wednesdays) is allocated to different types of training.

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28 Three areas where vaccine is prepared, one sorting department and one packaging department.

3.3.5 TRAINING IMPACT OF WORK REORGANIZATION

In addition to physico-biological qualities, such as dexterity and perceptive discrimination, which are fundamental to the formation of teams, we are also seeing an increase in "moral qualities"[29]. Traditionally, managers required staff to demonstrate the will to work (some might say courage) along with care and common sense. Since the reorganization, executives expect, above all, for operators to show themselves vigilant and responsible. In this instance, the word responsibility is used in a specific connotation; in principle it means being aware of the consequences of any malfunction. The responsibility of the operators is all the greater because faults only appear after a machine has been made. From now on a sense of responsibility goes hand in hand with a vigilant attitude towards the quality of the work performed by the machine. Consequently operators must watch out for defects in the equipment (not the personnel) and must guard against any problem which could bring the machine to a standstill and make it unproductive. We were present when a capping machine (known as the stroumph) developed a problem, proving that the operators must constantly be checking production. Aiming at quality means that they must not become distracted or allow faults to slip through the net which will later reappear as rejects. Nevertheless, these moral attitudes lead to a certain technical understanding of the machine, although the understanding is not expressed in concrete terms: *"we know where the problem is"*, still means that the maintenance technician will come and solve it. To be precise, being vigilant is tantamount to watching out for anything which could reduce the machine's efficiency. In the final analysis, the responsibility and vigilance inherent in work reorganization are designed to meet two major imperatives: the optimization of fixed capital and the quality of the product. These two imperatives underline the strategic nature of the workforce.

As far as work organization is concerned, this department has not developed further than a Taylor-style organization. The division between design and production is identical, there is a marked hierarchical structure and knowledge is concentrated at the level of production and maintenance technicians.

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29 cf. above

PART THREE

CONCLUSIONS

J. Delcourt
B. Fusulier

1. CONFIRMING THE THEORY

Reason must prevail when attempting to draw conclusions from a small number of case studies. In reality, the situation is never straight forward; case studies are but samples. However, they do raise a number of questions which beg to continue the research rather than to bring it to a conclusion, since the very process of research opens up new horizons and invites further enquiry, and yet, a conclusion is demanded.

This research has brought to light various aspects of the dynamics of training. Direct observation has given us a better understanding of the way in which companies work, the organizational changes which have taken place and the new qualities and competences which are required. One or two theories also emerge from our conclusions along with clarification of certain fundamental areas of hitherto vague understanding of the practices, techniques and incentives employed in the field of training.

Our conclusions do not aim to provide a synthesis which details all the developments described in this report, nor to exhaust their heuristic value, but rather to use them in developing an argument in response to the questions that are raised concerning the new training patterns in companies which are somewhat removed from the principles of Taylor and Ford. From this point of view, there is considerable contrast between the cases studied in chapter 2 where work remains very segmented, except perhaps at "Sudcases" where the division of labour seems to be more imaginative, and the cases presented in chapter 3 where division of labour according to work position has been abolished and there is a move towards versatility for the operators.

2. NEW STYLES OF WORK ORGANIZATION: A ROUTE TOWARDS TRAINING AND QUALIFICATION FOR EMPLOYEES?

All the companies presented in this report are involved in industrial activities of a fairly traditional nature. In the majority of cases, we were concerned with the changes which have taken place in the skilling and training of workers and operators at the bottom of the professional ladder where learning on the job and through the job is significant.

But, contrary to what one might believe, changes in organization and skilling are not principally brought about by technological advances. It is more often than not the launching of new products and the opening of new markets which has prompted organizational change. Depending on the case, the company wants to make new chocolate products, launch new lines in luggage, produce a wider range of models, serve an increased number of markets, distinguish itself by the quality of its work, its product or its reliability..We shall come back to this point.

In accordance with the theory upon which this research is based, and in those sectors of industry and commerce where there are new styles of work organization which are to a greater or lesser degree at variance with the standard characteristics of Taylorism, we have established the following:

- firstly, an increased demand for "competences" based on technical knowledge, the ability not only to do something but also to communicate about it, good memory, an ethical attitude towards care and responsibility, the cognitive capacity for understanding and reasoning. In part, these competences can only be defined and acquired by actually doing the job, as is particularly the case with work in the warehouse at SB and the production cell operators at Lighting;

- secondly, new opportunities for acquiring these competences by routes which are not necessarily formal, since the work itself includes the need to analyze situations, to make diagnoses, to communicate upstream and downstream in a fairly formalized way, thus developing a more flexible relationship between the worker and the machine which takes the immediate pressure off production time, and provides periods of change-over time.

An organizational pattern is emerging in which the operators' role is both more strategic at production level and hence in terms of the company's results, and also more significant when it comes to taking part in the decision-making process and the application of their competences.

It is, at first, rather surprising to note that these forms of work organization are clearly marked by a market ethic. This is no doubt because following a socio-organizational policy based on client satisfaction relies upon a workforce that will be sensitive and responsible towards the total quality of products (case in point at Sudcases where workers sign the manufactured article). Other examples include, respecting delivery deadlines and the procedures which are intrinsic to just-in-time production, understanding the need to rearrange production lines and adjusting or reprogramming machinery in order to meet changes in requirements and the development of products (goods or services). In concrete terms this means that the operators are trained and made responsible by fetching their own components or materials, organizing their tasks, regulating the machinery, being responsible for the equipment, maintaining the mechanical production line, cleaning their work area, checking quality "on line", locating breakdowns and providing an initial diagnosis and even suggesting improvements.

Thus, responsibility extends beyond the production process per se and incorporates other dimensions. In this respect workers are required, either individually or collectively, to take a responsible attitude towards their training. Being responsible for one's training involves pinpointing the gaps and finding the necessary information in technical handouts, books or journals, in the resources department or by approaching colleagues prepared to provide the information and sacrifice the time needed to transfer the knowledge. This situation is particularly evident at Lighting but also at HCM (a commercial company not presented in this final report). In this connection, we should highlight the importance of informal exchanges over and above formal communication.

Operators must also be sensitive to the reliability of data which is mechanically transferred and subjective information which has to be provided or transmitted less formally when faced, as a team or together with other units, with problems during production and breakdowns in the mechanical system. The operator's responsibility, rather than confined to a definitive work position and a fixed division of tasks distributed among individuals, becomes a "team" responsibility within a comprehensive system of elements and units which he must understand and recognize in terms of their interdependencies and inter-relationships.

3. THE IMPORTANCE OF TACIT KNOWLEDGE AND HIDDEN KNOW-HOW

Given this new development in industry, we must recognize the vast numbers of ways in which competences arise and develop and can then be invested in daily work. The experience gained on the job appears all the greater because we are largely studying workers. Seen in this new light, the company is playing an increasingly important role in the training of these workers.

Undoubtedly, the company can, through its directors and employment policy, achieve particular results in terms of skills and competences. These may range from individual to collective training sessions, investing effort and resources into training courses held either in-house or externally and by organizing various training courses relevant to promotion paths.

However, the company is also responsible for indirect training which we have called "implicit" or "discreet". The working day and the working experience contribute to the skilling process, particularly as a consequence of the difficulties, breakdowns and problems with which the worker is faced. The company also acts as a potential trainer through the variety of tasks it gives the worker, through job rotation which it organizes and through the technology it chooses and the materials and products it selects, in fact through all the concrete conditions in which work takes place. The company is also instrumental in providing training during the spontaneous exchanges between workers at change-over times in the programme, and when it encourages exchange of knowledge and expertise between individuals and departments through quality circles, study groups and progress groups. All these situations offer many opportunities for collective learning, for building common knowledge and for making use of the creative potential of individuals and groups.

Moreover, when employing a worker, the managers have always taken an interest in his formal education, but now they are also becoming increasingly curious as regards the informal acquisition of his competences. Importance is attached to knowledge and experience gained outside work, not only in continuing training courses or through the media, but also in free time and pleasure activities, and hobbies, which access a whole range of relatively sophisticated equipment and apparatus. Finally, as we have seen, company managers are systematically trying to transfer the skills developed outside the workplace into the working environment. At worker level the skills which are employed in everyday life e.g. filling out a giro slip, managing the housekeeping money, mending a lawnmower, using a banker's card, etc. are likened to certain occupational skills such as filling in the quality control slip, replenishing supplies of components, regulating the machine, coding a batch of rejects. Skills are judged by their potential application in the workplace. When recruiting, employers are paying more attention to how people behave outside work since this is considered to indicate how they will respond to their job.

4. THE INTERFACE BETWEEN SCHOOLING, APPRENTICESHIP AND IN-COMPANY TRAINING

This presentation of tacit knowledge and hidden learning methods shows that vocational education and apprenticeships, which appear to be the most institutionalized areas of education, far from represent the whole of the skilling and training process. The object of this report is obviously not to deny the importance or value of formal sources of knowledge and competences or the agencies connected with initial or continuing vocational training either within or outside the company, but rather to show the need for the integration of formal and discreet training. Such an integration is all the more necessary since the skills of the worker and the competences of the operator are increasingly dependent on the complex development of knowledge and expertise during the course of a working day and a working life. Knowledge and competences are acquired and are put to use throughout a number of working situations, through the individual's ability and willingness to teach himself, through daily exchanges and transfer of knowledge between individuals, groups and categories of workers and between different areas and sections of the company.

Establishing links between the various ways of acquiring information, knowledge and competences presupposes that it is possible to take into account all the many techniques which companies have developed and, above all, to understand the training impact of work and also, for example, the introduction into the workshop of educational tools such as a syllabus and charts.

The distinction made by educationalists between formal and informal training is perhaps relevant when analyzing the practices connected with Taylorism and Fordism. In this case the company trains its workers to adapt quickly to a work position or a task without making training a strategic aspect of industrial management. At the most, some technical training is given in a formal situation (formal training) but without any great regard for what happens in practice in the workshop (informal training); at any rate, work is simplified as much as possible and is seen in terms of method.

The situation resulting from the new ways of organizing work and production has made it far more difficult to pinpoint what is formal and what is informal. It is therefore current to talk about the permeability of the two styles. At a semantic level, can we still use the word informal when describing training on the job, for example, standing in for the person training, when it has been specifically organized by the management of the company? Apart from an abstract level, there is undoubtedly no clear line between formal and informal training. In reality they are two sides of the same coin.

A whole range of explicit training techniques are brought into play in order to get the worker started and adapted to new forms of work organization or to help him understand external constraints. These include both monitoring, rotation and standing in which take place in the workshop, and also training in specific areas, for example, training known as "project", "product", "technical" or "quality" at Lighting , and GMP, Safety and fork lift truck training at SB.

To this explicit training we must add training processes which are very much more "discreet" and which arise during vertical and horizontal exchanges, in problem solving activities, and in the organization of a working day. From our research it is evident that explicit training techniques do not account for all the competences that are continually accumulated, unless it is in terms of the limits set to their content and their application. There are now other forms of training connected to work situations which have the characteristics of training and which are creeping into the interval times between programmed work periods. This is what we mean when we talk about discrete training processes.

5. THE NEED FOR NEW METHODS OF ANALYSIS

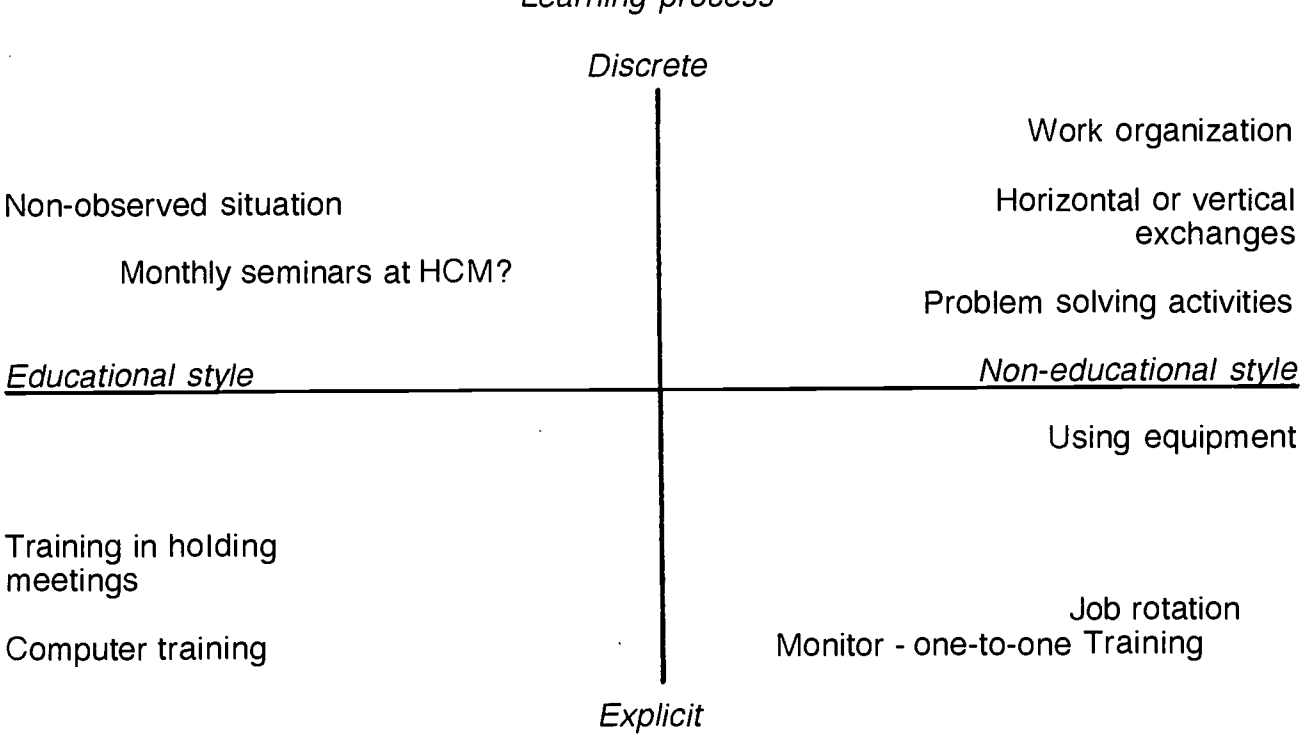
Faced with a situation which is becoming increasingly complex and varied as regards training within the company, the sociologist should perhaps consider new ways of tackling the subject. One of these methods (the relevance of which of course remains debatable) is to examine on the one hand the ways of providing training and on the other, the learning process itself.

Transmission has certain characteristics and is subject to particular limits within which knowledge is channelled in different ways. However, if the form of transmission is unsuitable for the subject, it will experience "training" modes which are possible and these will thus become part of the learning process. In traditional forms of transmission we can distinguish between educational and non-educational types. With reference to the definition given by Ph. Perrenoud (1990) the educational form (at its highest level) has certain characteristics: a didactic contract between the trainer and the trainee, a distinct social

application which is different from other social applications, description and planning, didactic transposition, learning time, intellectual and physical discipline, criteria of evaluation, work (unspontaneous learning), social implication, relative autonomy in relation to other forms of social contact.

As for the learning process, any analysis should take into account the levels of visibility and purpose present. This leads us to recognize discrete training processes as vision -, purpose -, and explicit processes as vision +, purpose +[30].

It is possible to demonstrate this by drawing a graph showing the process of transmission on one axis and the process of learning on the other. By way of example, it is possible to show the proximity or distance between effective training methods.



Discrete training is obviously difficult to detect because it lacks visibility. This is often compounded by the fact that discrete training can be secret and jealously guarded. Thus various related questions arise. Is the knowledge acquired through discrete training also discrete or is it apparent? How aware is the worker of the fact that he is receiving training? To what extent are the managers of the company aware of the effects of discrete training? Should there, from now on, be a distinction between discrete training which is explicit for the worker and implicit for the company, and discrete training which is implicit for the worker and explicit for the management?

Moreover, the "discrete" aspect of the learning process masks another consideration, namely, with reference to the mathematical meaning of the word "discrete", the discon-

30 If we take a theoretical approach and draw a parallel between the processes of learning and exploration, we will see that there is an element of unexpectedness for the person involved - things happen unintentionally, if only to a very slight extent. The worker will very likely fail to recognize or internalize what he experiences at work in terms of training despite the fact that has benefited from it. Thus, we are less concerned here with the "osmotic" training process, that is to say those forces with training impact which unobtrusively permeate our being thereby giving us a new way of seeing, feeling and behaving (cf. for example, the multiplicity of stimuli at the workplace which leads to a form of intellectuality such as high-lighted in the case of Lighting).

tinuous and irregular character of training. Although this observation is secondary, it raises a basic question which is ultimately at the root of the whole discussion: when dealing with concrete work situations, at what point does new knowledge emerge?

6. COMPREHENSIVE APPROACH TO THE PROCESS OF GENERATING COMPETENCES: WHERE DOES NEW KNOWLEDGE BEGIN?

Let us start with the concept of experience and set up one or two markers. Each experience is personal. To experience something, is "to feel, to sense oneself, to sense what is in oneself and around oneself" (R. Williame, 1978, p. 9). To experience something..., e.g. a particular aspect of work, suggests a second dimension which consists of having experience of something... .
When at his work position, the worker will, at the very least, acquire:

- physical skills, that is, body movements which are suitably coordinated with the demands of the technical equipment;

- technical know-how which enables him to experience and assimilate the capacity of the technical equipment he is using, along with his own capacity in relation to the equipment.

In the work he is doing there is undoubtedly an experience that is taking shape. Can we, however, talk about skilling work? In other words, at what point and on what basis can we say that work organization has a training impact?

Looking at the question from a time point of view, we can distinguish two definite stages in the work process:

- *programming*: the work determined by a formalized system;
- *experimentation*: the individual confronted with the work. Seen over a period of time, experimentation is prone to becoming *routine*.

Moving on from this idea, we can identify three "moments" which intermingle in the act of production.

- The **programming moment**: that is the assignment of a work position and a function, the standards which predetermine the movements and the working time, the smooth running of the machine, etc.;

- The **operating moment**: that is bringing into play, *without surprise*, the worker's body movements and his store of knowledge and skills which may be a direct result of practice[31]. This is also the moment when the worker shows himself willing or not. In short, this is the moment of *personal adjustment to work*;

- the **exploratory moment**: that is the search for solutions demanded by the emergence of an unexpected problem (material or conceptual) or by the introduction of a new fact. This results in the *"relaunching" of a whole process of experimentation*, without it automatically becoming part of a system of knowledge accumulation or

31 In particular, this store covers all the "tricks" which are thought up and transmitted (often carefully) to compensate for organizational shortcomings. This moment includes a whole process of experimentation, which eventually stabilizes.

even a configuration of complementary elements; on the contrary, it can lead to dispersal and undoing of knowledge. The exploratory moment requires the operator to think up a way of overcoming the problem (whether it is real or not - the exploratory moment may take place before, at the same time, or after the event) and adjusting to the new situation.

In summary, the worker has his own style of approach which is made up of constraints and freedoms. He tries to correct a difficulty or to respond to a new situation. He explores, takes risks, experiments and thereby discovers new knowledge and reactions. Problems and questions with which he is faced at work may also be taken out of the work situation and dealt with in a different environment, for instance, during his free time. Thus the individual does not necessarily acquire all his new knowledge at work although the content of his work is the driving force. In addition, it is in the course of various social contacts that the individual develops skills which are of potential value at work.

In the face of this complex socio-technical situation, acquiring knowledge depends on the smooth functioning of a production unit capable of responding not only to the *indeterminable* situations which arise, but also to a programme for the self-development of the worker. Nevertheless, the whole idea of learning presupposes the existence of a range of possibilities and also that the worker or group of workers is aware of this fact. This range of possibilities requires sufficiently autonomous areas for the subject to be actively investigated: time and space (whether organized or not) dedicated to thinking, finding solutions and putting them into action. One of the principle aspects of this action seeks to expose the margins of manoeuvre available to the workers in a company. The more a company encourages learning, the more it will be in a position to train its workers: the greater the freedom given to the operators in flexible situations, the more the company will be able to offer the possibility of acquiring new knowledge.

Thus, it is a question of appropriate organization which allows the operators, among others, to evaluate the success of their effort and the quality of their work, and, as a result, develop new areas of independence. Naturally, in order for it to work, this organization must be linked to active individual and/or group participation and a minimum involvement in the activity.

Certain positive attitudes encouraging discrete learning processes came to light during our investigation. This was the case at Lighting where the operators talked about the concept of development and at SB where the warehousemen had a pride in their job and also at HCM (a company which has not been included in this report) where the representatives were motivated by financial incentives. Encouraged in this way, workers are likely to invest in new knowledge and also in an informal development of their competences. But are these sources of motivation sufficient? Once again we are faced with the question: what is the workers' attitude to training and the new organizational structures? If nothing else, it is time to raise the question: do the workers recognize the way production and work is organized?

A heuristic hypothesis also emerges. As C. Maroy emphasises, separating workers according to the tools of their trade and how they use them has for a long time produced a set of common objectives which has been the touchstone of "worker know-how" and of a whole system of norms which are shared daily and which accumulate on the fringe of the technical organization of production. These norms are based on worker solidarity and show a working class pride. Tant Linhart (on negotiated involvement, 1991) or Reynaud (on independent fixing of salaries, 1989) or Fischer (on hidden self-management) draw attention to the need for interplay between the norms of management and self-protection and self-estimation among the workers using a framework of structured communication.

Currently, the post-Taylor methods of organizing production, such as involving staff in management and in the improvement of the production process, encouraging self-training, appreciation of the worker's knowledge, motivation towards taking initiative or responsibility, are all part of a management programme which is based on gradually reducing the salary and class differential. At the very least it presupposes the weakening of a culture which is largely founded on challenging (either implicitly or explicitly) the way the management organizes the company. But in legitimizing what was secret and making visible what was invisible (that is the worker's creativity, the movements and knowledge which are developed as a result of doing a job, etc.) do we not risk strangling the very source of "discrete energy"?

7. COMMENTS ON THE RECOGNITION OF SKILLS ACQUIRED AT WORK

While the company is undeniably a major factor in the training process, and continuing vocational training is an integral part of work experience, the socialization of production, to use Baethge's expression (1986, pp. 479 to 493) becomes an issue for the trade unions from the point of view of solidarity and equal opportunities. In fact, the socialization of production, seen from the point of view of the training impact of work and discrete learning processes, results in discriminating against individuals either directly or indirectly and emphasising their differences.

Since explicit training can, for example, be monitored at its access point, the social partners can take part in pilot schemes. As things stand, however, discrete training is completely unmanageable and arbitrary[32]. Thus, the importance of discrete training in the training process should be clarified because it is relevant in terms of certification, classification, social and monetary recognition and treating workers equally.

The exchange and the acquisition of knowledge which accompany changing jobs also presents the problem of the length of the contract of employment and in overall terms the problem of producing a sufficiently stable workforce. Some economists, such as R. Boyer (1991), believe that this double exchange of knowledge and work should lead to perpetuating a work relationship and to the development of a life-long job. The developments taking place at technical and economic levels, and in the way knowledge and expertise is acquired and transmitted inevitably have an effect on the way the employment market is managed, on the rules which control it and on the competition and the negotiations which are taking place. No doubt we shall be looking at problems connected with finding the time for training, deciding how to give recognition to versatility and adaptability, how to remunerate the different types of knowledge acquired in a job, and according to which criteria to award certification. All these things will assist the transfer of knowledge and its reinvestment in other jobs either in the same company or elsewhere.

In this connection certain experts state that qualities such as adaptability and creativity which are developed as a basis for carrying out specific tasks are fundamentally transferable, often to better effect than formal qualifications. The computer market is probably the best example of an area where skills can be transferred laterally, even if their application in different companies appears to be diverse. The more specific the know-how required in a company, the less likely that it will be easily transferable. An indication of

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32 The use of the term "arbitrary" emphasises structures which create unequal opportunities for access to discrete training. However, these structures are not formally planned (hence the word arbitrary). For example, in the study of Lighting we see that the operators who are required to work at the conveyor belt find it more difficult to organize their time so that they can learn how to use the computer than the operators working on islands which are free from the constraints of eyor belt. Thus, the latter appear to be more developed, particularly in the eyes of the management. This could have an effect on promotion or even on keeping their job in the company in the event of redundancies.

non-transferability may be found in the evolution of internal labour markets and simultaneously in the involution of external markets.

The fact remains that, in relation to the problem of recognizing competences and knowledge (which is only partly solved by length of service), workers and their representatives may wish to receive certification in respect of training received in the course of their work and as a result of the way it is organized, be it discrete or part of the training offered by the company. Formalizing learning acquired through work, on a joint basis, would give the worker recognition not only within the company but also in society in general. It would increase the possibility of transferring his competences and thus improving his chances of promotion either internally or externally. It would give more weight to the qualification in real terms, and would help to classify the worker more clearly within the structure of qualifications and scales of remuneration. However, as G. Dupont and F. Reis (1991) emphasise, this kind of certification remains the exception, undoubtedly because not everyone has the same interest in giving formal recognition. Very often the employer does not wish to recognize the level or the nature of the "qualification" directly, because this risks opening the door to salary claims or to favouring the employment by competitors of workers whom he has taken the time and money to train. However, this tendency not to recognise qualification is decreasing for related reasons, among other things, the generalisation of training and the management's desire to promote the company's high standards and reliability by demonstrating the various kinds of training undertaken by the staff together with their "high" level of competences.

BIBLIOGRAPHY

AOKI M., 1990,
"Towards an Economic Model of the Japanese Firm", The Journal of Economic Literature, Volume XXVIII No.1.

BOYER R., 1991,
"The Economics of Job Protection and Emerging Capital Labour Relations from the Perspective of "Regulation Theory", Cahiers CEPREMAP, Paris.

BOUSQUET N., and GRANDGERARD C., 1988,
"Evaluation prospective d'une prospective d'une politique sociale spécifique: des entreprises font de la formation de l'ensemble de leur personnel le moteur de leur modernisation", *INRP, Dpt d'études sur les enseignements technologiques,* Paris.

BOUSQUET N., and GRANDGERARD C., 1990,
"Les ambiguités de l'innovation", in *Education Permanente,* No. 104.

CORIAT B., 1991,
Penser à l'envers, Christian Boureois Editeur.

COING H., 1976,
"Rénovation urbaine et changement social", Paris, Editions ouvrières.

CROZIER M. and FRIEDBERG E., 1977,
"L'Acteur et le Système", Editions du Seuil.

DAYAN J.L., GEHIN J.P., VERDIER E., 1986,
"La formation continue dans l'industrie", *Formation, Emploi*, No. 16.

DEBATY P., 1992,
"Formation formelle et formation informelle dans trois entreprises néerlandophones en Belgique", CEDEFOP, FOREM, Berlin/Brussels.

DE BRIER C., 1990,
Les pratiques de formation des entreprises belges, Louvain-la-Neuve, UCL, Institute of Work.

DELCOURT J. and FUSULIER., 1992,
Place de l'entreprise dans le processus d'acquisition de la qualification, étude de cas pour la Belgique, CEDEFOP, UCL Institute of Work, Berlin/ Louvain-la-Neuve.

DUPONT G., REIS F., 1991,
"Enquête sur la formation continue dans les grandes entreprises". CEDEFOP, Berlin.

Les Editions du Centre Psychologie Appliquée, 1991, "Questionnaire des Valeurs Professionnelles de Donald E. SUPER", Paris.

EXIGA A., PIOTET F., SAINSAULIEU R., 1981,
L'analyse sociologique des conditions de travail, Collection Outils et Méthodes,Agence Nationale pour l'Amélioration des Conditions de Travail, Paris.

FISCHER G-N., 1986,
Espace industriel et liberté, Presses Universitaires de France, Paris.

FUSULIER B. et alii, under the specialist direction of MAROY C., 1993,
"Changements socio-organisationnels et les stratégies de formation des entreprises", 3 volumes, Services de programmation de la politique scientifique, UCL-Institute of Work, Louvain-la-Neuve.

GOFFMANN E., 1973,
La mise en scène de la vie quotidienne, Editions de Minuit, Paris 1973.

LACROSSE J. M., MAROY M., MOLITOR M., 1990,
"Modernisation technologique et formation continuée", UCL, Department of Sociology, report for the Ministry of Education and the French Community.

LAUTIER F.,
Les lieux de travail. Un espace inimaginable? in *La théorie de l'espace humain,* CRAAL-FNRS-UNESCO, Geneva.

LEHNER F., 1991,
"Anthropocentric production systems: the European response to advanced manufacturing and globalization", synthesis report for the commission of theEuropean Communities, Institute of work and society,North-Rhine Westphalia.

LINHART D., 1991,
Le torticolis de l'autruche. L'éternelle modernisation des entreprises françaises, Seuil, Paris.

MAROY Ch., 1991,
"Rapport intermédiaire sur les changements socio-organisationnels et les stratégies de formation des entreprises", S.P.P.S.I.S.T., Louvain-la neuve.

MERCHIERS J., 1990,
"L'organisation du travail et la formation dans la métallurgie: les recherches des dix dernières années", *Formation Emploi*, No. 31. pp17-32.

MINTZBERG H.,
Structure et dynamique des organisations, trad. 1982, Ed. d'organisation et Agences d'Arc, Paris and Montreal.

NYHAN B., 1991,
Promouvoir l'aptitude à l'autoformation, - Perspectives européennes sur la formation et le changement technologique, Presses interuniversitaires européennes, Brussels.

PAUL-LÉVY F., 1984,
La ville en croix, Librairie des Méridiens.

PAUL-LÉVY F. et SEGAUD M., 1983,
Anthropologie de l'espace, CCI, Paris.

PEDLA M., 1991,
Le besoin d'organisation auto-apprenante comme élément essentiel d'une strategie globale de gestion, in B. Nyhan, op.cit. pp.132-145.

PERRENOUD P., 1990,
"Quelques traits distinctifs de la forme scolaire", working report, 10p.

REMY J., VOYÉ L., SERVAIS E., 1978,
Produire ou reproduire, Volume I, Editions Vie Ouvrière, Brussels.

REMY J., 1986,
La limite et l'interstice: la structuration spatiale comme ressource sociale, in *La théorie des espaces humains*, CRAAL-FNSRS, Geneva.

SIMMEL G. 1984,
"Méropoles et mentalités" in l'Ecole de Chicago - Naissance de l'écologie urbaine, Y. Grafmeyer et I. Joseph, Aubier, Paris, pp. 61-77.

VANDEWATTYNE J. and VAN ASSCHE E., 1990,
"L'effort de formation des entreprises en Belgique", Fondation Industrie Universtité, Brussels.

WILLIAME R., 1977,
Phénoménologie de l'intervention, Presses Universitaires de Louvain, Louvain-la-Neuve.

ZARIFIAN Ph., 1993
Quels *modèles d'organisation pour l'industrie européenne? - L'émergence de la firme coopératrice*, Logiques économiques L'Harmattan, Paris, 286 p.

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The role of the company in generating skills
The learning effects of work organisation
Belgium

Jacques Delcourt, Bernard Fusulier
Department of Sociology/Institute of Work — Catholic University of Louvain

Pol Debaty
FOREM

in collaboration with
Christian Maroy
Department of Sociology/Institute of Work — Catholic University of Louvain

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European Centre for the Development of Vocational Training
Marinou Antipa 12, **GR-57001 Thessaloniki**
Tel. (30-31) 49 01 11; fax (30-31) 49 01 02
E-mail: info@cedefop.gr
Internet: http://www.cedefop.gr

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