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INTRODUCTION TO THE WORKSHOP - OCCUPATIONAL HEALTH POLICIES IN THE EUROPEAN UNION

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The industrial revolution brought new hazards to the health of the workers. In a paper delivered to the British Royal Society in 1662 a Mr. Power reported that only after a miner was lowered into the pit and became asphyxiated was it found necessary to lower dogs, or more frequently candles, into pits to establish whether they were fit to enter. (Nef, 1932[i]). This situation has dramatically changed. The trade union movement, the enactment of legislation protecting the health of workers, the creation of inspectorates to enforce this legislation, and the action of health and safety professionals have contributed to the improvement of workers' health in all European countries.

At present, the occupational health policies which stem from the industrial era are gripped by a deep crisis. Constant technological change, the changing patterns of employment and production, the limitations of inspection services, cost cutting exercises in many companies and the weakness of the trade union movement have all rendered most of the current occupational health policies obsolete. Policies that were suited to an industrial society need to be adapted to a post-industrial situation. Many European countries are in the process of reforming their occupational health policies to confront these new challenges and also as a result of the implementation of the EC Framework Directive on the introduction of measures to encourage improvements in the safety and health of workers (Directive 89/391/EEC[ii]).

The European Foundation has produced research on occupational health policies in 13 member states of the European Union. The results illustrate the diversity, complexity and changing trends which exist in this field and identify common challenges for the future (Piotet, 1996[iii]; Walters, 1996[iv]).

A complex picture with many components

Occupational health systems in Europe vary from country to country but they all involve the interaction of many different components. These components are legislation, inspection, insurance, occupational health services, information, research and training.

Legislation has traditionally been of a normative and technically detailed nature. The Framework Directive has brought a new approach. It defines general principles and includes topics such as information, consultation, participation and training. The general principles of prevention referred to in the Directive include combating risks at source, adapting work to the individual and developing a coherent accident and disease prevention policy. The obligations of employers and workers are spelled out as well. Employers are responsible for risk assessment and the provision of protective measures. Workers should, as far as possible, take care of their own safety and health and that of other persons affected by their actions.

Inspection is underfunded and overstretched in most Member States. Health and safety inspectors are key actors in achieving improvements in health and safety at work, but they have to contend with limited human and budgetary resources. The role of the inspectors has evolved from enforcement of legislation to a mixture of advisory, educational and compliance work. In many countries, such as the UK, Italy and Denmark, they are health and safety specialists.

Insurance bodies, either public or private compensate for occupational accidents and diseases. Insurance bodies are affected by a general financial crisis regarding health and safety liabilities to which they are trying to respond in different ways. For instance, premiums have been linked to company health results or prevention efforts in some Member States. This opens the door to using economic incentives as tools for accident and disease prevention (Bailey, 1994[v]). As well as compensation and prevention, many insurance bodies undertake treatment and rehabilitation.

Occupational health services undertake different activities such as expert advice, prevention, first aid, treatment, education and training according to the country concerned. It seems that services are driven by two main philosophies: in some Member States "the company is the patient", and in others the approach is more focused on the individual worker. The former deals with the assessment and adaptation of the working environment to human requirements. The latter gives priority to the individual worker's health. The professionals staffing the services are mostly medical doctors in Southern Europe and France whereas the Nordic countries and the Netherlands have set up multidisciplinary services. The services are usually financed and organised by the company or a group of companies but are subsidised by public monies in Italy and Finland.

Advice and Information is mainly supplied by public agencies, trade unions, employers' organisations, trade associations, standards institutes, professional bodies and professional journals. The amount and quality of information available is linked to the development of health and safety infrastructures in each country. Research also varies throughout Europe with national institutions for health and safety in some countries, and universities, industry and consultancy organisations all contributing to the overall output. Training is considered to be insufficient and more effort must be devoted to health and safety education in schools and management training in health and safety.

The components of the health and safety system - legislation, inspection, insurance, preventive services, information, research and training - interact in a very close manner. The crisis of health and safety policies affects the whole system and there are common challenges that Member States must confront to reorganise the system.

Common challenges and diverse solutions

Health and safety at work should be regarded as an investment and not only as a cost. Research has demonstrated the impact of occupational health on company productivity, quality, employees' morale and corporate image. The challenge is how to bring a cultural change to European companies that will enable them to consider occupational health as a company investment.

Occupational health has to become a *company* function, in contrast to the traditional method of giving the responsibility to specific company departments such as occupational medicine, safety or personnel. Accident and disease prevention as a company function means that the potential health impact of all company policies and decisions should be taken into account systematically.

Insurance bodies can promote accident and disease prevention through mechanisms such as economic incentives, information, expert advise, and training. Companies investing in prevention would benefit from lower premiums.

Public policies need to support a cultural change in company health through inspection, training, information, research and incentives. This should facilitate and enforce the internal control of company health, include occupational health in the school curriculum, provide support for continuous training, foster the dissemination of models of good practice, promote research in the technical, managerial, social and economic dimensions of prevention, and provide incentives for company investments in prevention measures.

Workers' participation is an asset for company health. Direct or representative participation of workers can make information, ideas and resources available to the technical experts. In addition, genuine participation is a guarantee of the employees' commitment to company health policies and it empowers workers in relation to their health.

Vulnerable sectors should be made a priority. Migrant, illegal, fixed-term contract, part time and SME (Small and Medium-Sized Enterprise) workers have special needs and require specific strategies.

The transition from an occupational health system devised for an industrial society, towards a new system able to answer the challenges of a post-industrial economy, will need the courage and imagination of European policy-makers, trade unions, employers and researchers. A debate on these challenges should be held at European level where all actors could put forward their contributions.

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HEALTH AND SAFETY POLICIES IN EUROPE: AN OVERVIEW

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The aim of the study was to produce an overview and assessment of the policies and strategies for improving health and safety in the thirteen countries. The enormity and complexity of this task coupled with the very limited time and resources at our disposal means that the national reports and certainly the two published European reports barely scratch the surface of the subject. They also do not provide any startling new discoveries or indeed contain any suprises for anyone involved in health and safety in Europe. If there is any value in the general findings I think it probably lies in the presentation of a typology of national systems which allows some international identification of common themes and issues during the 1990s and which might provide a factual baseline for further discussion concerning future developments.

This presentation will focus on 3 areas and then draw some general conclusions.

Health and safety outputs
- *Occupational accidents and disease*
- *The economic costs of accidents and ill health*

The economic context
- *Employment and the labour market*
- *Industrial relations*

Health and safety policies and structures
- *Legislative Framework*
- *Labour inspection*
- *Insurance systems*
- *Preventive services*
- *Employee representation*

Conclusions

Health and safety outputs

Occupational accidents and disease

Data on occupational accidents show some already well established features, such as the hazardous nature of industries like construction and engineering. Because of national variations in reporting requirements and the uncertain reliability of much of the data on occupational accidents and ill-health, the data collected in the study was unable to add much to the picture already established by previous studies of trends in accidents and disease in Europe [(4),(5)]. It was widely held that whatever the limits of reporting systems, the extent of occupational injuries and 11 health still represents an unacceptably high burden on society in terms of death, disease and human suffering that is largely preventable.

Several countries have experienced improved figures for occupational injuries during the period under review indicating a continuation of trends identified in the OECD study [4]. Fatal accident rates have continued to fall in most countries. Reasons for the decline are attributed to changes in patterns of employment, with movement away from the more hazardous industries. (For example, in the United Kingdom in its 1994/95 Annual- Report, the HSC estimates that about half the fall in the fatal injury rate can be attributed to shifting patterns of employment and in its previous reports suggested that the percentage thus attributed might be greater). Piotet points out in her analysis of the data from the present study, that although recent figures indicate a significant reduction in industrial injuries (with the exception of Italy), this reduction is closely tied to economic trends..... and is contemporaneous with a growth in unemployment." [3]. Data for lost time injuries and serious injuries is much more difficult to interpret and overall trends here are less evident although they can be related to changes in employment patterns and economic growth and decline.

Data on occupational diseases in the national reports afforded little opportunity for comparison because of differences in the definitions of the information collected. These problems are well documented elsewhere [4],[5],[7].

Problems with the reliability of data on injuries and ill-health were reported in many countries. Under-reporting is the most commonly identified failing in the data, although there is uncertainty and variation in the degree of under-reporting in different countries and between different industrial sectors. This is not surprising since the methods for collection of data range from those where employers are obliged to provide information through to those based on claims for benefits resulting from injury and disease and consequently include different incentives for reporting. The increasing recognition of the limits of much of the legally required reporting of occupational ill-health is concurrent with a growing awareness of the broadening of the definition of work-related ill-health amongst the social partners and specialists. Concern in this respect also relates to the limited ability of existing systems to reflect accurately the extent of such issues as stress and the impact of psycho-social variables upon health at work.

The economic costs of accidents and ill health

The cost effectiveness of preventive measures and cost benefit analysis in health and safety in general are features that are evident in the analysis of specialists, regulatory agencies and employers in some of the northern European countries, although the economic aspect of health and safety performance seems less prominent overall than might have been anticipated. There is certainly a need for more empirical research in this field. Economic data generated in several countries indicates the very high cost to the economy resulting from accidents and ill-health arising during the course of employment. For example in the United Kingdom the HSE has estimated that the overall cost to British employers of work-related ill-health and accidents is between £4.5 billion and £9.5 billion a year. This is equivalent to between 5% and 10% of all UK industrial companies gross trading profits for 1990, or between £170 and £360 for each person employed. The cost to the economy as a whole is put at between £11 billion and £l6 billion, or 2% to 3% of Gross Domestic Product [8]. In Italy detailed research into industrial injury estimated that in 1991 it cost 3.05% of the GNP [9]. In Finland the figures fall in a range of between 5 to 15% of the GNP [10], while in Germany industrial injuries resulted in a cost of 18 billion ECU to society [11].

The economic context

Employment and the labour market

There is considerable diversity in the economic context of the countries studied.

Table 1 Working populations percentage distribution by sector

Country		Agriculture	Industry	Services
Germany	(90)	3.6	40.5	55.8
Belgium	(91)	0.7	30.8	68.5
Denmark	(93)	5.0	26.8	68.5
Spain		7.8	38.4	53.8
Finland		9.0	27.0	64.0
France		6.1	29.6	64.6
United Kingdom	(94)	1.2	25.5	73.3
Greece	(91)	22.2	27.2	50.2
Italy	(93)	7.6	33.0	59.4
Ireland	(92)	13.4	28.0	58.6
Netherlands	(93)	4.0	25.0	69.0
Portugal	(93)	11.3	32.9	55.8
Sweden	(92)	3.0	26.0	70.0

The figures in brackets represent the year of reference for the statistics of the working population

Source: Piotet, 1996

Table 1 (above) shows the extent to which the service sector dominates the employment profiles, with over 50% of the working population found in this sector in all countries, and considerably more than this in some countries such as the Netherlands, Belgium, Denmark, Britain and Sweden.

Agriculture still accounts for a significant percentage of the working population in southern European countries such as Spain, Greece, Portugal and Italy as well as in Ireland and Finland. In the larger industrial countries of northern Europe, the working population employed in the secondary (industrial) sector is declining, although it remains exceptionally high in Germany.

There are broad similarities in the economic context in which the recent development of health and safety strategies has taken place, with the recession of the early 1990s exerting a powerful effect on the economy in all the countries studied. Increased unemployment, concerns over job

security, precarious employment, part-time and temporary work, the move from larger to smaller business units and changes in management style are factors that feature in all European countries. The increased role of women in the labour market and an ageing workforce are also common features. All of these developments are relevant to the assessment of health and safety strategies:

Unemployment increased in all countries during the study period. Some countries have been affected more severely than others. Thus, there have been enormous increases from the relatively low levels of unemployment at the start of the period in the Scandinavian countries, while in other countries such as Spain levels of unemployment have remained very high throughout the period in question.

The health effects of long term unemployment have been studied and are known to be significant [13]. Such effects also raise a question about whether unemployment and concern over employment security, as well as increases in precarious and illegal employment, also affect attitudes toward health and safety. There is no conclusive evidence from the national studies that this is the case, but this may be because research in European countries has not focused on this issue.

There is a common trend towards an ageing workforce which is observed throughout Europe and which will continue given present birthrates and the widespread tendency for young people to remain in education for longer. This should have implications for health and safety strategies throughout Europe, although the national studies were only able to demonstrate limited signs of it being addressed in most European countries. In the Netherlands [14], Germany and in Scandinavian countries [15],[16] there was concern with the need for research on this issue and the provision of support facilities relevant to the needs of the ageing workforce.

The role of women in employment has also increased markedly in most European countries. The data from the national reports indicates a participation rate of around 40% in the industrialised countries in Europe. Recent research and writing on women and work indicates that women face a different set of challenges to their health and safety than those faced by men, particularly those that reflect the interpenetration of paid work and domestic responsibilities [17],[18],[19],[20]. In most countries in Europe the traditional approaches to protective health and safety regulation ignore these differences. Although recent changes in legislation prompted by the Framework Directive 391/89 may have changed the traditional focus of statutory regulation, a gender perspective on working conditions is not evident in the health and safety strategies of most countries.

Employment in small enterprises is a significant feature in the economies of all European countries. More than half the workforce are employed in enterprises with less than one hundred employees in some countries and in others there are more than three quarters employed in such enterprises. **Table 2** below is based on data from the national studies. It is not a comprehensive picture because of differences in the availability and classification of data in different countries.

Table 2 Employment and workplace size in selected European countries

Country	SMEs % of enterprise	SMEs % of workforce	Definition of SME
Belgium	97.0	40	< 50 employees
Finland	99.0	45	< 100 employees
France	97.0	53	< 50 employees
Greece	99.5	74	< 50 employees
Ireland	97.0	50	< 50 employees (in private sector)
Netherlands	98.0	?	< 100 employees
Portugal	98.0	51	< 100 employees
Spain	92.0	80	Not known
Sweden	97.5	30	< 50 employees
United Kingdom	96.0	50	< 100 employees

Despite the present importance of small and medium sized enterprises (SMEs) and the suggestion in many countries that their share of the economy is growing, many national health and safety structures and strategies are best developed in relation to large enterprises and they often have limited application to smaller enterprises. There are few widespread initiatives that seem to have specifically and successfully tackled the question of health and safety in a sustainable way in smaller enterprises. It is also the case that the institutions of employee representation and the legislation that governs collective representation of employees are best developed and focused upon large enterprises, with only limited application and in some cases exclusion from smaller workplaces. Evidence from British manufacturing shows that workplace size is a significant influence on trends in occupational injuries with SMEs accounting for proportionally higher rates for major injuries than larger enterprises[21],[22],[23].

There is a significant proportion of immigrants amongst the workforce in many European countries. In these countries the composition of foreign workers in the labour force varies between 5% to 7%. It is of concern that immigrant workers appear to suffer greater numbers of occupational accidents. This is usually attributed to their employment in industrial sectors with high accident rates, such as the construction industry. As the research on the different effects of work-related health risks on immigrant workers indicates, these differences are the result of very complex combinations of discrimination and disadvantage[26], [27],[28].

The national reports show an increase in part-time work in northern European countries and there is an association between such work and the hidden, unregulated economy. Precise data on the illegal economies of most countries is difficult to come by and there are varied estimates in the national reports. For example in Belgium and the Netherlands it is estimated to account

for 15% of the GNP, while in Germany only 1% of the GNP is estimated to result from illegal work. Although there is an absence of accurate data, it is usually believed to play a more significant role in the economies of southern European countries than those of northern Europe. Whatever the extent of the illegal economy, there was widespread agreement that instruments and strategies of occupational health and safety regulation had little effect on health and safety outcomes in this sector.

Industrial relations

There have been considerable changes in the profiles of industrial relations in the countries studied. In particular, the decline in membership of trade unions has continued across Europe (with the possible exception of some of the Nordic countries). Reasons for the crisis in representation have been variously defined. They include unemployment and trends which have reduced employment in industrial sectors and firms with high trade union density, economic factors that have increased pressure on unions, increased opposition of employers, changes in values and public opinion, political opposition and inadequate organising strategies on the part of unions [(29)]. The need for trade union strategies in response to these considerable challenges is widely agreed and there is evidence throughout Europe of efforts to seek such strategies. One which features significantly is the pursuit of new identities, thus there are examples in many countries of trade unions efforts to improve services and revise trade union purposes as well as attempts to define a less adversarial type of unionism [(30)]. Interestingly, health and safety has enormous potential as an instrument with which unions could fashion a new identity. However, the national reports undertaken for the present study reveal few examples of unions using health and safety in this way.

Health and safety policies and structures

Legislative Framework

One feature of the health and safety structures of many countries is that the recent direction of the development of primary legislation responsible for defining regulatory boundaries in health and safety has been towards a more comprehensive and systematic preventive system whose general features are governed by framework legislation. The harmonisation of such a framework was one reason that the Framework Directive 89/391 was passed by the European Union.

As Vogel has stated in his report on its implementation up to 1993:

"....the 1989 framework directive seems to offer a major opportunity for injecting a fresh impetus into the national debates on prevention. Despite its limitations, it embodies a comprehensive prevention programme, lays down on the employer a general obligation to provide a safe place of work seen as part of an ongoing process of improving working conditions and lays down, in outline, procedures (for information, consultation, etc.) and organisational arrangements (preventive services) through which to attain its aims."

(Vogel 1993)

At the time that this study was conducted, the implementation of the Directive was still a recent event. In some countries there was discussion concerning the extent to which implementing legislation had fully enacted the Directive's requirements and there were still others where the Directive has not been implemented. However, the trend observed in all the countries in the study was in keeping with Vogel's suggestions. The Directive has certainly stimulated debate on the principles of preventive health and safety and effective strategies for future development as well as leading to major legislative reforms in several countries such as Italy, Spain and Portugal.

Despite the importance of the Framework Directives and its Daughter Directives, it was apparent from the survey that the challenges for preventive health and safety in Europe are not only about implementation of EU Directives. Generally the legislation in many countries has not kept pace with the implications for occupational health and safety of changes that have occurred in the Organisation of employment and production, such as the growth in SMEs, the crisis in representation of trade unions, the illegal economy, casualisation of work, labour flexibility and gender issues. Nor does health and safety legislation address the ageing of the workforce or the needs of disadvantaged social groups. The extent to which implementation of the requirements of the Framework Directive will remedy this situation is debatable. It will provide an overall legislative framework and approach which is current and pertinent to these issues, which may facilitate the development of relevant detailed strategies, but it will not provide the strategies themselves.

Labour inspection

There was little criticism of the work of health and safety inspectors.Throughout Europe there is recognition of the commitment and quality of the effort made by health and safety inspectors and they are perceived as key agents in achieving improvement in health and safety at work.

The study confirmed that there are a number of general similarities with regard to health and safety inspection. Despite variation in the range of powers as well as in the qualifications required and the training for inspectors, the evolution of enforcement/compliance strategies show remarkable consistency. In most countries inspectorates were concentrating limited resources on high risk worksites. In some countries, particularly in the industrial northern European countries where the regulatory agencies have a long history, the inspectorates have evolved styles of operation that emphasize the achievement of compliance with legislative standards through the discretionary use of a mixture of advisory, educational and enforcement work. It seems clear that this style represents a pragmatic response to the wider social, economic and political environment in which it has evolved. It is based upon what it is possible for a small inspectorate with limited resources to achieve with regard to compliance with national laws and standards in health and safety.

There are clearly concerns about the limitations of the regulatory agencies. It is asserted in many of the national reports on which this article is based that such agencies are greatly underfunded and overstretched by their regulatory duties and that resources are becoming increasingly constrained.

Insurance systems

Generally, state inspection structures operate alongside those of insurance systems, although insurance has developed from a different legal base and a different location within the state structures, usually having its roots in social security systems rather than regulation. There are different models of insurance systems in Europe. They reflect the different historical development of public policy on health and safety.

There are two main approaches in Europe:

- co-managed public insurance (or private insurance approved by the state such as in Finland), where the insurance system is under the overall responsibility of a Government Department, the insurance bodies themselves being co-managed by representatives of employers and employees as well as representatives of the state. Insurance premiums are generally determined by industrial sector and the risks incurred in the particular sector. Premiums may be calculated according to actual accident/disease rates. This type of system is characterised by the insurance systems of Belgium (for occupational diseases), France, Germany, Italy Spain and Sweden.

- independent private insurance, where the employer is free to choose an insurance company. Insurance premiums reflect market forces although there maybe some general statutory guidelines on the extent of liabilities. The systems in the United Kingdom, Portugal and Ireland reflect this model. In Greece there is a mixed system of general social security and private insurance.

The significant difference between the models is the orientation of the first two towards prevention and the third towards compensation. A key factor in determining this difference appears to be the degree of involvement of the social partners and the state in the management of the insurance schemes.

As a consequence of their preventive orientation, the public and approved insurance systems are far more involved with activities such as rule making, inspection, training, research and incentive strategies promoting preventive achievements. Private insurers almost entirely restrict their role to that of compensators and limit their preventive activity to raising premiums in keeping with increased risks.

Regardless of these differences however, there appears to be a financial crisis with regard to health and safety liabilities in the insurance systems of most countries.

Preventive services

In most European countries employers are obliged by law to establish an occupational health service in large enterprises and the nature of the personnel it employs is to some extent defined. The employer is obliged to either consult or inform workers' health and safety representative organisations within the enterprise in some countries over the appointment of occupational health personnel, although this is not the case in all countries. In the United Kingdom and Ireland employers have traditionally had the greatest discretion over the establishment of occupational health services.

However, legislative compulsion does not appear to be the most significant influence on the spread of such services, the lowest figures for coverage were in Spain (15%) and Portugal (13%), while the highest were in Finland 85% and Sweden (80%), all of which have legislation which obliges employers to establish occupational health services in certain cases. In the United Kingdom, which doesn't before the implementation of the Framework Directive, 53% of employees were covered by occupational health services.

There are several models of occupational health services in Europe. They vary according to the extent to which they are dominated by members of the medical profession, such as appears to be the case in France and other Latin countries or their inclusion of other specialists such as in Denmark, with countries such as the Netherlands actually defining their composition in recent legislation. In the Dutch case this provides for an integrated preventive service composed of at least a doctor, a safety specialist, an occupational hygienist and a (psycho-social orientated) work organization expert, that may be certified under ISO 9000 quality standards.

Although the dominant model of a preventive service in occupational health and safety is one that is set up within a single Organisation, either voluntarily or as the result of legal compulsion, services that are shared by a number of enterprises also exist, albeit less frequently. The former model clearly illustrates another example of the way in which health and safety structures in Europe are most relevant to the needs of large enterprises, nevertheless, the joint services are potentially a means of serving the needs of smaller enterprises.

There are powerful economic considerations that influence the type of preventive service that exists and whom it serves. There is a discernible trend in many European countries towards not only-self funding (which traditionally is the case in the majority of countries anyway) for occupational health services, but also ensuring the cost effectiveness of such services; in this respect joint services appear to be more vulnerable than those of large enterprises. Despite these financial challenges however, there are positive efforts evident in countries such as the Netherlands, Denmark and Finland to achieve cost-effective services that cater for broad preventive needs in occupational health and safety, including those of smaller enterprises.

Employee representation

Despite significant differences in the structure of industrial relations and the styles of collective bargaining in different European countries, health and safety appears to represent an area of relative co-operation between the social partners, at least as far as can be discerned from the existence of structures and procedures at workplace, industry and national level. Most countries have national and industry level structures which incorporate the social partners into consultation and decision making over occupational health and safety. They also have legislative provisions that create representative institutions at the workplace in the form of safety delegates and safety committees, with some variation from country to country dependent upon national industrial relations cultures.

The implementation of legislative provisions on employee representation in health and safety is significantly less than 100% in all countries except the Nordic countries, with uptake being related to workplace size and sector. Representative structures are most frequent in large workplaces and possibly more evident in the private sector than in the public sector. The presence of other representative institutions and traditions at the workplace level also appears to influence the implementation of representative structures for health and safety.

The existence of legislative measures and even the creation of workplace institutions of representative participation do not necessarily equate to consensus between employees and employers over health and safety issues. There is very little research on the processes of representation in health and safety. Such evidence that does exist stresses the importance of trade union support for worker representation in health and safety, particularly in terms of the provision of information and training but also with regard to the integration of health and safety with other representative institutions and procedures at the workplace [38],[39]. The trends in trade union membership show a crisis of trade union representation in Europe. Evidence from countries such as the United Kingdom indicates that declining trade union influence has also been reflected by declining numbers of health and safety representatives. Recent research has also shown that despite the general decline of trade union power, such effects are not uniform and in some areas, such as health and safety training for example, trade unions have managed to maintain remarkable resilience and continue to make an important contribution to preventive activities through their extensive training programmes in a number of European countries [42].

Conclusions

Health and safety is in a process of dynamic change in all the countries surveyed and although the impact of the membership of the European Union is clearly an important influence on this process of change, it is important to acknowledge that there are real differences in health and safety provision between countries. Harmonisation does not mean that all workers in Europe are currently experiencing the same standards of health and safety at their workplaces or that infrastructures for health and safety are equally developed in all countries. The historical gap between countries in different stages of industrial development characterised by the north-south divide in Europe, as well as the differences between the Scandinavian countries - with their long tradition of social democracy and consensus - and other Western European countries is still evident in terms of health and safety institutions and outcomes. However the economic crisis of the 1990s, changing patterns of employment and changing management and Organisation work, government initiatives to reduce public expenditure and privatisation strategies in many countries as well as the harmonising aims of European legislative activity seems to be bringing them closer together in terms of health and safety strategies.

There are strengths evident in the national systems. They are found, for example, in the increasing comprehensiveness of the legislation and in the work of the inspectorates responsible for seeking compliance with standards in health and safety. They are also present in the widespread recognition of the kinds of problems in health and safety that require a strategic approach and in the development of preventive services as well as the involvement of the social partners at all levels of health and safety regulation.

Despite varied performance on implementation of the Framework Directive, generally, the development of systems for the assessment and management of health and safety risks in larger organisations has progressed throughout Europe. The same cannot be said for health and safety systems in SMEs. Small and medium sized enterprises (SMEs) continue to pose one of the greatest challenges to the preventive systems for health and safety in Europe, since although such systems can be shown to work effectively in relation to large enterprises, they are often not taken up by SMEs and there are frequently good reasons for questioning their relevance to the needs of SMEs. A related problem is the limited development of infrastructures for health and safety in the economically weaker southern European countries and in Ireland where the role of Smms in the economy is predominant.

There is agreement on the limitations of resources for health and safety regulation in most countries. In this respect the impact of the recession and the policies of public expenditure cuts in many countries are of widespread concern. The role of the health and safety inspectorates in all countries is regarded as an essential aspect of the development of prevention. While there is some acceptance that modification of this role in line with shifting trends and emphasis in preventive health and safety may be desirable it is also clear that a reduced role for the inspectorates as a result of economic constraints is neither desirable nor beneficial.

The assessment of the cost-effectiveness of health and safety structures and strategies is a noticeable trend particularly in northern European countries. Hard evidence of the considerable cost to the national economy of losses resulting from occupational accidents and ill health has emerged from some of these countries while at the same time measures to make preventive services more cost effective have been introduced in the same countries. This appears to be a trend that will continue to develop in the future.

Involvement of the social partners in the development of health and safety strategies from national to enterprise level of health and safety is a well established feature in all European countries. In this respect the declining trends in trade union membership in most European countries is a worrying feature of the last decade. No sustained alternative form of employee representation has replaced the role of the trade unions and research evidence clearly shows that trade union support both inside and outside the enterprise is a powerful factor in aiding the effectiveness of employee representation in health and safety.

Overall, the first half of the 1990s was one of considerable legislative activity and debate about the impact of new Directives of which the Framework Directive was merely one. Not suprisingly this is reflected in all the national reports that were undertaken as part of the study. However, this period has now passed and European countries and the European Union has entered a new phase of policy and strategy in health and safety. At a national level the study has been unable to provide much analysis of this new phase since it looked backwards for its evidence and the period with which it has been concerned largely predates these more recent developments of which deregulation and cuts in public expenditure appear to be two of the most alarming. Only the British report contains any extensive evaluation of the process of deregulation in health and safety and this is clearly because it has been an important public issue in the United Kingdom. On the other hand, the issue of reduced public expenditure and particularly its impact on the regulation and the resourcing of necessary support for health is discussed in many reports and identified as a serious challenge for the future.

The relevance of the concept of health and safety as it is traditionally perceived is also an issue for the future. Much of the legislation, the regulatory systems and the information about accidents and ill-health, as well as the recognition of what actually constitutes "health and safety" in Europe, was developed during a previous era of industrialisation and does not lend itself easily to the emerging concerns about the environment, modem employment and the post-industrial society. This represents a major challenge for the legislators, the social partners, the regulatory agencies and the specialists, but one which must be confronted if systems for promoting the well-being of people at work in Europe are to keep up with the rapidly changing nature of the risks that they face.

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NEW PARADIGM'S ?

1. NEW DEMANDS

- FREE MARKET FOR OHS
- COST & PERFORMANCE AWARENESS
- SHIFT TO CONSULTING ROLE OF OHS

2. NEW LEGISLATION

- EUROPEAN FRAMEWORK DIRECTIVE
- DUTCH WORKING ENVIRONMENT ACT (ARBO-WET)
- EMPLOYER IS RESPONSIBLE

PRO'S	CON'S

1. EMPLOYER RESPONSIBLE

- POLICY ON WORKING CONDITIONS
- FOCUS ON SICKNESS ABSENCE REDUCTION

2. RISK ASSESSMENT

- PREVENTIVE, SCHEMES, POLICY ...
- PUSHING OFF

3. FREE CHOICE OF OHS

- QUALITY DEMANDS
- PRICE COMPETITION

4. CERTIFICATION OF OHS

- ENHANCING QUALITY
- WINDOW DRESSING OF OHC

5. CHANGE from OHC to OHCC

- OHS AS AGENT OF CHANGE
- LACK OF
  - organisational concepts
  - expertise and strategy of organisational change
  - tools, methods, skills

OLD PARADIGMS	NEW PARADIGMS
• EXPERT ROLE	• CONSULTANCY ROLE
• INDIVIDUAL ORIENTED	• ORGANISATION ORIENTED
• SOLO APPROACH	• MULTIDISCIPLINARY APPROACH
• NO COMPETITION, LITTLE QUALITY DEMANDS (?)	• COMPETITION ON EFFECTIVENESS AND EFFICIENCY

NEW PARADIGM'S ====> NEW TOOLS

- MODEL OF OCCUPATIONAL HEALTH CARE
- TOOLS IN TOOLKIT
- TOOLS OF LITTLE USE IF NO SKILLS

=> ACCOUNT ANALYSIS / COMPANY SURVEY
instruments, methods skills (training)

=> RISK ASSESSMENT
instruments, methods
skills (training)

=> HEALTH & WORK QUESTIONNAIRES

=> GUIDELINES FOR OCCUPATIONAL PHYSICIANS

=> COST BENEFIT ANALYSIS
instruments, methods skills (training)

=> EXPERT SYSTEMS ON INTERNET

THE ROLE OF TRADE UNION TRAINING IN HEALTH AND SAFETY

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The 1989 Community Framework Directive laid down a series of general principles on workers information and participation on health and safety issues. Amongst others workers' representatives must be informed and consulted on risk assessment that is on the wide ranging definition of prevention. According to the directive, workers' representatives also have a right to training.

Though some employers have attempted to promote direct forms of participation, in most countries workers' participation is mainly through workers' representatives in various types of instances (joint health and safety committee, general representatives bodies). In some countries where such instances did not exist, transposing the framework directive entailed radical changes (such as in Italy, Spain and in the UK). But in others it gave a fresh impetus to the activity of representatives. Therefore training of workers representatives in health and safety has become a broader issue considering the wide range of their tasks. New needs for their training, the objectives and methodology of training have urgently to be tackled. However, the framework directive deals only with health and safety workers' representatives training in very general terms.

Even in those countries where trade unions' influence declined over the past decade, the overwhelming majority of workers' health and safety representatives are trade union activists. Trade unions, which have been the main providers of training to these workers' representatives, have started to look again at their training instruments. This why the TUTB made a first attempt to survey trade union training in health and safety in Europe (1).
This survey aimed at:

- giving a general overview of the workers' representatives right to training in health and safety
- ascertaining the contribution of trade unions to workers' representative training in health and safety
- evaluating the effectiveness of trade union training in the improvement of working conditions

It was been based on:

- existing (but very limited) literature on the effectiveness of workers' participation in health and safety, on training in health and safety and on trade union training , and existing internal documentation from the trade unions;
- a number of replies to a first short questionnaire on trade union training in health and safety, which was sent to the trade unions in 1994 (73 replies were received from 18 countries and from different levels in trade union organisations);
- a limited number of interviews conducted with key participants in training provisions within the trade unions. Due to limited resources and time, this survey is mostly concerned with the mainstream of trade union health and safety education and training in

only 8 member states of European Union. An attempt to capture the richness of trade union training was however made through these interviews along the idea of « good practices » in trade union health and safety training as defined by the interviewees themselves.

The results of the survey

1. The effectiveness of employees' participation in health and safety at the workplace

With the Framework Directive the representation of workers' interests in health and safety now implies the existence of a workers representatives body, whether appointed or elected by workers' at the workplace.

From the few existing reliable studies on the effectiveness of representation in health and safety, factors such as trade union membership, trade union organisation at the workplace and the integration of safety representatives into it, as well as the relationship of representatives with their constituents and the form of their interaction with a supportive management and with other institutions are important in determining the success of safety representatives' actions in the workplace.

There is a widespread feeling amongst European workers that there is a very strong link between healthy working conditions and organised trade union. For this reason, trade union training is not just perceived as a mere « service » offered to the activists and delegates. It is considered as a unique forum for making workers' representatives in health and safety more effective by developing prevention strategies rooted in the experiences, needs, desires and voice of the workers themselves.

Though not necessarily by provision of law trade union training is consistently identified as the main suppliers of information to workers' representatives on health and safety but also as an effective training. Training provided by the employers receives considerably less time and quality credit than training by trade unions.

Trade union training is perceived as particularly able to address the special needs of participants to develop and integrate health and safety representation at the work place and the methodology of trade union training plays an important part in its effectiveness. Also, trade unions are considered to be much more pro-active to new problems and issues on health and safety. Therefore, trade union training is consistently described as an essential part to the health and safety representatives' effectiveness.

2. The recipients of trade union training

National legislation has now incorporated the activity of workplace representatives in health and safety. However there is a wide lack of information on these representatives even on their numbers and comparison on potential recipients to trade union training in the various countries is not possible.

Another limitation comes from the fact that legislations set a minimum workforce at the workplace before making the statutory requirement or allowing the right to set up the representation of workers' interests in health and safety. This legal floor varies from one country to another, (e.g.5 workers in Sweden) A 50 workforce is a common figure, (e.g. in Austria Belgium) , leaves a very large number of small firms outside the right to workers' participation in health and safety. Besides in some sectors there is no right to workers' participation in health and safety (such is the case in the public administration in some countries). Finally, the size of the workers representative bodies varies from one country to another and also from sectors of activity. The duration of their mandate is also very different from one country to another (most frequent duration is two years).

On the other hand, in many countries the compliance with the obligation to set up the representation of workers' interests in health and safety is not known. Finally, trade unionism varies greatly from one country to another and within sectors. There are very few overall evaluation of the percentage of unionised workers' representatives though a large majority are trade union activists.

For all those reasons, it is not possible to make an overall evaluation of the potential recipients to trade union training in health and safety. However, the most common profile of a workers' representative in health and safety is that of a man, a trade union activist, working on a full time contract, for the large industry sector.
Though the recipients of trade union training in health and safety are mainly workers' representatives in health and safety, it is also important to underline that trade unions provide training in health and safety for others : affiliated workers, others workers' representatives (delegates, representatives in works' councils), trade union officials and trainers for instance.
The potential number of recipients for trade union training is therefore very large, though time credit and resources for training are generally limited.
As far as time credit is concerned, workers' representatives right to training (first training, continued training) has first to be examined. Denmark is the only country where by law workers' representatives must be able to take their training in health and safety within a certain period of time after they have been elected. In most countries there is just a mere right to training leave for newly elected representatives (five days is common). Right to continued training is less extended even if workers representatives do have in most countries some right to take a leave for trade union training during their mandate (such as 5 days per mandate in France to 6 weeks in Austria). Provisions for continued training are in most countries considered to be too weak and too low. Besides, many trade unions claim that too many representatives are not able to avail themselves of their right to time credit, whether to perform their duties and tasks as workers representatives or to take their training, due to the increasing workload on the workforce as a whole.

3. The organisation of trade union training

There is a large variety of trade union training systems existing alongside one another to address the needs of a wide range of participants to develop and integrate health and safety representation at the workplace.
Trade unions may either undertake the training activities themselves or, more frequently, they have « external training resources » such as training centres, approved by legal authority and receiving funding. In some countries, like in the UK the conditions of funding are playing an

important role in opening the discussion on formal certification of trade union courses or external validation of their training. Trade unions are therefore concerned about the recognition of trade union methodology as a legitimate and valuable educational process. In a number of countries, trade unions also have their say, through joint committees, on non trade union training for approving or controlling the quality of the training. The financial resources for trade union training still represent a major and large problem. In most countries structures and procedures have recently been established and are able to support trade union training. But in some countries were these financial resources did existed, restrictions are raising the pressure.
However, all trade unions obviously place a great emphasis on trade union training as a whole and it has become a strategic resource for the trade unions.
As far as the question of the trainers is concerned, most trade unions mainly rely on their own expertise whether they call on trade union officials, experienced shop stewards or workers representatives. The methodology and pedagogy of the training has become an important and common feature of trade union training and this is why trade union trainers are seen as essential to perform the objectives of the training. There own training by the trade unions on new methodologies and pedagogies is receiving considerable attention. Technical expertise is generally brought in the training either from the trade unions or from outside.
In most countries, workers' representatives first training is mainly operated at local level but continued training is generally organised at branch level. Other initiatives are destined to trainers, trade union officials, specific groups of workers (women, minority groups) or are designed jointly for management and supervisors. Courses also may treat special issues (special risks, new dangerous substances, stress, environment).

This diversity in the organisation of trade unions training reflects on the one hand their effort to take a maximum advantage of all resources available for training. But on the other hand there is an awareness of the relative merits of different approaches to training.
Finally, this diversity reflects the capability of trade unions to be pro-active in terms of the introduction of new ideas and concepts in trade union action on health and safety. New innovative initiatives have been targeted such as health circles or networking amongst health and safety workers' representatives. With large differences from one country to another it is worth to underline that despite the decline in trade unionism and in so far the scarce resources, trade union training in health and safety has either been able to resist and still to offer such significant services or to develop both for the number of recipients and the number and scopes of the training.

4. The objectives of training

The most frequently-cited objectives of trade union training for workers' representatives include:

- giving a sound basic knowledge of legislation to assert workers' rights with the employer;
- enabling delegates to systematise workers' knowledge about the production process, without necessarily restricting them to the different specialised fields involved in health at work; hence promoting a mutually profitable interaction between what technicians know and what workers know;

- supporting workers' representatives in performing their duties (inquiries, consultation, negotiation, advocacy, contacts with the Factory Inspectorate and preventive services etc.) and to help them to involve workers more in their activities;
- making trade union action more consistent by making the activity of health and safety representatives part of an overall strategy, thereby improving the relations which representatives with a specific role in health at work have with the other forms of workers' representation and the trade union activists in their firm.

Obviously the combination of these objectives differs markedly from one organisation to another, and even within the same organisation it varies by federation, region or with other factors.

However, two common traits stand out : training is for practical use and trade union training is far more than a mere process of communicating knowledge evolved by specialists. It is designed to confer dignity on the disregarded knowledge that workers do have on their working conditions and much testimony was received on that issue. As well as developing intellectual and cognitive abilities, training plays a significant role in building up the self-confidence of delegates and workers in general. It is an important instrument in developing self reliance of workers and their representatives in prevention matters.

5 The methodology of the training

The survey contends that there is something special and unique about trade union health and safety education that makes it adequate and appropriate to the training needs of workers and their representatives. That is the emphasis on « empowerment », voice and collective actions on developing a supportive ethos amongst the participants which is a reflection of the nature of trade unionism.

This concept is of course anchored in the basic principles and approaches common to all labour education. But from the investigations in the various countries there is a number of common themes and methods which are shared by trade union courses allowing for participants' experience of their workplace health and safety issues and which in many cases are designed around these experiences, sometimes by negotiation during the delivery of the course. Courses normally tend towards collective understanding and action, rather than the acquisition of individual knowledge, emphasising the importance of shared knowledge, the collective definition of problems and effective workplace action, as well as the development of a broader understanding of the location of participant's workplace problems within a conceptual framework that is relevant to the experience of workers and which reflects not only the technical issues of health and safety but also the social and economic context of work and health.

The methodology is referred to in different countries as student or worker centred problem solving, active learning or discovery learning but the methodologies used in all countries generally feature:

- a focus that uses participants' own experiences as the basis for developing health and safety concepts and actions

- the use of different student centred active learning techniques (group work, course meeting, reporting back and workplace discovery)
- approaching workplace health and safety through a problem-solving approach which focuses not only on the technical aspects of a problem but upon the organisational issues;
- techniques that are appropriate to the participants' representative function and that foster the development of communication skills enabling participants to relate effectively to both fellow workers and management,
- encouraging participants to listen to one another and to hear their own voices, to build their confidence in ways that empower them to assert themselves and take effective action at their workplace
- encouraging participants to listen to fellow workers and develop a worker-centred analysis of occupational health as the basis of their actions.

6. Evaluation of the training

Most courses contain some form of participants' evaluation of the course itself but evaluation on the relationship between training and subsequent workplace action is very limited. However, when available such evaluation proves a positive relationship.

Indirect evidence from several research studies also point to a strong connection between training and workplace actions.
Other indirect evidence comes from the trade unions: training starts a dynamic process between the trainees and the trade union structures. Trained workers' representatives become more questioning and asking towards their trade unions either in terms of further training or in terms of trade union support to actions on health and safety issues. Trade unions have in their turn to adjust to this growing demand and to incorporate more health and safety issues into their overall platform. Trade union education is therefore an agent of change both for trainees and for the trade unions.
On the whole however, evaluation of the impact of trade union courses on preventive health and safety at the workplace is still required, not only to show the positive effect of the training but also to identify ways in which it could become even more effective.

7. Challenges to trade union training

Changes in the economic and political climate in Europe have polarised situations with regard to the position of trade unions in some members states. Changes in labour market (massive arrival of women on the labour market, ageing working population, high level of unemployment) changes in the organisation of employment (from industry to services, privatisation, tendency to downsizing), changes in the working conditions (flexible status, flexible working time), changes in management (human resources management techniques) all added to the difficulties trade unions have to face. However trade unions have responded with changes in their overall provision as well as by attaching greater emphasis to some aspects of methodology. Still, difficulties involved in outreaching poorly organised sectors and groups for instance remain huge.

For a large number of employees and representatives, access to trade union training is limited. This is specially the case for women who are under-represented both as workers' representatives and in the courses.

Nevertheless several examples are illustrative of the possible role of trade union health and safety education: study circle at local level, the appointment of full-time representatives for health and safety for a number of small enterprises or regional safety representatives.
The content of trade union courses will also have to reflect new current issues.
A gender perspective on working conditions is only starting to emerge in still very restricted sections of the trade union movement. As a whole, men and women experiences from the sexual division of labour still have to be build into the training.
A second point is the linkage between risk assessment duties and the role of workers' representatives in health and safety in forward-looking risk assessment. What knowledge can they socialise with the fellow workers and how they can verify it against purely technical knowledge.
A third issue comes from the spread of precarious and insecure employment, and the need to take into account the needs of those workers who are often placed outside the scope of the legislation concerning occupational health.
A fourth issue is the impact of training on trade union action in the workplace. In all too few cases is there any follow up to evaluate how effective training is in terms of what is subsequently done with it at the workplace.

All these questions bring back to the conditions in which general rules in health and safety are set. There is a widespread agreement that a new approach to health and safety is needed to tackle the emerging issues of the 1990s. Trade union education needs to receive better support if it is to continue to develop effective strategies to aid the improvement of the overall health and well- being of workers in the future.

(1) « Trade union training in health and safety : a survey of European Practice in Training for Workers' Representatives », by Anne Raulier (OSE, Brussels) and David Walters (Southbank University, London) for the European Trade Union Technical Bureau for Health and Safety, Brussels, November 1995, 147 pages.

INSPECTION AND CONTROL POLICIES

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Introduction

Where I am speaking from:

* Inpact is a practitioner on the demand of workers representatives on the field and a searcher in France

* I am participant in reflections at the Community level through:

  - the Advisory Committee on Health and Safety (for example in the Ad Hoc Group on risk assessment).
  - with the TUTB: development of various kinds of cooperation
  - with the ETUC: seminar on preventive services in 1995
  - Participation in reflections with Labour Inspectors (the French Villermé Association and the Permanent European Committee of Labour Inspection Associations).

I will limit my reflections to public controls (because it has been spoken just before in this workshop on multidisciplinary services), but there is of course a link between these two matters.

Concerning the title of my speech (Inspection and control policies), I will rather speak on a deficit of policies, at the Community level, as in most of the different countries). My speech will be of course very schematic and will point some difficulties or limitations.

Plan of the speech:

First Part: the context and what is at stake concerning Occupational Health and Safety Inspection and Control ?
Second Part: The consequences on Labour Inspection Practices where are we today ?
Third Part: Inspection and control policies: Which trends in the future ? Where do we want to go ?

First Part: the context and what is at stake concerning Occupational Health and Safety.

The "new phase" could be characterised as follows:

- The transcription of EC directives concerning Occupational Health and Safety allows progress but also encounters difficulties:
  - The transcription allows unequal progress according to the different countries but arises sometimes a multiplication of technical regulations, which is difficult to embrace.
  - The development of prevention principles (such as integrated approach, risk assessment) is slow and it is difficult therefore to impulse a new conception of the prevention (for example in Germany, Spain, France, Portugal).
  - The achievement of internal preventive services should allow to find new relays for public control, but this happens with differentiated rhythm, because these services do exist in certain cases (for example in Scandinavian countries), or are achieved (for example in the Netherlands),, whereas the transformation of the existing situations is more difficult elsewhere.
  - The extension of Labour Inspection to public services is an important consequence of the EC directive.

- The absence of a common legislative frame of reference concerning Labour Inspection, for which the only responsible authority is the member states' one (the juridical reference remains everywhere the ILO Convention no 81) is an obstacle to the enforcement of the EC directives.

- The spreading of standards, of guidance's of good practices (also in the matter of Occupational Health and Safety Management) could be a means for bypassing public reglementations or a supplementary support, couldn't it ?

- The changing of risks (in industries such as process industries or genetic engineering) and of the conceptions of the prevention can transform the roles, the policies and the methods of control bodies. In addition a new social actor is merging in the societies threatened by those post-industrial risks the "public". It means that the holistic approach concerns also the public control.

- The situation of the employment, the development of illegal work and the restructuring of the firms make the public control for a part illusory.

- In many countries, the reflection about the role of the Labour Inspection is beyond the social partners, at a local and a national levels (in France, for example, the National Council for Labour Inspection doesn't really exist), whereas a growing part of the law comes out from collective agreements.

- Due to the difficulties of trade-unionism, public control bodies have no interlocutor, specially in SMEs.

- The trend to privatisation of bodies dealing with prevention is present (through a balance in favour of paritary public insurance bodies or through the development of private control).

Second Part : The consequences on Labour Inspection Practices

1. **A delay and insufficient structuring of Labour Inspection activity at the Community level:** although the "Committee of senior Labour Inspectors" has been formally set up, this insufficiency is evident (as far as I know) with:

   - the lack of public initiatives or development of concrete means for cooperation between inspection bodies (such as data banks, fast communication, training) ;

   - the absence of tripartite control on the activity of this body.

   - the lack of activity on up to date matters, such as coordination in border regions.

2. **A disenchantment and difficulties to handle** in certain countries, due to the economic crisis and to the pressure in favour of a bigger flexibility of the workforce:

   - for example in France a diminution of the number of plant inspections linked with the situation of employment and of the social relations.

   - in Great Britain because of repeated cuts in the budgets.

   - in Belgium the very strong hierarchy inside the Labour Inspection seems to be very paralysing.

3. **The plurality and splitting of public bodies** dealing with prevention lead to difficulties in coordination and cooperation:

   - This situation can be pointed in Germany where these difficulties exist between Labour Inspection and the "Berufgenossenschaften", which play an important role in the elaboration and the enforcement of prevention measures, but which are not concerned by the enforcement of the federal law.

     Of course in practice a certain gentleman agreement exists. Labour Inspection concentrates its activity on fields which are not covered by the regulations for example environment or the work protection in the social matters (such as work time or children work). But the new law (in transcription of the EC framework directive) provides expressly for that Labour Inspection and BG should cooperate in prevention matters. This tends to prove that an harmonisation is still necessary.

   - In France, of course, the coordination of the activities between Labour Inspection and Social Insurance System is deficient. The consequences are an overlapping of activities and even contradictions between the two bodies.

- In Italy, the USL suffer from a lack of mobilisation, coming from the other actors of prevention : the Labour Inspection has not very much means in this field and at the different levels (local or national), the relays in these matters seems to be rather weak.

4. **The reform of the governmental structures** (in a way of a decentralisation of the decisions) puts the autonomy of the Labour Inspection in question sometimes, in contradiction with the ILO Convention nr. 8 1.

   - For example in Greece, the new law (nr. 2218/1994, art. 3) makes Labour Inspection dependent on the "Prefectory Government" (which is the elected authority at the local level), and no more on central government.

   - For example in France, the growing role of the Prefects (due to the administrative de-concentration laws) or of the police authorities (due to the fight against the illegal work) encroach up on the activity of the specialised control services, that is to say the Labour Inspection.

5. **The difficulties of the existing models:**

   - Generalist Inspections are restricted in their approaches of Health and Safety matters by their insufficient technical skills, but also their approach is sometimes limited to a formal compliance to legal prescriptions : the question of the acquisition of new know-how is important.

   - Technical Inspections, which have apparently more important abilities for a diagnosis, are faced with the question of a more global approach. The need of an integrated approach of the companies is merging, with the aim of an effective action. This is the case in particular due to the confrontation with the situations of the service activities, which are difficult to deal with the tools adapted to industrial activities.

6. **New needs appear in many countries,** such as: training in European directives, global refection on health at work, on the methodologies, which fit to the new context. These needs are linked:

   - For the "technical inspections" with the extension of their activities to environment matters (in progress in certain regions of Germany). They also tend to be interested in management systems of the firms (with the integration of the industrial relations, in the most favourable cases as in Sweden).

   - For the "generalist inspections" with the need of acquisition of their own abilities (for example concerning risk assessment), aiming to evaluate the prevention policy achieved by the companies.

Third Part : Inspection and control policies : which trends in the future ?

1. Internal control / public control:

Which balance may be obtained in a new deregulation context, considering that the cost of the public systems of inspection leads to the development of internal control or to third party auditing ? Internal control can be useful, but should not replace public control.

Actually the control by public inspection systems notably implies independence from the firms and transparency of the findings, which make possible a public space of debate : how could it be guaranteed by an internal control or by a third party auditing ? This seems to be very difficult and there is a risk of competition between voluntary and tripartite standards, which could have negative repercussions on the public authorities control. There is also a risk that formal accreditation by an external expert (the third party auditing) gives a free hand to the firms in this area, legitimising a very superficial control.

Anyway, internal or external control must not be developed instead workers participation, or (we prefer to say) workers action. I want to point very briefly that it is important for preventive services to take into account the workers viewpoint and not to impede the informal prevention practices, that is to say the workers knowledge in this field.

2. Generalist inspection or specialised inspection.

We could be confronted with a surpassing of the differences with a mutual enrichment and the definition of common goals inside the different inspection systems.

This seems to happen in Denmark : within the Labour Inspection there are pluridisciplinary abilities. The Council for Working Environment (which is tripartite) intervene in the planning of the Inspection activities. In Sweden a strong will to link health and safety matters with the work organisation and the whole strategy of the firms is also pointed out.

But the example of the Nordic countries shows that public control system works with strong trade-unions : the maintaining of an efficient Labour Inspection system is the corollary of equilibrate industrial relations. And all that is difficult to export.

3. Occupational health and public health

The appearance of events such as the mad cow disease or asbestos in the buildings could maybe allow that the principles and the policies, which have been defined and have come into force at the level of public health, have positive consequences on occupational health.

These are, for example: principle of precaution, risk assessment, important means for researches. The better link between health at work and health in the society (in the research policies, in the prevention planning) could be in favour of a new dynamics. It has been soon stated in extreme situations (i. e. the asbestos case in France or the Ardystit case in Spain) that public health system played a "watchdog role" for occupational health. It could be possible to imagine that, in a prospective way, common aims are given by both systems (public health and occupational health) for some kinds of risks which are difficult to identify or for a certain type of workers in a difficult situation (for example the precarious workers).

So in France, a new body called "Observatory of risks for health" might soon be nearly launched, with such aims, by the Ministry of Social Affairs, which will cover both public health and occupational health matters.

4. The need of a better structuring of the European frame

A better structuring of the European frame, where the action of public control services takes place, is needed. Within the Labour Inspection bottom up cooperation could be obtained on projects elaborated in a trans-national way.

But, more generally, the question of the link with the whole judicial structures and policies must be placed on the agenda in the frame of an European judicial space.

5. Which reflection on the merging of new tools ?

Some of these should be developed, for example:

- Financial penalties, aiming to dynamise the link between prevention policy and social security policy.

- Administrative penalties for the less important offences.

- Constraining measures, such as the ceasing of activities in case of important and imminent risks, with two questions:
  (i) who decides: the judge or the inspection ?
  (ii) what kind of decision is taken: with rather technical content or embracing the whole work organisation ?

6. Which contribution to the merging of new principles in the future ?

Public control services could have a special role due to the kind of activity they have in the merging of new prevention principles in the EU. But it is necessary that the reflection does not remain concentrated at the top of the administrative pyramid ? What kind of means could be given to them, on the basis of the existing (such as exchanges of information, seminars, ...) ? Initiatives could be taken with this intention (in association with the social partners). Could it be with the support of the Foundation ?

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SUMMARY OF ROSPA'S PROPOSALS FOR PROMOTING HEALTH AND SAFETY IN SMALL FIRMS

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Despite the progress which has been made in tackling workplace risks over the last twenty five years, finding more effective ways of raising standards of **health and safety in small firms** remains a key challenge for all the main players in the occupational health and safety ‚system'. Businesses employing less than 50 staff now account for about 45% of UK private sector employment. Such firms seem to have a relatively poor health and safety performance and face significant difficulties in adopting a management approach to these issues, for example carrying out risk assessments to check that appropriate risk control measures are in place.

RoSPA has recently responded to the **UK Health and Safety Commission's (HSC) public consultation initiative** on future small firms strategy, reiterating many of the points made in the RoSPA report, *'Small and Safe'* (published in March 1995). That report described some of the **main health and safety problems** of small firms as follows:

- the **"lean" management structure** of most small businesses leading to less emphasis on health and safety in comparison with other business priorities;
- more **informal approaches to management** generally - despite the growth of quality assurance systems (viz. BS EN ISO 9000).
- relative **ignorance** about sources of risk and the requirements of health and safety legislation;
- less formal **health and safety training** for both management and employees;
- a largely **reactive approach** to health and safety issues (only taking action when things go wrong);
- failure to understand that **"small" does not necessarily equal "low risk"**;
- widespread **non-membership of employer/industry organisations**, and thus less access to health and safety information from industry sources and local networks;
- **a lower level of trade union organisation** and less workforce influence on health and safety (for example via safety representatives and safety committees);
- **lack of easy access to appropriate health and safety services** and advice (e.g. professional health and safety advisers, hygienists or medical staff);
- **infrequent inspection** by enforcing authorities;

- in some cases, **suspicion of or hostility towards Health and Safety Executive** and local authority inspectors;

- **less direct experience of accidents** and work related ill-health (although incidence rates may be higher); and

- despite a general desire to contain costs, **poor appreciation of potential costs** of accidents and ill health and the relatively greater vulnerability of the small business to the effects of accidental losses.

RoSPA has reached a number of **preliminary conclusions** as follows based on HSE and other ongoing research:

- In general small firms are **not hostile** to the need for health and safety legislation and they do not regard the cost of statutory control measures themselves as a major "burden". They do however tend to see the mass of legislation and associated guidance as complicated and hard to understand, causing them to divert resources from their 'core' goals.

- In general most tend to feel that they are **"on top"** of their health and safety problems.

- On closer examination however it is fairly clear that they are **only partially aware** of the full range of hazards present in their undertakings and their awareness of risks is more heavily focused on obvious safety issues rather than risks to health.

- Their **understanding of legislation**, standards and guidance applying to their activities is, in general, sketchy at best - although there are exceptions at particular points.

- They tend not have a very clear view of what **health and safety services/advice** might be available or indeed what such services should offer their business.

- Most consider that they **do not need "hands-on" help** - although some accept that they might benefit from health and safety training - provided it was accessible, relevant and cheap (if not free of charge).

- Small firms seem **wary of the costs of consultants** - both their fees and the costs of recommended action - particularly if such consultants 'over specify'.

- Most small firms tend to see maintaining health and safety performance in terms of reinforcing messages to the workforce about **"working safely"**.

- Printed and/or audio-visual **awareness, training and guidance materials** on their own do not seem to change awareness and lead to improvements in the way health and safety are managed. Penetration in any case is poor.

- Small firms receive little or no advice from **'intermediaries'** about their health and safety service needs. They are largely unaware of what such services/help could do for their business.

In RoSPA's view, **action to help small firms** cannot be separated from **broader measures** needed to strengthen the UK health and safety system generally. A number of these which have been discussed in recent RoSPA Policy documents such as, *'Health and Safety at Work: Options for Future Progress,* include:

- more HSC/E resources;
- more preventive inspection of workplaces;
- better reporting of accidents/incidents/work related illness;
- innovative penalties where appropriate (coupled with more publicity about convictions);
- clearer health and safety law and guidance;
- a national health and safety services strategy;
- clearer training and competence standards (particularly for senior managers);
- mandatory health and safety management systems auditing;
- more effective workforce involvement; and
- economic incentives to promote better health and safety performance

The recommendations made in 'Small and Safe' did not address these wider questions but concentrated specifically on **a number of steps** which the Society believes now need to be taken to develop an effective small firms' health and safety, strategy in the UK. These were as follows:

- **Development Routes**

A series of effective development routes are needed within the business development and support system (TECs, Chambers of Commerce, 'Business Links') which will help small firms understand their problems and provide them with options for tackling them (see also recommendation on 'Acknowledged Safety Action Plans (ASAPs)' below). Such routes must combine professional advice and training with effective participation to maximise "ownership" of health and safety management by small firms.

- **Empowering Key Intermediaries**

This means that HSC/E and the other health and safety bodies should concentrate on encouraging and empowering the key intermediaries (such as TECs and 'Business Links') that can provide this sort of service. RoSPA has already completed phase one of a pilot project designed to investigate the potential of professional business advisers in 'Links' to promote better management of health and safety among the small firm clients. Large firms who engage small firms as subcontractors are another important set of 'intermediaries'.

- **Expanded Intermediary Service Provision**

The expanded provision of health and safety services by 'intermediaries' themselves (or in conjunction with other providers) should be encouraged. This will require co-operation between HSC/E and other Government Departments (e.g. DTI) as well as co-operation between intermediaries and providers themselves. Existing employer body providers in the UK like EEF, BEC and ABCC are gearing up their services as are the major consultants and conference organisers.

- **Using Information/Communication Networks**

Greater use should be made by HSC/E and health and safety service providers of information/communication networks provided by key intermediaries. This should concentrate particularly on reaching very small businesses.

- **Awareness Raising Materials**

Notwithstanding problems associated with relying only on videos and printed materials, there should be greater free distribution of awareness raising and guidance literature (with more emphasis on materials that are comprehensive and sector specific) - although it has to be accepted that specific guidance cannot be produced which will address the immense diversity of workplace circumstances found throughout the economy as a whole.

- **Consultants**

There should be more effective regulation/scrutiny (or self regulation) of health and safety consultants. Existing HSE guidance on choosing a health and safety consultancy needs further development. Also, guidance is needed for consultants on the most effective ways of helping small firms.

- **Information on Accidents etc.**

Further ways should be found to improve dissemination to small firms of information on accidents, incidents, health damage and enforcement action by sector and region.

- **Collective Interventions and 'Outreach'Work**

Collective rather than individual HSE interventions as well as 'outreach' work should continue to be developed in order to maximise HSE contact with small businesses.

- **'You Can Do It'**

HSE should do further work to encourage and evaluate new experience based distance learning approaches for small firms such as the *'You Can Do It!'* package. This needs to be combined with the proposed work with intermediaries suggested above.

- **Research Needs**

More research is needed to investigate health and safety problems in small firms, to close specific gaps in knowledge and to enhance understanding. (A list of suggested areas for research was included in Appendix One of 'Small and Safe'. RoSPA would welcome contact with researchers who may be working on these issues).

- **'Acknowledged Safety Action Plans'(ASAPs)**

Together with "Business Links" and other intermediaries, HSE should promote a new approach to compliance for small firms. This should involve "acknowledgement" by HSE and local authority inspectors of health and safety action plans developed by small firms in conjunction with professional health and safety advisers to whom they have been referred by these bodies. Such 'ASAPs', which would be based on statutorily required safety policy and risk assessment documentation jointly developed between small firms and advisers - for example, during training) would be "acknowledged" by inspectors during visits as the initial benchmark against which compliance with general and specific legal duties would be assessed. While not exempting small firms from any aspect of health and safety law, the purpose of such simple but "acknowledged" documentation would be to provide a means to create "bespoke" prescriptions for small firms which would be of value to them as working tools, providing clarification of how the general and specific requirements of health and safety law applied in their businesses.

- **Evaluating New Initiatives**

Finally, the HSC and the European Commission should continue to support and evaluate all new initiatives designed to meet small firms' health and safety needs. Findings should be reported in the annual review of small firms' health and safety resources proposed in the HSC Review of Regulation report. This review should also include an evaluation of the appropriateness of new information technology products designed to help small firms to manage health and safety.

In addition to these measures RoSPA has proposed as follows:

- the establishment of a **new high level HSC advisory committee** to help develop a national small firms' health and safety strategy;

- an enlarged role for **local affiliated health and safety groups**. (RoSPA currently provides support to some 80 local voluntary groups throughout the UK. The groups provide a means of providing 'first line' advice to smaller businesses);
- use of **'business clubs'** as an information/awareness raising conduit to small firms; and

- the development of new **'solutions' databases, toolkits,** and **distance appraisal/advice services** for smaller businesses.

In addition to its Business Advisers' Project (referred to above), **RoSPA itself** is developing new training and review packages for smaller firms as well as **further products and services** aimed at this business sector. RoSPA, in conjunction with Esso, organises an annual small firms' **health and safety scholarship**. It also publishes a bimonthly newspaper, **'Safety Express'** which is aimed at small firms.

ROSPA is anxious to enter into dialogue with other organisations about **new projects** in this area as well as to receive comments on its **broader policy proposals**.

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A WAGER ON THE FUTURE: A SOCIOLOGICAL PARADIGM FOR OCCUPATIONAL SAFETY AND HEALTH

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Introduction

The Great Western Paradigm

The 'Great Western Paradigm,' founded by Descartes, would come to be associated with far more than just science, it would become associated with what is called 'modernity' and this would spread its tentacles, carrying the spirit of reason into all nooks and crannies of Western life. It met with extraordinary success as its rationalising power helped build the wealthiest nations ever seen and, through science and education, the highest average levels education and of knowledge distribution known in human history. This was achieved through a general process that sought to crush traditions and all other imagined obstacles to the spread of reason. The idea of reason built up came to be exported, by imposition or by imitation, as though it were universally applicable.

One reason for the spread of the paradigm was the rising capacity of scientific activity to explain, and in its applied forms, to transform the world. As science grew its diverse languages became increasingly esoteric and distant from citizens. Science contributed to concentrating powers in the hands of people who had no role in producing it, the heads of large corporations and of nation states. A darker side of the modernisation process became visible, the building and concentration in human hands of destructive powers hitherto unimagined in the history of the World and the creation of ecological imbalance. From the late 1960s there was increasing questioning in the West of science and of the society it had played such an important role in producing. The very idea of universal principles of reason would come be contested, and this would have profound effects in many parts of the World.[1]

The Industrial Safety and Health Paradigm

The idea of work safety and health predominating in pre-industrial Europe was based around the general notion of causality operating, summed up in the words of Ricoeur: "if you suffer, if you are sick, if you fail, if you die, it is because you have sinned". With the rise of industrial society causes of misfortune came to be blamed on human agents, and in the case of accidents on the owners of industrial plants.

[1] Many books have, of course, been written about this process, one that has been of particular importance is, Touraine, A. 1992. Critique de la modernité. Paris, Fayard. also see the recent annals: Gross, P. R., Levitt, N., and Lewis, M. W. 1996. The Flight from Science and Reason. Annals of the New York Academy of Sciences.vol. 775.

Notions of responsibility, ideas of cause and prevention emerged that were closely linked to the development of science, technique and a legal system which responded to the problems of an industrial age. These measures together would come to form the presently dominant paradigm on safety and health at work which is, as to be expected, closely linked to the Great Western Paradigm. The world was separated into the world of things and the world of thinkers, into objects and subjects. In industrial safety this eventually translated into the concepts of 'unsafe conditions' and 'unsafe acts'. With regards health the objects were microbes, dusts and other noxious agents to be combated through vaccines, sanitary measures and personal hygiene. It took over a century, from Sir Humphrey Davy's invention of the safety lamp until the publication of Heinrich's Industrial Accident Prevention,[2] for the presently dominant paradigm to crystallise in the area of work safety. The scientific disciplines of industrial engineering and medicine, through armies of professional practitioners, would come to deal with the conditions of work. Industrial psychology was brought in to help deal with the acts, these were to be controlled through education, incentives and the resort to discipline. At a more general level, legislation, at first implemented in the name of social peace, public health and humanitarian values, built up impersonal systems of rules and regulations to provide administrative controls in order to resolve the social problems and political conflicts that accompanied the development of industrial society. It sought to simultaneously regulate conditions and to punish behaviour. In Europe the building blocks of the modern welfare state were constituted through worker compensation and those of a controlling and interventionist state through safety legislation and inspectorates. The system of thought behind these institutions constitutes the industrial safety and health paradigm.

The Structure of Scientific Revolutions

Thomas Kuhn is widely attributed with giving the word paradigm its current signification.[3] Science is seen as a self destructive activity, it advances by undermining its own bases. The central hypotheses is that science progresses when an existing theoretical system of knowledge becomes undermined by inquiry, the anomalies produced are typically left to a side and accumulate as research proceeds under the old paradigm. However, a paradigm change occurs when a new theoretical body of knowledge is produced and accepted, one that is capable of integrating both the validated knowledge accumulated under the old paradigm and its anomalies.

The Collapse of the Industrial Health and Safety Paradigm

The current situation is one of a contest of the paradigm built up with industrial society, this has occurred for two specific reasons:

1. A growing series of research results contradicted the dominant paradigm (this is the sense given by Kuhn to the basis of a scientific revolution) and, in a more practical sense, the consequences of the paradigm's limits were measured by rising accident rates in a number of countries observed in the 1970s and increasing preoccupation about worker health. Further,

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[2] Heinrich, H. W. 1959. Industrial Accident Prevention: A Scientific Approach. New York, McGraw Hill. (1st edition 1931).

[3] Kuhn, T. 1970. The Structure of Scientific Revolutions.Chicago, University of Chicago Press.

major industrial disasters from Flixborough to Three Mile Island and Chernobyl were widely interpreted as evidence of the inadequacy of the paradigm.

2. The nature of economic activity suffered considerable mutation in the more advanced Western countries. Shrinking size, the 'putting out' of productive activities, the flattening of hierarchies and an increasing resort to consultancies were among the changes transforming the face of large productive organisations. Investment in knowledge replaced investment in the division of labour and machinery as the central growth producing process. This led some to hypothesise that a new form of productive society was being built. To mark its difference from the one that had gone before it some call it 'post-industrial'. New sources of power and new cultural patterns emerged, representations of productive activity changed, certain social conflicts consequently lost their force or became increasingly institutionalised (ex. between capital and labour in the industrialised countries) and social conflicts emerged around new themes. One significant new site of conflict was built up, it is expressed in that fact that considerations relating to 'risk' became central in the running of modern complex societies.[4]

Four distinct demands can be observed and seen as responses to these twin movements: the application and extension of the principles of the industrial safety and health paradigm, the submission of actions carried out by professionals and the state to cost-benefit analysis, the depthening of hyper-rationalism in the form of systemic safety and, in the health area, what Diana Chapman Walsh calls 'workplace wellness programs,'[5] and, least well defined of all, the call for approaches based in the social sciences. The responses mixed reflection, strategies for professional and state action, and strategies for research. They constitute concrete signs of both the shoring up and the disintegration of the old and yet do not provide clear signposts on what new approaches might include and how to get to them.

Towards a Cartography

The industrial safety and health paradigm operates in three distinct spheres of social reality: as a macro level frame of reference and site of conflict for the whole society, institutions of various kinds seek to build up knowledge and subsequently apply it aggregating power, economic and organisational resources and at a micro level the knowledge and conception of the world built up within the paradigm are applied so as to reshape workplaces in the name of safety and health. As has been stated diverse disciplines have traditionally studied health and safety: psychology, engineering, medicine and, more recently, ergonomics.

Traditionally sociology has avoided the area. In recent times, however, because of the limits reached by the industrial paradigm sociological insights have been increasingly sought by some representatives of the disciplines and especially by those who perceived that the negation of the role of a socially constructed subject, a negation that is explicit in the dominant paradigm, constituted a missing analytical piece. What kind of insights can a sociological perspective develop? At a macro level historical sociologies of science and of the State are equipped to provide explanations as to the origins and working of the industrial paradigm. At the institutional level concrete practices by scientists, professionals and administrators are

4 See, for example, the Fall 1990 issue of Daedalus which was entirely devoted to the analysis of risk. A European analyis can be found in Giddens, A. 1991. Modernity and Self-Identity. Cambridge, Polity Press.

5 Walsh, D. C. 1987. Corporate Physicians. New Haven, Yale University Press.

produced, the sociology of the professions is but one sub-discipline which seeks to analyse and explain interventions made by social actors in their distinct areas of expertise. Finally, at the micro level, a sociology of work concentrates on the social processes which produce accidents and illness in workplaces.

The industrial paradigm provided a coherent view of the interventions necessary at the institutional and micro levels, its questioning poses a series of challenges, and leads to calls to rebuild 'the system'. In each of the disciplines which study the question researchers and theoreticians can be found seeking to provide responses to the new context without abandoning the knowledge acquired in the old. The question becomes "where to start?" A sociologist embarking on the adventure of writing about a new paradigm is obliged to navigate in the turbulent and waters produced these by disciplines, however, it is prudent to start with those representatives of the disciplines that are closest to a sociological approach. Uta Gerdhardt provides a warning that must be heeded in this enterprise: "sociology is an analytical science while medicine (and the same may be said for other disciplines in the field of industrial safety and health) is a practical endeavour. The latter may avail itself of various insights of the former, if they are carefully researched. But never should sociology which, within the confines of medicine, is at best one of its theoretical disciplines attempt to overcome or replace medicine. The danger hidden in such an undertaking is that sociology itself forgoes its roots and abandons its tenable aims. Its roots are in the theoretical reflection of societal goings-on. Its tenable aims are the systematic description and methodical explanation of social life and social structures."[6]

Insights on the Emergence of a New Paradigm

Macro level

The overall risk of accident or illness that a category of workers has is the result of complex set of processes in the cultural, political and organisational spheres in a given society. Rosner and Markowitz's book about the history of silicosis in the United States this century detailed the mechanisms by which a known disease inducing agent was kept out of the public debate and not officially recognised as a cause of industrial illness. This occurred at the same time as different scientific research policies and political relations kept silicosis in the public arena and guaranteed its recognition in Germany and England.[7] In a way similar to silicosis new work processes may produce new risks, these may creep up undetected and remain unrecognised, as did repetitive strain injuries (RSI), for relatively long periods because the available monitoring systems are not designed to detect them. However, the mere fact that a problem has been detected does not mean that attempts will be made to resolve it! For this to occur science and technique need to mobilised to devise prevention strategies, and such mobilisations are typically political in nature. Subsequently strategies are implemented to control exposure to those agents that are defined as inflicting damage on exposed populations. Specific mobilisations of science and technique are to be analysed at the institutional level and the actual implementation of preventive measures is to be analysed at the micro level.

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6 Gerhardt, U. 1989. Ideas About Illness. New York, New York University Press. p. 351. the comment in parentheses is my own.

7 Rosner, D. e Markowitz, G. 1991. Deadly Dust: Silicosis and the politics of occupational disease in Twentieth-Century America.Princeton, Princeton University Press.

Not only do different countries have different industrial and labour market structures but they may exhibit quite varied approaches to similar industrial risks, furthermore the empirical results of similar preventive efforts may be quite different. Obviously this Third European Conference on Monitoring of the Working Environment seeks to unite current and improve the state of future knowledge about such matters.

Most monitoring and control processes used today are based in the industrial health and safety paradigm. This is, as previously stated, a paradigm based in a world view grounded in a particular type of reason and even though it is under increasing attack its advocates seek to impose this vision in producing knowledge and interventions.

The rise of new technological threats has accompanied a loss of public confidence in traditional ways of managing risk. In particular the idea, propagated within the industrial paradigm, that there exists only one kind of rationality, has come under attack.[8] The management of peoples' relationships to risks in the economically developed societies is, as shown by social movements from ecologists to Aids activists, relevant to more than just scientists, professionals and bureaucrats, workers' representatives and employers. The triadic relationship between employers, workers and state and professional control agencies built up around the industrial safety and health paradigm in the First World is unbalanced by the introduction of a social new actor which, for want of a better conceptualisation at this stage, can be called 'the public'.

The journal Risk Analysis clearly reflects the importance of 'the public' as a force to be dealt with. Over the years it has included a large number of articles which place emphasis on public participation in decisions affecting the installation and management of plants which may result in the exposure of citizens to hazards. Such participation is seen as a strategy to educate the public and to guarantee its confidence and control. Articles also discuss the need for "scientific assessment of risk and a responsive consideration to the public's perception of risk".[9] Decisions which the industrial safety and health paradigm had isolated as being merely technical, administrative and economic are thus thrown into an arena where they are treated politically, however, the aim of professionals and industry is that this treatment occur under conditions controlled and built up with reference to the dominant industrial paradigm-reinforced through reference to the esoteric equations of systemic safety or cost-benefit analysis.

Public participation in such decision-making processes may not follow the designs of those who seek to control it. Should it come to be widely accepted as a principle for the managing of the relationship between the public and hazards in the context of a democratic society it can be hypothesised that this would open up a space for the contest of and possible social control over the complex built up by scientists and the decision-makers they serve. The institutionalisation of such a space would make a specific contribution to the dilution of the enormous power this complex has built up. In another context Goulet has observed that "it is

8 The conception that there are at least three distinct types of rationality operating in society: 'absolute rationality' which is propogated by engineers and administrators, 'social and cultural rationality' which is held by the general public and the intermediate 'bounded rationality'. see Perrow, C. 1984. Normal Accidents. New York, Basic Books. pp. 315-324.

9 Hunter, R. L., Layton, D. W. and Anspaugh, L. R. 1994. Opportunities and impediments for Risk-Based Standards: Some Views from a Workshop. Risk Analysis. vol. 14, no. 5, pp. 863-868.

preferable to have large numbers of non-expert people gain some understanding of what consequences technical choices have on their society than to have a tight knit team of experts committed to make certain technologies work."[10]

At a macro level the appearance of the new social actor is forcing institutional moves that place scientific and technical decisions into a new perspective. Citizens, previously ignored in the construction of technological choices, except through the building of technical and administrative responses through political processes, now become integrated into these processes. Changing cultural values come to be reflected in new institutional practices and in redefinition of basic concepts of democracy.

The Institutional Level

Many institutions have been built up to develop and administer the industrial safety and health paradigm. Bodies of knowledge are developed which may be theoretical or practical, and members of the institutions seek to apply them in concrete work situations. They claim legitimacy on the basis of their competence in the sphere where information is produced, distributed and applied and, in the case of the State, legitimacy is claimed on the bases of competence to exercise roles accorded by law.

Institutions mediate between the micro and the macro levels, members of institutions, be they safety engineers, industrial doctors, ergonomists, government inspectors or safety and health researchers act both within institutional systems and intervene in workplaces in ways that can affect peoples' day-to-day lives. What is relevant or irrelevant in constructing or responding to hazards is, in theory at least, determined solely by the member's disciplinary or administrative training. In times of changing values and technologies the relevance of earlier training may be put into question, members may no longer be able to perceive problems and suggest strategies to combat them.

Like all other types of workers, professionals and public servants (who I shall call administrators) work within systems of social relations. What differentiates professionals from other workers are their lengthy training periods, their specialist skills and the reference they make to their own autonomy. Administrators differentiate themselves by their claim to serve the State through the application of what Weber characterised as legal-rational authority. However, let us imagine for a moment that institutional members trained within the industrial safety and health paradigm have perfect knowledge of all relevant aspects of the task as defined by their discipline or institution. They are frequently found to claim that their autonomy excludes them from working within systems of social relations which are capable of distorting their judgement. The sociology of the professions has spent a great deal of effort in analysing professional action and claims of autonomy. One of its discoveries of utmost relevance to this paper is that employment status affects professional judgement. Eliot Freidson discusses the limits of professional action in large firms and develops certain generalisations. He indicates that doctors in these firms normally have less autonomy to make their diagnoses in a proper manner than do liberal professionals.[11] Those who work in large organisations appear to have

[10] Goulet, D. 1994. Participatory Technology Assessment: Institutions and Methods. Technological Forecasting and Social Change.vol. 45, pp. 47-61, citation on p. 49.

[11] Freidson, E. 1994. Professionalism Reborn: Theory, prophecy and policy. Cambridge, Polity Press.

more political autonomy than those employed in smaller organisations. The literature on industrial safety and health professionals demonstrates that the time allowed for medical diagnoses may be eroded in fee for service payment systems. Cost-benefit calculi or pressure from superior actors influence decisions thus, for example, inducing engineers to alter their professional judgements that certain types of equipment are unsafe, or that work should not be executed in specific situations.[12]

The types of actions by institutional members that have just been described were not contemplated in the industrial safety and health paradigm. Any new paradigm formed must include reference to the social relations within which professionals work and the constraints upon their action which these lead to: the roles played by power and economic relations in shaping their actions and the deficient qualifications which combine to limit the validity of their claims to a monopoly of competence within their defined areas of action.

Fragmentary attempts to build a new work safety and health paradigm reflections from the institutional sphere

Traditional work safety and health management has sought to control the hazards to which people are exposed through standardising protective procedures. Members of institutions contribute to investment decisions which result in certain degrees of intrinsic hazard being present in a given workplace. Peoples' relationships with these hazards are then managed. The industrial paradigm is partial and omitted a whole series of factors of relevance to life at work, workplaces can be poorly organised and people are unaware of certain hazards. People can be motivated to expose themselves to hazards for personal gain and, in situations such as those where safety and health are traded off against profits, people may become pressured to work with known hazards. Beyond this new and non-mandated risks are constantly being produced.

Researchers and theoreticians, it should be of no surprise, are introducing new reflections into the literature in order to permit reflection on the themes which their disciplines are obliged to confront. I will now turn to draw out a few insights that I believe are of importance for the development of a new paradigm.

As early as 1972 psychologists Hale and Hales' pioneering review of the relevant European literature led them to observe the insufficiencies of accident research conducted within the dominant paradigm. For them research should generate new prevention techniques, in order to do this they concluded that "radically new theories are needed."[13] Only later on could a loose form of consensus be seen to emerge as to the directions in which research should go.

It would be surprising were the search for a new overarching body of knowledge in the area of health and safety at work dissociated from wider movements in the economy and society. In 1989 the Head of the FAST programme stated: "What the economy and the firm

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[12] see: Dwyer, T. 1992. Industrial Safety Engineering- Challenges of the Future. Accident Analysis and Prevention. vol. 24, no. 3, pp. 265-273.

[13] Hale, A. and Hale, M. 1972. A Review of the Industrial Accident Research Literature. London, Her Majesty's Stationery Office. p. 81.

need is more and better human and organisational innovation. This calls for a qualitative jump in the understanding of how humans interact with technology and, above all, in the design of increasingly complex techno-organisational systems. Most of the current inefficiencies, failures and accidents in advanced automated production systems are due to system design approaches which do not sufficiently take into account interactions between human, organisational and technical elements."[14] Such words give high-level backing to the views of numerous researchers.

Sociologist Charles Perrow analysed human factors engineering and demonstrated that its assumptions precluded considerations relating to the role of a series of important social elements of the workplace.[15] He urged a strengthening of the discipline through reference to such elements. Leading ergonomists, perceiving the limits of the industrial paradigm in various spheres, have, for quite some time, been urging a reformulation of key principles of the discipline. Such a search is complex because the grounds of the discipline are shifting especially due to the emergence of new themes. De Montmollin provides an overview of the empirical content of the discipline: "Today the former supremacy of the physical, and above all the physiological sciences is questioned by the rise in cognitive sciences and in particular cognitive psychology which, thanks to the widespread introduction of computers, allows the human factors ergonomist to focus his attention less on lifting and more on the interfaces between operator and computer.... Here, 'workload' obviously implies mental workload, the object of much experimental research."[16] Beyond this change in empirical focus the bases for analyses are shifting. Thus, 'macro-ergonomics', 'participative ergonomics' and 'activity oriented ergonomics' each seek to provide new foundations for the discipline.[17] Although strictly minority movements the participative approaches are important for the rupture they make, which also follows in the tradition of French activity oriented ergonomics, by including reference made in constructing their analyses to a previously omitted factor, the workers' voices, as an expression of perceptions of lived out reality.

In the medical area Armstrong observed that a barrier was held up by British doctors who objectified conceptions of diagnosis, an approach which led to only visible ailments being defined as capable of treatment. In an article published in the early 1980s he saw that medical diagnosis had reached a point where "the conditions of possibility" for "an extended patient's view, whatever its empirical support, have begun to occur over the last few decades and this of itself (besides its ramifications into patient representation, community politics, patient's rights, and so on) signifies a change in the status of patienthood."[18] In other words, an industrial doctor working within the approach referred to by Armstrong captures worker's voices and actively employs them in constructing diagnoses. Despite widespread support for the use of the patient's view Armstrong doubts that general clinical practice in England had been modified in

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14 Petrella, R. 1990. in Warner, M., Wobbe, W. and Brödner, P. 1990. New Technology and Manufacturing Management: Strategic Choices for Flexible Production Systems. Chichester, John Wiley & Sons, p. xi.

15 Perrow C. 1983. The Organisational Context of Human Factors in Engineering. Administrative Science Quarterly. v. 28, December.

16 de Montmollin, M. 1992. The Future of Ergonomics: Hodge Podge or New Foundation? Le Travail humain. vol. 55, no. 2, pp171-181, citation from p. 173.

17 de Montmollin, M. 1992.

18 Armstrong, D. 1984. The Patient's View. Social Science and Medicine. vol. 18, no. 9, pp. 737-744. quote from p. 743

function of this newer vision. Dodier, on the other hand gets down to specifics and in an ethnographic study provides close observational detail on how some French industrial doctors use the patient's view in constructing their diagnoses.[19] A systematic attempt to incorporate such a perspective into industrial medicine was made with the Italian workers' models. Developed from the early sixties these now constitute a distant landmark.[20] In more recent times Behavioural Medicine, supported by a considerable body of psychological theory, has arrived on the scene.

In engineering de Greene has seen a need for a "paradigm shift" in order to confront the challenges of complex technologies. His prescription states, among other things, that "Equipment and jobs should be designed simultaneously, and to the extent possible the users should also be the designers."[21] In "Beyond Mechanization" Hirschhorn develops compatible arguments in raising doubts as to whether a phenomenon emergent in recent times, highly complex industries, can function safely without taking into account the workers, their perceptions, actions and views. Reflecting on Three Mile Island and other nuclear reactor incidents he argued, "we must design jobs in such a way that workers can effectively control the controls, modifying them and regulating them to prevent failures and errors unanticipated by the engineers." In the systems he proposes workers must be able to form an integrated vision of what goes on in their area, and have the capacity to take corrective action. Workers need to be able "to understand the consequences of their control decisions." For this to happen a whole set of new considerations need to be integrated into the design of workplaces: "New technologies... demand that we develop a culture of learning, an appreciation of emergent phenomena, an understanding of tacit knowledge, a feeling for interpersonal processes, and an appreciation of our organisational design choices."[22]

Whilst de Greene urges a "paradigm shift", and Hirschhorn was quite precise in specifying in 1984 that the form of integration between the technological and social system is of major importance, it is Sheridan who, writing in 1989, provides a blunt view of the state of the art: "The author has been working for many years to get engineers to see the more predictable aspects of human behaviour as legitimately within engineering design. It is a bigger chore to get engineers to see technology as an infrastructure of artefacts placed between people, a medium through which people communicate with themselves and each other, which both enhances and constrains how they interact. Eventually, however, it is essential that the systems design engineer appreciate the responsibility for shaping human behaviour. In this sense the design of a technological system with which people interact is design of human behaviour, or to put it bluntly, design of people."[23] Sheridan's analysis still gives a primordial role to the professional, however it is a role structured in a new way, as with Hirschhorn it is seen that professionals must alter their manner of conceiving the conditions and constraints within which peoples' relationships to their work are managed. Such conditions and constraints

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19 Dodier, N. 1993. L'Expertise médicale. Paris, Métalilié.

20 Berlinguer, G, Conti, P. and Smargiasse, A. 1990. Research Strategies and Preventive Models in Work. in Enander, A et ali (eds) 1990. Work and Welfare. Karlstad, Sweden, Research Unit for Work and Working Life.

21 De Greene, K. B. 1991. Large Technology-Based systems and the Need for Paradigm Shift. Technological Forecasting and Social Change.v. 39, no. 4, pp. 349-362. quote from p. 360

22 Hirschhorn, L. 1984, Beyond Mechanization.Cambridge, MIT Press, pp. 158-169.

23 Sheridan, T. B. 1989. Designing Complex Technology: Understanding it as of, by, and for people. Technological Forecasting and Social Change.pp. 89-97, quote from p. 90.

are carriers of workplace hazards. However, he also observes great difficulties in converting fellow engineers, prisoners of the industrial paradigm, to a viewpoint that incorporates human behaviour.

Consistent reference has been made to the knowledge, motivations and acts of those who work with work hazards. In so doing the authors examined propose a fundamental break with the industrial paradigm. The acquisition of an understanding of the role played by the objects of disciplinary action is viewed as inseparable from the knowledge and motivation that subjects have in relation to these objects. This principle - common to the views highlighted here - can be wagered on as a necessary but not a sufficient viewpoint from which to build a new paradigm.

Any new paradigm must necessarily incorporate both elements included in and omitted from the former paradigm, be clearly structured, obey the principles of formal logic and have clear criteria for explanation. These are prerequisites for scientific progress. Let us now consider some of the proposals made by representatives for their disciplines before moving on to suggesting some key lines of a sociological theory.

Proposals

British ergonomist John Wilson asks whether access to workers' views, as expressed in participative strategies, can be seen as a "framework and a foundation for ergonomics". He builds up his case through reference to a series of classical themes found in the literature on participation, including considerations as to the roles of knowledge and power in the process. He gives strong emphasis to the importance of the French approach to ergonomics which seeks to systematically capture worker knowledge and orientations when designing interventions. Wilson then goes on to formulate a prescription for implementation, he states that the participative "process must be voluntary, collaborative, subjective as well as objective, relaxed, non-directive (but must have direction and purpose), iterative, dynamic, flexible, allow compromises, and must aid creativity. A tall order! However, that is not all; in the wider literature we also see that the process requires adequate time, and that the participants must have access to information and external expertise and also have sufficient knowledge and experience.... To achieve all this the ergonomist must play the roles of facilitator, group consultant, technical advisor, and problem solving assistant, as well as (subtle) educator, advocate, and supporter."[24] Participative ergonomics, although appearing in close harmony with the general lines of reflection set out by members of other disciplines, has yet to build a clear view of its contribution to new and coherent theoretical reflection within the discipline.

Other proposals are less applied in their focus. De Greene, in a recent essay, saw the need for a "new cognitive/emotional paradigm in order to comprehend and to fit the emerging systems dynamics of irreversible evolution, transformation and structural change."[25] However, he writes of the difficulties of imagining the philosophies and designs that might best fit the overall environment of the future her projects. "With imagination should come insight also into

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24 Wilson, J. R. 1991. Participation - A Framework and a Foundation for Ergonomics? Journal of Occupational Psychology, vol. 64, pp. 67-80. citation from p. 75.

25 de Greene, K. B. 1994, The Rocky Path to Complex-Systems Indicators. Technological Forecasting and Social Change. vol. 47, pp. 171-188. citation from p. 186.

needed new kinds of systems indicators." In Sheridan's words: "Essentially what is called for is design of the 'social system', including organisation policy, and motivational elements, jointly with the design of the technical system."[26] De Montmollin, reflecting on the future of ergonomics, goes on to propose a programme that could "link up the current plans of anthropological ergonomics... and in this way come closer to the ideal objective, still in a stage of wishful thinking at present, of an autonomous science of work."[27]

These proposals have been built up, as one might expect with pioneering efforts in diverse disciplinary fields, in ways that are un-integrated. However, at least four elements can be retained as building blocks of further investigations:

1. the importance for initiatives taken within the natural sciences (e.g. the design of equipment and other elements of the technical system) to be interpreted from the viewpoint of the social sciences (e.g. how the equipment is processed within social and cultural settings)
2. the importance of arriving at an understanding of workers' knowledge of the workplace
3. the importance of understanding worker motivations to act.
4. the difficulties in building new understandings and, from de Greene, the importance of creativity in the process.

Micro level

Preamble

My principal wager is that the atoms that will make up the basis of a new theoretical approach are to be found in the analysis and interpretation of the actions of individuals, as carried out in systematic fashion, in the process of executing work on a day-to-day basis. Work occurs within the context of constraints built up by prior and concurrent actions at the macro and institutional levels which articulate into the workplace. Thus, legislative, investment, cultural, biological, political, technical and economic factors acquire relevance in workplaces. The theory built up is independent of the size of the workplace or of the type of contract within which the worker is employed. In the process of producing goods and services workers enter into relationship with the above listed and other factors and in the process of their organised interaction with these accidents and ill-health are produced.

Workplace accidents and illnesses are produced systematically. Key theoretical categories of classical sociology of work can be used to conceptualise the workplace. A key concept used to understand the execution of work is that of the social relation, social relations are the modes in which peoples' relationships to their work are managed. That social relations of work produce industrial accidents and illnesses is the key proposition underlying the theory to be outlined.

[26] Sheridan, T. B. 1989. p. 94.

[27] de Montmollin, M. 1992. p. 180.

Sociological Theory - Introduction

A sociological theory of accidents and illness is composed of two analytically distinct moments. In the first the workplace is seen as made up of a series of 'givens' - machines, labour force, materials, trade union systems, legislative prescriptions, product markets - that are formed by the working through of social relations external to the workplace, social relations discussed previously at the macro and institutional levels. Such 'givens' are changed either through the alteration of the social relations that produce them or through policies which determine that different sets of 'givens' be assembled within a workplace. In a second moment these 'givens' are assembled in the workplace. Through their insertion into systems of social relations of work, and through the transformation of these, goods and services and industrial accidents and ill health are produced. It is this second moment that I will discuss from now on.

Social relations of work can be conceptualised as existing at three levels: rewards, command and organisation. In addition there exists a level of reality, the individual member level, at which behaviour occurs which is not explicable in terms of a theory social relations.[28] The use of the term 'level' does not imply the existence of a hierarchy, rather the term refers to a conceptual distinction between analytically distinct systems of social relations. Although the levels are distinct from an analytical viewpoint they are interrelated. A change in one may alter the way the other operates and this may affect productivity, quality, industrial action or exposure to hazards. Questions are constantly raised in the minds of individual workers about the knowledge they have of the tasks to be performed, the orientations they have towards working with known hazards and their power to resist these. To restate what has been already laid out, peoples' relationships to the hazards of their tasks are managed through social relations and through such management accidents, ill health and well-being are produced.

It is perhaps worthwhile to reflect upon accidents and ill health against the background of the current emphasis to be found on 'benchmarks' within managerial theory and practice. The execution of work has, as the multiple 'benchmarks' invented to measure performance demonstrate, many faces: production, productivity, quality, scrap, waste, breakdowns etc. In an analogous fashion two 'benchmarks' of central relevance in this paper are health and safety. Health and safety, like any other benchmark, can be decomposed into various further sub-parts. Shannon has suggested that small accidents have different causes to big ones, some chemical agents used in workplaces cause instant ill health whereas others have long latency periods. Other measures of ill health such as medically defined stress as demonstrated by Karasek and Theorell[29] or as in much researched and albeit ill defined (from a traditional medical viewpoint) repetitive strain injuries[30] and certain psycho-pathological reactions as revealed by Dejours and

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[28] for a full statement of this sociological theory as it treats industrial accidents see: Dwyer, T. 1991. Life and Death at Work: Industrial Accidents as a Case of Socially Produced Error. New York and London, Plenum. pp. 87-160.

[29] Karasek, R. and Theorell, T. 1990. Healthy Work: Stress, productivity, and the reconstruction of working life. New York, Basic Books.

[30] see Bammer, G. n. d. Work-related Neck and Upper Limb Disorders - Social, Organisational, Biomechanical and Medical Aspects. Canberra, Australian National University.
Bureau of National Affairs 1991. Cumulative Trauma Disorders in the Workplace: Costs, prevention and progress. Washington, D.C, Bureau of National Affairs.

Roberts[31] have been demonstrated to be intimately linked to the way in which peoples' relationships to certain task structures and their contents are managed.

Organisational level

A worker arrives in a workplace with adequate or inadequate knowledge to successfully complete the task, 'successful completion' may, of course, be defined in many ways. Task related knowledge is a concept too complex to investigate here, it has been studied principally by psychology and, in recent times, by ergonomics. However, task performance may be interrupted or affected by phenomena produced in areas outside of the responsibility of the worker. Here we speak of disorganisation. Furthermore, where task structure is narrow and tasks repetitive the worker is faced with little variety, in certain cases these features produce the well documented negative effects of routine work.

Knowledge about the hazards of one's job constitutes a first mechanism with which to avoid defined negative effects of under-qualification. However, knowledge of one's job is not sufficient to avoid the other two social relations identified at the organisational level. Typically disorganisation can be combated via the adoption of mechanisms that seal off discrete parts of the workplace from others, other methods include tight coordination, feedback and routine maintenance. Routine work can be combated through a variety of techniques including job enlargement, job rotation, rest pauses and, where certain types of postures prove unhealthy, by exercise. All such mechanisms can be developed via two distinct strategies, via management or worker efforts.

Technical choices, and this is a constant theme in recent engineering and ergonomics literature, need to studied in order to examine how they articulate into the day to day lives of people in the workplace and thereby produce consequences. Hirschhorn details how certain tasks have been designed to be so complex that workers are simply unable to develop the level of qualifications necessary to run them, and in consequence, accidents, physical and mental disorders are produced. His suggestion is that design consider worker capacities to learn and to run complex systems, in other words, that systems be designed in such a way as to systematically eradicate disorganisation and under-qualification.

Professionals have an important role in diagnosing ailments. A keyboard worker may feel shoulder pain, the chances are that an industrial doctor with a traditional orientation will arrive at a different understanding to a doctor who investigates the worker's perceptions of her own complaints. In the traditional diagnostic process the perceptions and knowledge workers have of their workworld is not accorded legitimacy unless accompanied by visible symptoms. Diagnoses are made in a manner that excludes detailed investigations of the complaints as to the states of pain and the subjective meanings which workers attach to their cause, the investigation of the latter would be of use in revealing the mechanisms through which reported disorders are produced. The lack of a detailed examination of the nature of pain frequently results in workers' experiences being disqualified as, for example, they are told that their complaints are 'nothing to worry about'. In such a manner the doctor-patient relationship

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31 Dejours, C. 1993. Travail: usure mentale. Paris, Bayard. (new edition)
Roberts, J. T. 1993. Psychosocial Effects of Workplace Hazardous Exposures: Theoretical Synthesis and Preliminary Findings. Social Problems. vol. 40, no. 1, pp. 74-89.

becomes a factor in both the production of a lack of knowledge and of ill health. Lack of knowledge maintains the status quo, new knowledge produces demands for change.

"Right to know" legislation is an institutional response to the existence of disorganisation and under-qualification, it seeks to foster a perfect state of knowledge with regards the hazards of the job. Where workers labour with complete knowledge of all relevant hazards produced outside of their own bodies neither under-qualification nor disorganisation can be diagnosed as producing their accidents and ill health. It thus becomes necessary to investigate the roles played by social relations at other levels in order to understand their actions.

Command level

At the command level the relationship between workers and the hazards of their work are managed through the use of power, this may be covert and accepted, as in the case of voluntary servitude, or overt and resisted, as in the case of authoritarianism. The operation of this level to the employer's benefit is guaranteed only through the absence of a resort to collective action on the part of the workers, resort that is capable of opposing the employer's use of power, the basis of this guarantee is the absence of integrated workgroups. Thus the third social relation at this level, workgroup disintegration, is, as its name implies, a mode of managing people's relationships to their jobs whereby interdependent workers involved in the same task lack the capacity to communicate effectively.

Workers are aware, for example, that certain chemicals have dangerous long-term consequences but define working with them as a 'part of the job', as normal. While such definitions may result, as Dejours has found, in workers developing psycho-pathological conditions, it can be said that the relationship between people and the hazards of their jobs under such conditions is managed by voluntary servitude. In other cases the hazards may be more immediate and the motivation to work with them come from an entirely different source - fear of punishment. Here the person's relationship to the hazards of her work is being managed by authoritarianism. Finally, ineffective integration between workers engaged in interdependent tasks that involve hazards has been demonstrated to lead to accidents. Thus, work designers must ask if jobs require interdependent work and, should they do so, if adequate provisions have been made for communication among workmates. Such an interrogation can only be replied to adequately when reference is made to real and not hypothetical practices in workplaces.

'Consciousness raising' may attempt to convince workers that hazards should not be viewed as normal conditions of work. The strengthening of union and collective power serves as a basis through which authoritarianism can be combated. Finally, efforts may be made to improve communications within workgroups. As occurs at the organisational level, such changes can be either employer or employee produced.

In recent times, and in a clear break with the industrial safety and health paradigm, legislators in some countries have sponsored 'right to refuse work' legislation thereby attempting to give workers adequate support to eradicate those cases of accidents and illness produced by authoritarianism. A Canadian study related that unionised workers used "right to refuse dangerous work" laws more than twice as frequently as their non-unionised

colleagues.[32] In other words, the non-unionised personnel work with and do not protest about dangers that their unionised colleagues refuse to tolerate.

The rewards level

It is common in management literature to see reference to two completely different motivational techniques, the stick and the carrot. When one does not result in desired behaviour it is suggested recourse can be made to the other in order to guarantee work. When employees are aware of the hazards of their work, incentives of diverse kinds may be used to induce performance.

Work is produced at the rewards level through the workers accepting offers of recompense, be these monetary or symbolic, in return for greater effort, such effort can be obtained through intensification of work (as in piece payments) or through its extension (as in overtime work).

The rewards level is seen as producing hazardous work through three social relations: financial incentives, extended work and symbolic recompense. No single one of these constitutes by itself a social relation capable of producing ill health and accidents and the effects of each may be differentiated by worksite or by sector. Social relations must be adequately conceptualised in order that hypotheses be formulated relating to their roles in the production of accidents and illness.

People may or may not decide to work harder in order to earn incentives offered in return for effort. When workers expose themselves to greater hazards in order to earn financial incentives it can be hypothesised that the probability rises, other things being equal, of their being subject to illness and/or accidents. One particularly clear example is provided by the offering of 'danger' and 'dirt money' payments. Another is that when paid on a piece rate bases those working at routine jobs associated with the production of RSI may substantially increase work rhythms thereby aggravating their ailment.

Work can be extended in return for payment. When this occurs we are talking of a social relation that is different from financial incentives which aim to intensify work performance and, in the case under examination, promote a more intense relationship between workers and the hazards of their jobs. Subject to extended work people labour for long hours or outreach their physical capacities. The results are well documented, physical exhaustion, accidents because of fatigue or over-exposure to noxious substances.

When workers' relationships to work are managed by symbolic rewards compensation for effort is not material, rather, esteem, status, and prestige are among the incentives used to produce orientations favourable to increased work either through its intensification or its extension. The use of symbolic rewards is extensively discussed in management literature. In this way, for example, work in a hazardous environment may be carried out solely by those who, for psychological or social reasons, value their contact with such an environment.

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[32] Renaud, M. and Saint-Jacques, C. 1986. Le droit de refus, cinq ans après: l'évolution d'un nouveau mode d'expression des risques. Sociologie et Sociétés. vol. 18, no. 2, pp. 99-112.

This cursory examination of the rewards level allows us to perceive that peoples' relationships to the hazards of their jobs may be managed entirely at the rewards level. However, as at the other levels observed, both workers and managers (who act as the agents of employers) can attempt to limit the effects of this level on the production of illness and accidents.

The individual member level

This level refers to that part of the worker which is not organised, commanded or rewarded. It is made up of the autonomy that remains to workers after the operation of the systems of social relations which seek to structure their actions.

At this level accidents and illness are not produced in a manner that is capable of being analysed sociologically. Rather, they are produced when workers act with the context of the hazards of their jobs in manners that are autonomous from the systems of social relations. Staff selection programs, incentives, rules, and work routinisation constitute some of the managerial practices designed to limit the space for behaviour at this level.

Conclusion

This theory has been elaborated so as to permit science, technique and administrative measures, whatever the cultural and political contexts in which they are elaborated and applied, to be examined through concentrating on their roles in the production of various phenomena in workplaces, and among them safety and health.

Knowledge acquired in the natural sciences is integrated through technologies and diagnoses into the social world, a theory such as that outlined in this paper permits the researcher to clarify the terms upon which such integration takes place and to trace the consequences of different strategies of integration. Limitations inherent to the process of production of knowledge in the natural sciences and in the solutions applied by engineering, medicine and ergonomics are analysed by some through explicit reference to social processes. Through paying close attention to these two these two types of social analysis the grounds for developing a new approach to safety and health at work can be located.

The sociological theory outlined permits the analysis of the interventions of professionals and administrators in terms of their effects on the ways in which people manage their relationships to the hazards of their work. As such it should be able to introduce a stimulus to reflexive thinking on the part of these actors, inviting them to evaluate the underlying knowledge about, motivations for, and consequences of their actions. Such consequences are never given from the outset but, rather, depend on how actions articulate within systems of social relations in the workplace. The integration of a diversity of themes is possible because the theory, as elaborated at the micro level, places worker knowledge and motivations for actions at its centre and because it is firmly anchored in a disciplinary and theoretical tradition which has made a long contribution to developing understandings of work even though it has little tradition in the area of safety and health.

Conclusion -
Implications of the Sociological Theory for Safety and Health Research

First, it is important to recapitulate a few principles. In the same workplace different groups of workers can have their relationships to their work managed on a routine basis by different sets of social relations.

The key theoretical proposition being advanced in this part of the paper is that the production of ill health and accidents in a given workplace is inextricably related to the social relations used to manage the relationships between workers and the various hazards of their jobs. Changes in social relations are linked to changes in the production of such effects.

Acting within such a theoretical perspective a researcher must seek to establish the ways in which people come to work with hazards. Where such hazards are known to workers the researcher must seek to identify the motivations that lead people to work with them. In other words, investigation is to be carried out into the understandings that people have of their workplaces and the sense which they give to their actions.[33] In field studies a series of questions arise, among them: are certain known hazards treated as a normal part of the job (voluntary servitude), do workers execute tasks involving hazards because they fear punishment should they refuse (authoritarianism), or do they work with such hazards because they see themselves as being rewarded for such action (financial incentives or symbolic rewards)?

From one workgroup to another, from one workplace to another, responses to such questions will differ. A research sociologist will seek to build up valid explanations of differing patterns of accident and illness causation.[34] To be considered valid, explanations must exhibit causal and meaning adequacy,[35] in other words, statistical (causal) relationships must be established between the existence of patterns of social relations and exposure to hazards, the explanation established must be meaningful to the workers involved. For example, should a statistical relationship be established between financial incentives and accidents such an explanation can be considered valid only if workers are shown to be motivated to work more dangerously in order to earn the incentives offered. Within this type of sociological analysis preventive strategies are adopted subsequent to consideration of the relationship established between different social relations and the production of accidents and illness at work.

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33 A pioneering and influential although pre-theoretical book in is Nelkin, D. and Brown, M. 1984. Workers at Risk: Voices from the workplace.Chicago, Chicago University Press.

34 The literature suggests that there are great problems in arriving at estimates of accident and illness rates for certain categories of worker, take, for example, temporary workers. Some may hide their conditions for fear of dismissal, sometimes their employing enterprise does the same. In many cases it is difficult to arrive at statistics for hours worked that are of a nature comparable to those produced for principal enterprise. Such social processes would appear to reduce the number of reported accidents and illnesses and make the calculation of rates difficult. These questions constitute an important challenge to researchers. Certain illness, especially those with long latency periods, are even more complex to treat.

35 For an understanding of this see: Schutz, A. 1967. The Phenomenology of the Social World. Evanston, IL, Northwestern University Press. pp.215-250.

Afterword

Moving towards monitoring

The prescriptions built up in this paper probably appear to be overly focused on the micro level and on workers and workplaces to be of use in developing monitoring programmes. At the present point in time case studies of workplaces constitute the only method that appears viable in the building up of such understandings. Thus, comparative studies can be conducted within the matrice of the sociological theory outlined on such important themes suggested in this paper, for example, the consequences of the insertion of design principles mooted by Sheridan or de Greene versus traditional principles, the effects of the articulation of the patient's view into a diagnostic processes compared with traditional views and comparisons of ergonomic interventions carried out under participative and traditional approaches.

Historically new theories have frequently required the development of instruments to permit their testing and the subsequent development of applications. Copernicus' theory of the earth's heliocentric orbit was only able to be confirmed from the moment that a product of the technical revolution, the telescope, was available for use. Present techniques used to monitor and predict industrial health and safety are predominantly products of the industrial paradigm. As such they appear like fishing nets ill-adapted to the demands of new seas. Theory, analysis, monitoring and eventually prevention will only be able to advance if researchers, to use Karl Weick's words, "drop their tools" - "organisational researchers" he suggests "are in a... threatened position to that of fire-fighters (caught in the middle of a brush fire) and face a similar imperative to drop their heavy tools or they will be overrun. To drop one's tools is simultaneously to accept mutation and to modernise remembered values or to believe the past as well as doubt it."[36] The challenge is to build monitoring techniques that depart from a new and basic question- what social relations lead people to work systematically with hazards and what social processes sustain such activity?

A first practical consequence of this paper is contained in the suggestion that the categories of cause used herein be employed in the processes of investigation of accidents and industrially produced illness. Thus, the knowledge and motivations of human beings who suffer the consequences of the hazards would be placed at the centre of investigation and prevention efforts. In this way the proposed analysis would break radically with the industrial approach which, referring to 'unsafe acts' and 'lack of personal hygiene', excluded reference to workers, their knowledge and their motivations in explaining the production of their misfortune.

The social processes that sustain hazardous work are not, as was illustrated with reference to silicosis in the United States, only given at the micro level of the workplace. They are also produced at the institutional and macro levels. Sociology as an analytical discipline can elucidate the processes by which hazards come to be produced, come to be known about and come to be questioned. In so doing it renders society more transparent to its members. Once hazards are known about and understood widely they can become subject of research, policy development and contest.

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36 Weick, K. E. 1996. Drop Your Tools: An Allegory for Organizational Studies. Administrative Science Quarterly. vol. 41, pp. 301-313. explanation in brackets is my own.

The sociological approach outlined also seeks to make actors, and this is particularly relevant at the institutional level, aware of their responsibilities for their own actions. For this to occur, professionals and state administrators must necessarily develop reflexive thinking about their own actions, seeing these as produced by social relations. The understanding of the evolution and spread of such thinking and its capacity to transform practices is of particular importance.

Finally, at the macro level a new orientation has been observed, one that breaks with the monopoly accorded to scientists, whereby a conscious public is to become involved in decision making about themes involving risk. Here, indeed, is a phenomenon worthy of major attention. It too appears to constitute a further sign of the erosion of the industrial paradigm and to serve as a possible indicator of the new.