

SOCIAL CHANGE AND TECHNOLOGY IN EUROPE

INFORMATION BULLETIN Nr 6

Current events in
Federal Republic of Germany, France,
Italy, Belgium and the United Kingdom

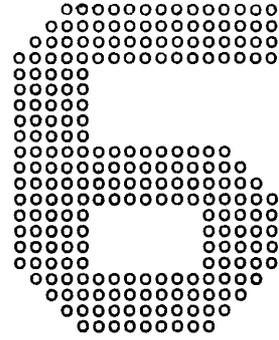
May 1982.

2nd Edition: November 1982
Reprint only

COMMISSION
OF THE
EUROPEAN COMMUNITIES

Directorate-General
Employment, Social Affairs
and Education

V/A/2-E



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This study was realised by the Commission of the European Community as part of its "Programmes of Research". The analysis and the results presented do not commit the Commission. Informations concerning this study can be obtained at: DG V/A/2 - Mr. Bernard HELIN - Building Archimède 1 - 7th floor, room 19 - tel. 235.78.95.

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WHAT IS THE E.P.O.S. ?

The Permanent Employment Committee was in favour of the Commission's proposal to set up an European Pool of Studies and Analyses (E.P.O.S.) in the field of new information technology and employment.

The Pool has three main functions :

- to collect and evaluate completed research and significant developments at national level;
- to compare and circulate the results of such research and developments, by making summaries available to those who take part in political and scientific debates, in particular employers and trade unions;
- to play a more directional role, in future, vis a vis factual studies and analyses.

At the moment, the Pool is essentially working on the preparation of a data bank, on annotated bibliographies, surveys and on the current bulletin.

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INTRODUCTION

The sixth issue of "Social and technological change in Europe" is a continuation of the fourth issue. It is an updating and is at the same time more detailed.

After a fifth issue devoted to a survey of the literature on the topic "The employment of women and new technologies", this bulletin gathers together new contributions of national correspondents from the European Pool of Studies. Five countries are presented in a fairly homogeneous way. The specifically national situations lead to a heterogeneity being maintained as regards the contributions.

- The comparative report of the Federal Republic of Germany covers the period from December 1981 to April 1982. It deals principally with the debate on the public programme concerning the humanization of the work-environment.

- The Italian report updates the text of December 1981. It gives more extensive informations and more precisely describes the actions of the Unions and of the political parties.

- The French text once again owes its specific nature to the recent reorganization of the national policy. It deals with the new elements of a new social policy of computerization. In this way, the structures are progressively laid down, especially in the area of research.

- The contributions of Mr. BLANPAIN basically deals with the proposals of the Belgian government in the area which concerns us and with the attitude of the social partners upon the new technologies.

- The report concerning the United Kingdom systematically updates with the same scheme the previous text of December 1981. It illustrates the debate which was begun during the start of this "Year of New Technologies" and presents certain experiences in specific sectors.

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May 1982

0 Summary

The following third report gives a survey of the activities and publications from December 1981 to April 1982.

In the first part the activities of the government are described. The public promotion of microelectronics is realized by a special programme concerning the application of microelectronics. Furthermore, a special programme for the improvement of information technology in the field of picture and tone detection has been promoted. Thus the essential foundations for the further automation of production are laid.

Lately the public programme "Humanization of the Working Environment" has more frequently been criticized. A steering committee (consisting of scientists and representatives of the unions and the employers), which advises the Ministry of Research and Technology, has given recommendations concerning the future activities. The responsible committee of the German Bundestag has organized a hearing with experts about the situation in the humanization promotion. The transfer of technology - especially the diffusion of microelectronics - has been supported by the government since 1977. An investigation on the public activities hitherto performed is summed up in the following.

The unions have discussed the social effects of microelectronics in depth. Facing a high unemployment rate and prognoses about the social effects of microelectronics the unions are challenged to more activities. The publication of a study by the Club of Rome forecasting the effects of the microelectronic revolution has reinforced the discussion. Besides this, the question of protection of workers from accidents and job injuries is now as before of great importance. Therefore the unions demand a new labour safety bill. The government's programme "Humanization of the Working Environment" is now as ever supported by the unions, although this is accompanied by criticism in detail.

Important subjects of discussion for the employers are the international competition and the increasing practical importance of microelectronics. The Hannover Industry Fair has shown the significant importance of microelectronics. Rapid changes have to be noted in the machine building industry.

Research in the field of effects of technical development concentrates in more detail. An example of this is the investigation on the effects of automation in text processing. Here it becomes increasingly evident that the social effects of technical change attract more attention.

1. Government Activities

1.1 Promotion of Research and Development

On 2nd December 1981 the Federal Minister of Research Andreas von Bülow pointed out the lack of a strategy supported by the industry, the unions and the government to solve the structural problems of the 1980ies and 90ies to the Federal Board of German Trade Union Congress (DGB) in Bonn.

The Minister stated, that the key-technologies which would radiate on the whole industrial structure and would considerably affect the structural change, should be developed in a consequent strategy of modernization for industrial application.

In the opinion of the Federal Minister of Research it is necessary to transpose scientific knowledge and new technology into the economy and the world market as quickly as possible.

With the decision to promote product innovations (from 1982 onwards in a special programme microelectronics) in which microelectronics are functionally determinative, the research and development policy of the Federal Government would have made a further considerable contribution in this direction. The numerous possibilities of application of these key technologies would also imply risks of unemployment.

These would increase, however, the more the competitiveness of the Federal Republic would decrease in future.

It would now be important, to make sure concertededly, that other countries could not divide up the newly developing international markets amongst themselves.

(From : Federal Ministry of Research and Technology - Information Nr. 1, 1982, page 1).

The application of information technologies in order to lower energy consumption is gaining importance in the public discussion. So far it is worth noting, that in November 1981 the Federal Minister of Research and Technology presented in a discussion the results of a study dealing with microelectronics and energy saving done by the Fraunhofer-Institute for solar energy in Freiburg.

Amongst the numerous possibilities to low energy consumption through the use of microelectronics the field of room heat showed great potential.

By means of microelectronics energy saving and suitable steering and controlling mechanisms as well as consumer-friendly information systems can be developed in this field. The study identifies still existing gaps as regards the technical conditions to exhaust the estimated energy saving potentials, for example the lack of appropriate sensors for the recording of temperature, to meet the daily requirement.

It also became clear that microelectronics have to be part of technical solutions in the field of energy saving. (From : Federal Ministry of Research and Technology - Information Nà. 1, 1982, page 6).

In the field of information technology the research and development projects concerning recognition and processing of patterns are promoted in 1982 :

- development of new procedures for the recognition of patterns with regard to model information and background knowledge
- recognition of pictures
especially development of effective recognition of algorithms for the evaluation of picture contents and series of pictures, demonstration projects of picture processing, development of efficient instruments for picture processing (i.e. special processors and programme).
- recognition of speech
development of systems for the recognition of continuous speech.

A participation of 50% of the costs is demanded if the request comes from private enterprises.

(from : Federal Ministry of Research and Technology
Information 3/82)

1.2 Humanization of the Working Environment

The committee "Humanization of the Working Environment", which advises the Minister of Research and Technology, has concerned itself in three sessions with various aspects of the development of the action programme in the competence of the Ministry of Research and Technology. On 16th February, 1982 it presented assessments, proposals and recommendations to the Federal Minister, interested experts and the public.

Total Assessment

The programme "Research on the Humanization of the Working Environment", which was put forward by both the Federal Minister of 'Labour and Social Order' and 'Research and Technology' in 1974, has stood the test as a framework of reference with a description of scopes and formation of problems and needs no modification.

The committee regards the tasks outlined in the programme not as limited but as permanent ones. These are to be adapted to technological, organizational, economic and social changes via an appropriate choice of crucial points and types of intention. Especially under the dominant economic conditions and those likely (to influence the competitiveness of the German economy, accompanied by long-term unemployment on a high level, but also in order to master the difficulty to engage unattractive jobs) the programme is of central importance. In a phase of social political frictions due to the economic situation the humanization of working environment has an important function. Last but not least, impulses on the markets via the creation of humane products and processes given by the programme have to be regarded as a useful contribution. Therefore a stagnation or even further restriction of the Federal funds available for this programme, would hinder and endanger the necessary fixation of focal points.

This estimation of the committee is also supported by the fact that the programme increasingly received international attention.

As concerns the initial situation

Between 1974 and the end of 1981 the Federal Ministry of Research and Technology granted about DM 650 mio for projects of the Humanization programme :

- DM 391,3 mio for 481 projects to improve the safety of working places and to reduce stress and strain
- DM 170,6 mio for 211 projects to create better possibilities of development and qualification
- DM 63,3 mio for 103 projects to realize and spread labour-scientific knowledge already gained
- DM 26,0 mio for 61 projects for overlapping application-oriented research and miscellaneous.

This also documents the present concentration of the fund distribution.

Most important recommendations :

The following points have been confirmed, which have to be taken into consideration in future plannings :

- projects with technical-organizational total solutions are often estimated differently with regard to their outcome. The unions partly miss important and expected effects of humanization, mainly because it seems to them that qualifications and latitudes of action of the employees concerned, are not at all or only insufficiently improved. The transmission of gained acknowledgements and experiences faces various difficulties.
- In case of stress, psychic, psycho-social as well as combined strains and the requirements resulting from these, still plenty of information is missing, which is necessary for human work training.

- The labour-organizational projects proved susceptible to conflicts. Often contrary opinions between shop committee and the unions on one hand and management and employers' associations on the other concerning questions of payment and co-determination were placed in the foreground. Also the optimum level of change to be strived for concerning the qualifications and the latitudes of decision was frequently discussed. The validity of the labour-organizational projects was sometimes weakened by alterations in the economic situation of the plant involved.
- The programme "Humanization of the Working Environment" has to be seen in connection with the other areas of technology promotion. As to the solution of content and institutional problems diverse conceptions exist as much as ever.

In the further development and realization of the programme the socio-economic aspects should play a significantly stronger role than hitherto. In projects to improve labour-safety and labour-quality and to reduce stress the following should be considered respectively

- the individual costs (both in a socio-economic meaning and referred to the humane criteria listed in the following)
- economical aspects of single plants, if occasion arises by use of suitable methods of calculation and decision
- national economic and social costs.

Criteria of such a catalogue should refer to for example :

- continuance of the labour contract
- stress, strain, health safety
- work contents, qualification, personality

- payment and required work results
- direction, communication, cooperation
- partition, representation

estimation of micro-economic effects

- change of existing cost with reference to the original situation (especially costs of investment and personnel)
- qualitative and quantitative retroactions of possible projects on the whole plant organization
- effects on the behaviour of decision making of the management in non-monetary questions

national economic and social costs

- effects on contributions and payments of the social security system, especially pensions and insurance concerning professional accidents
- effects on the sections of the labour market concerned
- other possible national economic effects.

(From : Federal Ministry of Research and Technology
Information 3/82)

1.3 Transfer of Technology

In order to support medium-sized business in mastering structural and technical change, the BMFT has promoted a series of model projects since 1977. The aim of the in all 15 projects with 19 advisory boards in 16 towns was to make medium and small scale enterprises familiar with the use of progressive technologies and to stimulate the market for such advisory services.

In order to acquire large experience in this quite new field, different methods of consultation have been tested :

Regional advisory boards, working in all branches of industry - being mainly institutions of the chamber of commerce and of the Board of Curators for rationalization of the German industry; some of them were equipped with separate technical advisers, while others referred to independent technical advisers exclusively.

Branch orientated advisory boards - for example in the field of engine building or iron, steel and metal manufacturing industry and also in steel processing working supra-regionally.

Advisory institutions concerned with technology, like the VDI-technology centre in Berlin, working specially in the technical fields of microelectronics and physical technologies - working supra-regionally too.

Since 1979 an employer orientated model of technology advise is being promoted, aiming mainly at union stewards, shop stewards and employers. It is being tested in Hamburg and Berlin and limited to the particularly interesting engine building branch.

For these projects 17 mio DM have been provided by the Federal Ministry of Research and Technology by the end of 1981.

An interim report which has submitted now shows that these experiments have been very successful. This can be observed from the fact, that the enterprises have a tremendous demand for the provided advisory services :

- a total of 3450 consultations were carried out in about 2300 enterprises
- 2100 of them by experts employed by the advisory boards - these were mainly short consultations with a scope of 1 to 3 days' work - and
- 950 short-consultations and
- 400 so-called "intensive consultations" with a scope of 10 to 20 day's work carried out by independent technology experts, who were procured for the enterprises by advisory boards.

In these cases the consultations covered a large spectrum of problems :

introduction of new production techniques, incorporation of new technology-intensive products of the enterprise; mediation of cooperation with research institutes, organisation of research and development in the enterprise; provision of special information from data banks, but also consultation about financial abilities of risky technological developments by different governmental promotion programmes - a difficult field especially for smaller enterprises.

A high percentage of the enterprises - about 65% - consulted a special external adviser for the first time due to this promotion and so started the dialogue with independent expert knowledge. It was ascertained that many of these contacts remain even without further promotion. A conclusion might be made that the value of external know-how for the competitive ability especially of smaller enterprises has been recognized.

(From : Federal Ministry of Research and Technology
Information 2/82)

2. Trade Unions

The German trade unions took the publication of the "Club of Rome" on the consequences of microelectronics as an occasion to stress the dangers and risks of information technologies. Thus, for example, the two biggest unions (the metal workers union and the union for those employed in public services and transport) chose "microelectronics" as the main issue for their magazines. The titles are : "Chances and risks of microelectronics" and "microelectronics - way to the abyss or gate to paradise".

The minister of research and technology, von Bülow, exposed in an interview with the magazine of the metal workers union :

"Technology policy is able to contribute to the solution of employment problems in the long run by investing more money than in former times in fields leading towards new products which can be exported or create new markets in our own country, for example, the special programme "Application of microelectronics", in which the innovation of products, whose function is dominated by microelectronics, is promoted. In this way, new and, as I hope also safe jobs are created.

The reduction of unemployment by the creation of new jobs is very urgent. In the field of microelectronics I see three central tasks.

First, we have to control this technology in our country in order to change from an import country to an export country. Secondly, we need production innovation in order to use the chance of microelectronics for new jobs. Otherwise we cede the chances to others and only take over the risks of the loss of jobs, as we can observe in the watch and clock-making industry, entertainment electronics or business machine industry.

Thirdly, we have to contribute to the creation of jobs in fields which are socially useful by a progressive policy concerning the humanization of working life, environmental protection, saving of energy and technical communication. A strategy to shape technical change with regard to social responsibility and to bear it economically has to be developed and supported by all social groups in our country. I expect that the social democracy as well as the trade-unions will give a prominent contribution with good ideas.

The German Federation of trade unions demands new protective labour legislation.

For the unions the protective labour legislation is an absolutely necessary step towards healthy and humane working conditions. In the unions' view the most important points of the bill are :

- protection of health :

The aim of protection of health has to be formulated extensively. It must include protection of working power, humane work training and the possibility of vocational training.

- scope :

The scope of the law has to be kept as wide as possible. Especially public service, mining and shipping must be included.

- Working time :

The employee must have the right to refuse work if he presumes it will endanger his life or his health. A right to information and complaint must be granted.

- cooperation with trade unions :

The trade unions should have the right to recommend persons who are as officials of the trade inspection office responsible for cooperation with the unions.

(From : WSI-Informationdienst, 1/1982)

German Trade Union Congress (DGB) :

"Humanization Programme is an important contribution to improve the working conditions :

The research programme "Humanization of the Working Environment" which has been promoted by the Federal Minister of Research and Technology at the cost of DM 680 mio since 1974, will also in future energetically be supported by the DGB.

This became obvious in a hearing in front of the Committee of the Bundestag for Research and Technology on 3rd March 1982, in which representatives of the industry and the unions and independent scientists commented on the up to date results and the future of the humanization programme.

It was underlined by the trade unions that in the past the programme has been a contribution to stimulate the general discussion concerning the formation of the labour conditions; it has also given impulse to the sciences to pick up questions of labour conditions more than in the past (with regard to the contents) and to handle them in research and trading. As to the unions both in the field of strain reduction and in tests of new forms of labour organization significant acknowledgements of beyond plant level importance have been gained.

It was also underlined that in some projects more education and further education of low qualified employees have been the main points. The participation of those concerned and their representatives within the humanization programme and above all in plant-level projects was represented as the essential unions' claim, which should be met in the remaining areas of public promotion of research and technology. For the future development of the humanization programme the following focal points were denominated :

- work contents, which allow a qualified and largely self-determined work
- educational and further educational measures for low qualified workers

- reduction of health damaging psycho-nervous strains
- reduction of multiple strains
- social costs through illnesses and accidents due to work and early disability as factors to estimate the economy of humanization measures.

The committee 'Humanization of the Working Environment', which advises the Ministry of Research evaluated the up to now development of the research programme positively despite all the criticisms in detail.

It mainly pointed out the success in the area of labour/safety and reduction of strains at working places. It is noteworthy, that the statement referring to this was unanimously approved, i.e. also by the employers' representatives

(From : *WSI, Information Service for the Humanization of Humanization of the Working Environment)

(WSI = Economy and Social Scientific Institute of the Federation of Labour)

3. Employers

The big industrial fair in Hannover which takes place every year in April was dominated by the application of microelectronics. A German newspaper reports :

"Rationalization and automatization are not restricted to electronic control of machines. Nowadays they are to inform the quality control of the execution of a process or the results of measurements and to accept orders from the head office. So an extensive network emerges in which information and control impulses derived from it circulate. It does not only provide a smooth run of production operations and the most favourable flow of material and workpieces through the plant but also guarantees highest possible quality and reliability at a minimum price.

The fusion of data and text processing, of office and production is leading towards completely new types of enterprises, the integrated factory of tomorrow. This was regarded as so important by the SIEMENS concern that a member of the board of directors was sent to Hannover, especially in order to present this factory. At the same time entertainment electronics penetrate the administrations. Companies like GRUNDIG, usually known as television manufacturers, offered picture screen text systems for internal communication. These systems do not only allow the companies to tap their own but also foreign computers and data banks via telephone network. GRUNDIG and SIEMENS had at the same time presented themselves as offerers of stereo television techniques applying to the daily routine of a factory : They allow remote-controlled handling of dangerous substances from any distance. BBC offered industrial robots being "able to see" which can not only seize and transport but also set down in a deliberate array. In this case the "eye" of the robot is a television camera again.

With that technical spheres merge which have been strictly separated up to now".

(From : Frankfurter Rundschau, 30th April 1982)

The application of Microelectronics in Engine Building

The tendency to apply microelectronics in engine building is rising rapidly. While an investigation in 1979 worked out that 5,3% of the devices, machines and plants produced and applied in German engine building had been equipped with microelectronics, this figure moved up to about 12% in 1981. At present the main fields of application are data gathering, optimization and control and adjustment facilities. Microelectronics do not necessarily replace traditional technologies but supply them in many cases in order to create progressive techniques.

The common trend concerning the application of microelectronics towards increasing automation of the production process. The maintenance of flexibility as well with regard to the field of application as to the possibility of readjustment is dominating the efforts. Microelectronical multi-processor control systems, process supervision facilities and integrated handling systems represent the hardware basis of this development characterized by the term "flexible manufacturing units". The intelligent and workshop-adjusted software systems for programming of workpieces, machine control and process supervision are leading towards an essential relief for the operators and release them from the machine's working tact. By the application of television monitors their presence at the machines should be necessary only from time to time in the future. The use of the working time being released can happen as well by delegation of workpiece programming to the shopmen as by increased multi-machine operation. A calculation of profitability pursued under these assumptions showed that considerable reductions of unit costs can be obtained.

(From : Industrieanzeiger, Nr. 7, 22.1.9182, page 23)

4. Research

The RKW - the German productivity centre - published an investigation on text processing at the beginning of 1982 :

Lately text processing as an instrument of rationalization in offices and administration is gaining more and more importance. The new RKW-study investigates the consequences of the application of this technology containing 10 case studies in enterprises from industry, trade, banks, assurances and public administration.

The following main issues are treated in this study :

- obstacles for innovation like acceptance, organization and decision barriers
- effects on productivity connected with the application of text processing systems
- problems of application in medium and small scale enterprises
- dismissal, dislocation and relief of workers
- modification in working conditions, in stress and strain occurring due to the reorganization from conventional methods of work to electronical text processing
- strategies of the shop committees

(From : RKW - Menschen im Betrieb, March, 1982)

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May 1982

INTRODUCTION

The present document updates the appraisal, outlined in our previous report (December 1981) of the state of information and action in Italy on the implications of new (microelectronic/information) technologies. This report covers mainly the period December 1981 - April 1982.

Although one cannot expect major changes in the general situation in this lapse of time, it must be acknowledged that there is a growing concern and debate among political and trade-union operators on the argument. The general worsening of employment prospects (the global figures for 1981, now available, show a 2% decline in industrial employment, which does not include some 400.000 workers whose state of effective unemployment is being disguised by the peculiarities of the Italian "Cassa Integrazione" system) and the deterioration of the state of industrial relations, in connection with the opening skirmishes of the nation-wide contractual rounds of the year involving more than 70% of the industrial workers and some important service sectors (e.g, Banking), have contributed to determining a growing attention towards the employment implications of technological change. In connection with the definition of the platforms for the contractual rounds, there has been a renewal of controversies on the effectiveness of working time reductions as a way of countering trends in labour saving; the parliamentary discussions on the reform of Labour Legislation (concerning arguments such as unemployment compensation, workers' mobility, the revision of the system of Agencies dealing with labour market policies), have entered a more operational phase, with the major parties issuing important policy documents; there has also been some relevant activity at the level of specialists' seminars and a greater specialized and general press coverage.

For some recent statements, official reports were not yet available at the time of this writing, so that only brief

news could be given; in other cases, opinions reported represent only a summary from informal conference notes.

GOVERNMENT ACTIVITY

a) Promotion of Research and Development

On the basic research front, whose main channel of promotion and financial support by the Government are the "Finalized Projects" coordinated by CNR^{*}, there is no notice of publication of a recent report on the state of advancement of the programs within the project on Information Technologies, and there are complaints about delays in the flow of public funds. The original research programs are to be extended with the constitution of a work group on Robotics, for which a feasibility study is being implemented.

At the level of financial support for industrial research and development, the approval of the so called Law on Technological Innovation (Law n. 46 of 17/2/82) represents an important achievement: this Law assigns, for the period 1982-83, a sum up to a maximum of 1700 billion Lit. to the Funds for Applied Research in industry ("Fondi per la ricerca applicata"), under the financial management of IMI^{**}. This fund will be allocated, according to the text of the Law, to programs "finalized for the development of highly innovative technologies of strategical interest, admitting industrial applications in the medium term". A quota of 15% of the fund is to be allotted in favour of programs of "diffusion and transfer" of new technologies in small/medium sized enterprises. However there is not yet a clear agreement on the criteria of sectoral allocation of these funds, and one can foresee competition on this point among industrial and political circles. A sum of 300 bil. Lit. upon the Fund in question is now being indicatively reserved for developments in the

* Consiglio Nazionale delle Ricerche

** Istituto Mobiliare Italiano.

fields of new telecommunication technologies and services by the "National Plan for Telecommunication Services" on which more details will be given in a later section.

b) Industrial Policy

The worsening employment crisis in the industry of Electronic consumption goods has moved the Government to issue a Decree providing measures to support, and in particular, to authorize interventions in the sector by GEPI^{*}, a Public Holding specialized in "rescue-operations" of threatened firms, through financial participations and, in the case, taking-over of the management of firms in a state of financial crisis. (Decree n. 807 of 22/12/81, partially modified by the Law n. 63 of 5/3/82, concerning "interventions in the sector of electronic consumption goods and related components".)

The sector under discussion (in which the manufacturing of color T.V. sets and related components accounts for about 60%) employed some 20.000 persons in Italy. Lack of competitiveness of the national production (the share of local firms on color T.V. market fell from 36% in 1976 to less than 20% in 1981) is the main cause of the present crisis, which has been worsened by the decision of some foreign-owned subsidiaries (Grundig, Telefunken) to abandon or reduce local assembly operations. The Government intervention comes after pressures by Trade-Unions for job preservation and appears to be a typically Italian example of rescue operation through taking-over, by Public Industrial Holdings, of unprofitable firms abandoned by private operators. A more detailed plan for interventions is to be prepared within 3 months, and there is also a project for a merger (or at least, a coordination of programs) among the major surviving national firms (Zanussi Elettronica, Indesit Elettronica and Voxson). GEPI is being allocated a sum of 240 bil. Lit, for the purpose, with a time-span for interventions of 3 years. An operational company ("Ristrutturazione

* Gestione Partecipazioni Finanziarie s.p.a.

elettronica s.p.a") under the endowment of GEPI is to be created. At the end of this period, the enterprises still experiencing consistent losses should be closed.

The Trade unions, although admitting the unavoidable nature of some employment reductions, insist for a policy of rigid preservation of jobs at least for the plants situated in South Italy. This should be obtained, in the case, through the development of alternative productions.

This Law and related projects have been criticized as an example of industrial policy finalized to the preservation of the existing productions rather than to the promotion of "new" products, and it has been argued that the sums allocated could have found, at least partially, a better utilization in strategically more important fields, such as active components.

After a long period of gestation, CIPE (Ministers' Committee for Economic Policy) has approved (Decree of 24/3/82) the so-called "Piano nazionale per le telecomunicazioni" (Plan for Telecommunications) setting up investment and development strategies covering a time-span of ten years in the fields of traditional and new telecommunication media. The plan includes detailed programs on the electronization of communication systems and on the growth of support networks for data transmissions, and provides investment allocations and indications for the development of "new" services (facsimile, teletext, videotext, electronic mail). However, all the projects in these fields are described as "experimental" and no indication is given about the length of this experimental period.

There is a problem of impact of the trends in development of telecommunication services on the related manufacturing sectors (commutation devices, components). The STET holding company (under a public majority control), which is the main shareholder at the same time in the operating company for

telephone services (SIP), in the major enterprise producing commutation apparatuses (ITALTEL) and in the only national producer of integrated circuits (SGS), should provide the necessary coordination. Although the details of the projects within the STET group are not fully publicized, a net reduction of employment of some 5000 units by 1984 has been anticipated because of the abandonment of the production of mechanical commutation systems. The total job loss would have been greater, however, without the additional employment of some 3000 units which is being announced in connection with the development of new telematic productions. A new operating society (Italtel Telematica) has been set-up for this purpose, with a production unit in Santa Maria Capua Vetere (Campania).

c) Labour Legislation

The general project on the reform of Employment Services^{*} (referred as Disegno di Legge 760) has been passed at the first reading by the Chamber of Deputies and is now under discussion at the Commissions of the Senate. While there is still a widespread skepticism about a rapid approval of this elephantiac project of Law (totalling some 67 articles), there has been an agreement to authorize experimental applications of some of the measures provided in the project in specified local area. The measures refer mainly to the operation of the so-called "Mobility Lists" on a regional basis. These lists include workers made redundant because of technological transformations and sectoral reconversion processes, for which special priorities in the assignment of new jobs available within the area should be applied and retraining programs should be organized.

* The full title of the project is "Norme in materia di servizi dell'impiego, di mobilità dei lavoratori, di integrazione salariale ed effettuazione di esperimenti pilota in materia di avviamento al lavoro".

The most important application of this scheme concerns the group of workers dismissed by FIAT in the Turin area. According to the norms established, a quota of 25% of new vacancies in the industry notified by the local Employment Service should be potentially "reserved" for the workers on the list. The Regional authorities of Piedmont have also been organizing training programs, and elaborating experimental projects, still not operative, concerning temporary employment in public works and financial support to cooperatives and self-employment plans. The results are, for the moment, disappointing in the sense that a virtually blockaded labour market has not allowed any significant opportunity of alternative employment for workers on the mobility lists. Cases are however complained of workers refusing to move to a job considered of a lower standard.

The Council of Ministers, at its meeting of 19/2/82, approved a project of Law regulating Part-time work, which will be presented to the Parliament. This is the first attempt for legislative regulation in Italy of Part-time Labour, on which the Trade-Unions have traditionally maintained an explicit opposition. The lack of legislative regulation has not impeded, however the recent diffusion of Part-time work, which is now estimated to cover some 7% of total employment. On the occasion, the prevalent attitude of the Trade-Unions has been one of abandoning a prejudicial opposition, although a preference is given to flexible agreements at contractual level rather than rigid codification.

d) Education and Training Programs

While there are no significant initiatives, as far as we know, on the front of the State's education policy, developments can be reported at the level of projects and action on vocational training mainly addressed to school-leavers. A seminar concerning the state of advancement of "Progetto fasce di qualificazione" (concerning the definition of skill families and related training programs) was held

in Albano on 7/4/82, coordinated by ISFOL and with the participation of regional representatives engaged in the realization of training programs. The "skill families" should define, for some relevant activities (e.g. mechanical, office, informatics, etc.), the set of operational competences connected to three increasing levels of qualification. At the present, experimental classes for skills in information technologies have been organized in Lombardy and Puglia.

It is to be remembered that training programs in informatic skills are being organized also outside the network of official initiatives coordinated by the Regions, mainly by Catholic institutions (e.g. NAIP/ACLI, Opere Formazione Salesiane).

As an isolated example of successful initiative on the training of information system analysts at a higher level, we may mention the courses organized by CSATA^{*}, an institute constituted within the University of Bari, whose initiatives are being extended to other Southern Italian Universities. The University of Bari also includes, in its curriculum, a Degree Course in Sciences of Information.

TRADE UNIONS

The 1982 Round for the renewal of national collective work agreements falls in a moment of unprecedented concern over the state of employment prospects. The Federation of mechanical/engineering workers (FLM), whose contract is traditionally considered the trend-setter of all negotiations because of its quantitative impact, defined in February a draft of contractual Platform, which was discussed and amended at a Conference of workers' representatives at the beginning of April. The reduction of working time to $37\frac{1}{2}$ hours, to be reached before the end of the contractual period (1984) is generally considered the most important

* Consorzio Studi e Applicazioni in Tecnologie avanzate.

claim included in the platform. From the official document by FLM we may read: "the acceleration of the process of technological transformation gives an ever increasing political relevance to the question of working time, with implications on the general strategies for the transformation of Society The choice of a reduction of working time becomes therefore a moment which is essential, although not sufficient on its own, for the support of employment levels, for the setting-up of adequate strategies for industry, for a better balance between the North and the South".

Although the goal of $37\frac{1}{2}$ hours is defined as "certain and generalized", the timing and the modes of its application are being left to flexible agreements at a sub-sector or firm level, although the National agreement should define the margins of such a flexibility (e.g. limits on overtime, the distribution of holidays, the extension of part-time).

As far as the "information clauses" on innovation and investment projects of the firms are concerned (which had been included in the "first section" of the main collective agreements since the mid-seventies), the official document by FLM admits past weaknesses, by Union organization themselves, in their ability of pressing for their effective application and of processing the relevant informations, although complaining meanwhile a generally un-cooperative attitude by employers. The renegotiation of the clauses, it is said, should provide the extension of moments of consultation at sectoral and local levels. In another important statement (from the general report by E. Mattina at the CGIL-CISL-UIL General Council Meeting, Florence 2/2/82) it is affirmed that: "the margins for discussions are often irrelevant nowadays, the margins for bargaining are often inferior to those implied in the traditional "Taylorian" forms of work organization. To allow a real power of intervention, the information should apply well in advance of the final definition of the projects".

The claim for a more extensive application of the information clauses is also underlined in another contractual platform, concerning Banking and Insurance workers. Here it is explicitly stated that on the introduction of technological innovation the information should be available to the Unions in a preliminary phase, before any definitive decision on final implementation is taken.

The Printing workers, whose collective agreement is also due for renewal in the present year, have already entered a phase of industrial action. In the past three years, notwithstanding the "protection clauses" included in the work contract which prohibited the final inputation of texts by journalists, it is estimated that productivity per operative worker in the sector has increased of 30% with consequent job losses. On the occasion of the first issue of a new newspaper in Rome ("Il Globo") unofficial strikes hit all the printing shops of other Roman newspapers, since it was known that the management of the new newspaper was not fully respecting the established criteria of job demarcation.

Beyond the statements and actions connected with the renewal of national collective agreements, we may report further initiatives, by Union organizations at a central and local level, connected with research promotion and awareness activities on the implications of new technologies.

A Conference on "Organizzazione del lavoro e contrattazione" (Work Organization and Bargaining), organized by IRES (CGIL's Research Unit), was held in Rome on 18/19 February. The opening report of the Conference^{*} is an interesting moment of internal reflection on the implications of the diffusion of information processing and control technologies on the possibility of workers bargaining the conditions of work at

* by M. Rollier and E. Vazzoler (IRES-CGIL).

shop-floor level, and on the consequent strategies of interventions on work-organization pursued by the Unions, especially since the beginning of the seventies.

CEDOS, an unit constituted within the CGIL-CISL-UIL Federation of Milan, organized, in Summer 1981, a course on "I processi di informatizzazione del lavoro impiegatizio" (Informatic processes in office work), which is expected to be repeated in the present year. The purpose of the course is one of providing an essential "alphabet of informatics" for selected groups of workers.

The workers' coordination committee among IBM affiliates in Italy held a meeting with the attendance of national officials of FLM. A proposal was launched, on that occasion, to set-up an informal structure ("Informatica democratica") which should represent a moment of coordination of workers, trade-unionists and experts directly concerned with the application of information technologies.

EMPLOYERS

No initiatives or statement specifically concerning information technologies by employers' organizations can be reported at the moment. It should be noted, however, that Employers assume a rather firm attitude on the subject of the renewal of the national work contracts, asking for a preliminary agreement at a centralized and political level on the global measure of the increase in the cost of labour, before they will accept sectoral bargaining on any point in discussion, including that of the reduction of working time.

OTHER ORGANIZATIONS

In the following section, a brief report will be made on the state of awareness and activity within the major Italian political parties, on the implication of new technologies

and on the related labour policy topics.

Although leading politicians more frequently mention and acknowledge the strategic importance of the topic, a permanent initiative on technological policy and analytical documents produced by the official parties' bodies have been so far rather scarce. On the occasion of the compilation of the so-called "sectoral plan for electronics" in 1978 the major parties had set up commissions of experts for consultation on the subject. The Christian Democrat Party (DC), for example, had organized an "ufficio elettronica" within its Economic Policy group, which does not seem to have developed relevant activity after that occasion. However, a very recent conference on the Policy for Electronics, held in Milan on 26/4/82, with the attendance of three DC Ministers of State, represents an important moment of a renewal of initiative in this field. Although an official report of the Conference is not yet available, from the comments on newspapers it must be acknowledged that DC has shown a strong intention to establish a closer contact with the operators in the sector. Top executives of the leading electronic companies (e.g. C. De Benedetti of Olivetti, M. Bellisario of Italtel) have attended the Conference.

A group of academic and professional experts on Electronics has been active within the economic policy section of the Italian Socialist Party (PSI). The official report for the recent conference on "Obbiettivo occupazione: la proposta di politica economica e sociale del PSI" (Employment targets: the proposal for an economic and social policy of PSI), held in Rome on 7/12/81, by F. Forte, coordinator of the economic office of the party, includes a paragraph of the applicative problems of electronic technologies. A series of public discussions on the "Informatization of Society" are being organized by the "Club Turati" in Turin.

On a more general framework of proposals for alternative

policies for employment, the project of an "Agency for Labour" (Agenzia del Lavoro) initially advanced by the working group "Associazione per il programma socialista" (Association for a Socialist Programme) should be mentioned. The "Agency for Labour" should centralize all the fragmented structures of Active Labour Policy and Unemployment Compensation schemes, becoming a sort of "Employer of last resort" for all those who cannot find an occupation in the "market" sector. A differentiated income should be guaranteed to all persons taken in charge by the Agency, but the Agency itself should provide training and temporary employment schemes, avoiding as far as possible long periods of inactivity. The Agency should be financed, finally, through the centralization of all financial resources now going directly or indirectly to unemployment compensation, with the addition, in the case, of further duties (e.g. there is a proposal of a contribution of 0,5% of the wage bill to be paid by all employed workers).*

The Italian Communist Party (PCI) has advanced a project, which has many similarities with the one described, denominated "Servizio Nazionale del Lavoro" (National Employment Service). The PCI has also recently drawn an official document on proposals for economic policy ("Materiali e proposte per un programma di politica economico-sociale) in which the electronics and informatics receive the most extensive attention within the section dedicated to industrial policy. The PCI has a permanent "office for electronics" at its Central Secretariat, with regional representatives. However, at the level of parties' statements and proposals, one can still notice a de facto separation between competences on "Industrial Policy" mainly intended as policies of support and development of industrial sectors and on "Labour Policy", mainly intended as programs of employment support, although the need for a

* For a short definition of the purposes of "Agenzia del lavoro", see for example, G. Ruffolo "Lo spettro della disoccupazione", in "Repubblica" 18/11/81.

better integration between these two moments is generally acknowledged.*

SPECIALIST CONFERENCES

A two day seminar was organized by the editors of the review "Economia, istruzione e formazione professionale" (Economics, Education and Professional Training) on "Nuove tecnologie, organizzazione del lavoro e professionalità emergenti" (New Technologies, Work Organization and Emerging Professions, Olgiata 30-31/3/1982), with statements and reports by the Minister for Planning (G. La Malfa), trade unions' and firms' representatives, well-known technology experts and economists. The Conference represented a relevant occasion of synthesis and discussion on a broad range of topics connected with the social impact of new technologies with a focus on the Italian situation. A detailed summary of the themes in discussion would require a wider space than it is here allowed, and would have to wait for the publication of the reports. Recalling here only a few interventions, in order to exemplify the arguments considered, we may quote the opening report by Prof. Meo (Polytechnic of Turin), with an up-to-date description of the state of the Italian "information sector", a quantification of employment volumes and a statement of the degree of technological dependence from foreign countries; a detailed description of the introduction of new robotized systems of production at FIAT by Ing. Besusso (FIAT's Director for Work Organization); a rather pessimistic statement on the medium-term social implications by Garavini (CGIL) according to whom "a society will not be able to tolerate for a long time a rising unemployment which does not appear to be mainly due to temporary factors".

* For further details on this section, see "I politici e il calcolatore", in Zerouno, April 1982.

The Congress of ANASIN (a professional association grouping some 6000 operators in the fields of "software production") was held in Rome on 6/11/81. Although specifically oriented towards information on market trends for specialists, the Conference represented an occasion for a further knowledge, also for the non-specialist, of the realities of a growing sector. It was affirmed that the total turnover of software-oriented servicing firms was experiencing a growth rate of some 25% per year, with an employment of more than 25.000 operatives, and with the shortage of highly skilled "human resources" representing the more effective check to further expansion.

Finally, we should mention the first congress of SIRI (Società Italiana di Robotica Industriale) on "Stato attuale e prospettive della robotica in Italia" (State and perspectives of robotics in Italy), held in Milan on 4-5/3/1982, under the patronage of UCIMU, the Association of the producers of instrumental engineering products. We are not able, for the moment, to give further details on the conference; the whole topic of the developments of "robotics" in Italy should however constitute the object of a further specialized report.

SPECIALIST PUBLICATIONS

We are on the way to collecting a wider bibliography of the recent reports and statements on our topic in Italy, which will be enclosed in a further report. Here we only consider a short list of specialist journals in Electronics/informatics, whose number has recently seen a significant increase. Although they are mainly addressed to the technical operators, they often contain general information and assessments on economic and labour implications which might interest a wider audience.

- a) "Dossier Elettronica", a monthly bulletin by Reseau, constitutes an important point of reference for following the development of Public Policy decisions in electronic-related fields.

- b) "Zerouno", a monthly review by Mondadori, which has just appeared in the present year, is a sophisticated magazine mainly addressed to the general public with information on computer application.
- c) "Uomini e Computer come", published monthly by CISAD, normally contains a section on policy assessments.
- d) "L'Elettronica Oggi" and "L'Informatica" are two magazines published by Edizioni Jackson, mainly addressed to the technical operators. The same editor also publishes two bimonthly bullettins, "EDP - informatica notizie" and "EDP - telematica notizie", with short reports on market trends.
- e) "Management e informatica", published monthly, gives stress to organizational and managerial aspects connected with the application of computerized processes. In its November '81 issue, for example, one may find a note on the implications of bank automation,

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MAY 1982

I - INTRODUCTION (1)

A radical change in the approach to the social consequences of computerization occurred in France in 1982. In the last two months, new structures have gradually been set up, with the following aims :

- Reorganization of the data processing industry

The current policy aim is to concentrate the industry's forces, eliminating dead wood and establishing major nuclei around which throughout the electronics production system would be regrouped.

- Consultation

At the seminar on the electronics industry (December 1981) Mr. Abel FARNOUX announced that the time had come to hold consultations leading to coherent conclusions.

These two aims found expression in the National Research Symposium held in Paris on 13-16 January 1982. This event formed part of the ambitious plan to overcome France's weakness in research in the course of the year.

However, this was not the only Government action. The initial findings of the "mission filière électronique" are about to be published (II), and the main projects announced in the second half of 1981 are being put into effect (III).

In response to the consultations set on foot under Government policy, the two sides of industry are beginning to adopt positions on what that policy should be with regard to the SSCI (Sociétés de Services et de Conseils et Informatique) and are considering the findings of the Research Symposium (IV).

At the same time, the Government is taking steps to democratize research and give shape to its new programmes (V), while projects already under way are being continued and developed (VI).

(1) - This paper was prepared at the Centre de Recherche en Economie Industrielle (CREI) (University of Paris XIII) by Nezhir Dinbudak, Jean-Paul Jeandon, Patrice Manchion and Ugur Muldur under the guidance of Olivier Pastre.

II - RESEARCH

One of the principles of the Government's electronics policy is to develop the 'upstream stages' - that is, primarily research. This accounts for the important role of the teams organized by Jean-Pierre CHEVENEMENT, Minister for Research, and the creation of the "mission filière électronique", headed by Abel FARNOUX, which has been given the task of preparing the general guidelines.

Interim stocktaking with regard to research and technology

At the electronics seminar, Michael CHARZAT noted that the previous Government had failed to provide any real impetus in the sector. Public expenditure on research had fallen from 1.5% to 1% of GDP between 1968 and 1978. This backwardness was not uniform throughout the sector : the efforts devoted to improving working conditions in France, for example, were derisory compared with those made in other developed countries. No doubt the greatest lag was in ergonomics research. By way of comparison, a recent OECD report estimated that research on social development represented 1.5% of the total research budget in France in 1977, against 2.9% in the United States and 4.8% in the Federal Republic of Germany.

What is the Government doing in this area ? Although the structure of information technology research is solid from the quantitative (FF 1 500 million, i.e. 6% of the overall research and development budget in this area) and the qualitative points of view, it is surprisingly little orientated towards social problems.

TABLE I - NUMBERS EMPLOYED IN INFORMATION TECHNOLOGY RESEARCH IN 1980

Public research on computerization.....	1 500 PEOPLE
Research by manufacturers (less IBM).....	3 500 "
Research by IBM.....	1 500 "
Research by users.....	2 000 "
	<hr/>
	8 500 people

No provision is made in the framework of CODIS (Comité pour l'organisation et le Développement des Industries Stratégiques - Committee on the organization and development of strategic industries) nor in the ARA programme (Automatisation et Robotisation des Ateliers -Automation and robotics in industry), while the few experiments in ergonomics in data processing make it look like a poor relation. FACT (Fond d'Amélioration des Conditions de Travail - Fund for the improvement of working conditions) is contributing to the development of three ergonomically designed machine tools, and ADI (Agence pour le Développement de l'Informatique - Agency for the development of information technology) is financing some research in robotics. These experiments are rare and not well integrated into the scientific programmes of research bodies. Of course it is better than nothing. But it does not go very far to meet real needs.

Ergonomics problems are primarily standardization problems. There is little use in completing pilot schemes if they are not followed up. Mr. Pierre AUDOIN, rapporteur of the Committee on information technology and office electronics, underlined the significant losses incurred during the transition from basic and abstract research to the development of technologies and products. The pilot scheme must pass through the standardization stage prior to mass production. It is thus a key element in any development policy. In this area France lags a long way behind : compared with the Federal Republic of Germany, which defined 18 000 production standards in 1980, France has barely established half that number. While Germany has already come to an agreement on the standardization of display terminals France has done nothing.

There is also the question of determining which IT products should be standardized. As regards working conditions, much stress is placed on the design of equipment. The RESACT programme of the

DGRST (Délégation Générale à la Recherche Scientifique - Office for scientific and technical research) bears witness to this. It should be recalled that ergonomics is not a homogeneous field. The software, as much as the hardware, largely determines working conditions and organization. Three teams are working on this in France :

- at INRIA (Institut national pour la Recherche en Informatique et en Automatique - National institute for research in data-processing and automation - BISSERET team),
- at IRACT, Toulouse
- at CNAM (MONTMOLLIN team).

There are about 15 researchers in all. This shows how little ergonomics problems are taken into account when designing software.

The need for action "upstream" is quite clear if social policy as regards the introduction of information technology is to be determined. Too sharp a division between research and industry is as harmful as the lack of research.

There is a striking dispersion of efforts as regards the financing and promotion of innovation in this area (40 organizations, of which three private associations are concerned with robotics alone^o).

Some bodies would seem to be unjustly neglected. This is the case of ANVAR (Association nationale pour la Valorisation de la Recherche - National agency for the promotion of research) which allotted less than 10 % of its aids to the data processing sector (still less for the social aspects of computerization in 1980. This is also true in the case of the Centres Techniques Industriels (Industrial technology centres) which, under the Law of 22 July 1948, are funded by a para-fiscal levy on employers, calculated as a percentage of their turnover. These Centres have meagre financial resources and are largely overlooked by the business world. Of the 10 000 subscribers to the CEMM, 3 000 have never contacted it.

The new Government's policy is not bound by the options chosen by previous governments, this rethinking has led to an increase in research appropriations and the creation of a number of new bodies.

The general guidelines for an industrial policy covering electronics, information technology and telecommunications published by the Socialist Party in February 1981 give little indication as to the redeployment of activities in this sector. It was presented as a priority sector by the new Government and the amount allocated to information technology from public funds in 1982 represents a considerable increase as can be seen from the budgets of the Ministries of Research and Technology and of Industry.

Appropriations entered in civile research budget	1982 FF million	1981 FF million	1982-81 % change
TECHNOLOGICAL DEVELOPMENT PROGRAMME	658.3	368.5	+ 78.6 %
Computerisation plan (Ministry of Industry)			
of which PA	640	355	+ 80.3 %
Agence de l'Informatique (MRT)	167.5	139.5	+ 20.1 %
of which PA	132	114.4	+ 15.4 %
Sub total TDP	825.8	508.0	+ 62.2 %
INTERMINISTERIAL RESEARCH			
Agence de l'Informatique (MRT)	115	76	+ 51.3 %
of which PA	115	76	+ 51.3 %
INRIA (MRT)	156.9	113.9	+ 37.8 %
of which PA	65	41.6	
Sub-total IRB	271.9	189.9	+ 43.2 %
Total IT	1.097.7	697.9	+ 57.3 %
Total research budget	25.400	19.600	+ 29.6 %

Ministry of Industry Budget 1982 (FF million)	Programme Authorizations (PA)	Payment Appropriations	Ordinary (OE) expenditure	PA + OE
Industrial Policy	2 170	1 481	88	2 258
• Total				(+ 193 % over 1981)
• of which : development of IT industries applied technology	765	592	-	765
Technological develop- ment policy				
• Total	2 738	2 325	1 658	4 396
• of which : technical progress and develop- ment of data proces- sing and automation technology (ADI + INRIA)	187	131	127	314 (+ 46 %)

Allocations made available in the Ministry of budget, but administered since beginning of 1982 by the Ministry of Industry.

Source : 01 Informatique.

In addition to the 43.2 % increase in the inter-ministerial research budget, appropriation for technical progress and the development of data-processing and automation, to be administered by the Ministry of Industry, has been introduced.

This financial effort is accompanied by re-structuring measures the overall electronics development policy is beginning to take shape with the creation of the "Société de Développement Industriel" (SDI) (industrial development corporations - an important feature of this policy. The SDIs are an intermediate structure, examples of which may be found in Japan.

The head of the electronics industry department in the Ministry of Industry recently called attention to the first SDI, which covers the mini-computer sector. The SDIs are intended to supervise and control the expenditure of public funds while ensuring the effective application of research products in industry.

In the mini-computer sector, the nucleus for the SDIs will be formed from SEMS, CII-HB and INRIA teams (Institut National pour la Recherche en Informatique et en Automatique -National institute for research in data-processing and automation). The first SDI maybe installed in the Grenoble region and the second in Toulouse, in the framework of the new law on decentralization.

Perhaps the creation of the SDIs maybe regarded as a sign that account will now be taken of the social consequences of computerization ? At the same IT research is being restructured so that data-processing and ergonomics research centres will be grouped together.

Research will be planned and organized around certain public research centres and regional units. Thus a public research centre specializing in automation will be located in Toulouse, one in audio-visual techniques and office electronics in Rennes, one on integrated circuits in Grenoble, while the eight nationalized groups will be invited to set up one of their industrial and research centres near each of these towns.

In addition, the establishment of the World Centre for the Social Uses of Microprocessors, announced by the President of the Republic last November, has been confirmed. Work will begin in March.

This centre, set up as an association under the Law of 1901, will be headed by Mr. SERVAN SCHREIBER and will come under the Ministry of Research and Technology. At the Cabinet meeting on 27 January, Jean-Pierre CHEVENEMENT said it would constitute one of the pillars of the industrial and technological regeneration of the country.

The Centre will develop activities in three fields :

- technology leading to the development of the personal mini-computer,
- support for pilot projects on the uses of microprocessors in the third world,
- social experiments in France.

The Centre will establish relations with research workers and the main French and foreign teams. The Government hopes that the presence of these researchers will give the Centre an international dimension. The project has been given a warm welcome by French researchers, for whom it represents an important step forward in that attention will now be focussed on the social problems connected with micro-processing, somewhat neglected hitherto.

The Government and the Ministry have for the time being come to an agreement on a budget of FF 35 million for 1982. There will be no less than nine Ministers on the Centre's Board of Directors, which is an indication of the importance ascribed to this body by the Head of State.

The Ministry of Research and Technology has also announced the establishment of a Centre d'Etudes des Systèmes et Technologies Avancées (CESTA) (Centre for the study of advanced systems and technologies).

The main aim of this body is to contribute to the development and dissemination of technologies while preparing the ground for their integration into the social, economic and cultural structures of society in France. CESTA's mission will have four aspects :

- study and research,
- assistance in technological choices,
- training,
- promotion and dissemination.

CESTA will be responsible for liaison with national and regional associations created following the Research Symposium. Those are the practical sides. Thought for the time being is concentrated on two aspects :

- the Research Symposium and its follow-up,
- report by the committee 'mission filère électronique' on socio-cultural aspects, set up by the Ministry of Research and Technology.

- The Research Symposium -

On this occasion, Mr. Mitterrand said : It is a matter of urgency to undertake long-term action in certain vital sectors that we must master if the independence and competitiveness of France is to be secured in the future; for example, electronics and data-processing, which is of such importance that we unanimously agreed to set up, in Paris, a World Centre for the Social Uses of Microprocessors".

The significant point about this speech was the emphasis on the electronics sectors. Two committees have considered the social implications of computerization :

- one concluded that several independent studies should be carried out on the socio-economic impact of technological options,
- the other focussed on the socio-economic repercussions of the dissemination of this technology.

Mr. Jean-Pierre CHEVENEMENT defined what he called the French model for the organization of research and technology. This model took account of social factors in regard to research; several guidelines had been established of which some had already been given effect. The research budget would amount to FF 50 000 million in 1982 and should rise by a further FF 30 000 million at constant prices between now and 1985 - an increase of 17.8 % per year.

The French model provides for :

- a decisive rôle in research policy by public research bodies and universities;
- a pilot role in industrial research for nationalized firms;
- the development of regional research and technology nuclei in small and medium-sized undertakings (the private sector is called on to contribute to the confluence of initiatives and the flow of creativity). ANVAR will help to inform the small business sector; its role will be expanded and its budget increased (FF 760 million for 1982);
- the creation of an office attached to Parliament which will evaluate technological options;
- the establishment of an "Haut Conseil de la Recherche et de la Technologie" (high level research and technology council) attached to the Ministry of Research. It will include representatives from all circles who will be consulted on reports on the scientific and technological policy options;
- the creation at regional level of advisory committees to the "conseils généraux" (elected councils at department level);

- the creation of new research posts at the rate of 4.5 % per annum over the next few years;
- the establishment of a training policy designed to attract the younger generation to research.

The problems of financing the various technical research centres have not been forgotten. A proposal has been widely discussed : "le 1 % technologique" (1 % technology tax). Under this measure para-fiscal would be replaced by a general tax on firms equivalent to 0.3 % of their value add. This would increase the resources allocated to technical centres and research establishments. But the most original aspect of the proposal is as follows : firms in need of technical assistance can approach any public or private industrial research centre provided it has been approved and recognized for this purpose.

The Government's research policy could be said to have three main aspects - demonstration, decentralization and nationalization. For the first time, account is being taken of the social consequences of computerization.

La "mission filière électronique" (electronics task force)

The economic and socio-cultural aspects committee was given two tasks :

- to determine what was at stake, and identify the socio-cultural stresses generated by the spread of electronics technology :
- to undertake, on the basis of certain proposals, discussions leading to a definition of the main priority lines of research.

The conclusions are quite clear : it will be difficult to avoid causes of stress.

Therefore, the aim is to mitigate this stress. This could be achieved by controlling the distribution - and pace of dissemination - of the new electronic goods and services.

The Committee listed five shortcomings :

- lack of operational research (iteration),
- weakness of research on the links between design and materials; poor forms of work organization,
- weakness of time utilization analysis in France,
- lack of a centre for the evaluation of the economic and socio-cultural repercussions of the development of electronics technology,
- lack of efforts to disseminate technical know-how.

If these lacunae are to be filled, a master plan for the "computerization of society" will have to be worked out.

III - IMPLEMENTATION

In its consideration of the social consequences of computerization, Government policy is moving from the planning to the execution stage and covers three areas.

- Administration -

A group has recently been set up under the Commissariat Général au Plan (office of the nation plan) to analyse these problems.

It will be a tripartite group (employers, trade unions, central government) and will call in outside experts. A group of officials has been appointed to coordinate social policy in the field of computerization.

- Computerization and working environment -

The "Mission à l'informatique", in cooperation with ANACT (Agence Nationale pour l'Amélioration des Conditions de Travail - national agency for the improvement of working conditions) have contributed to the publication of a "guide actif méthodologique (methodological guide)". This guide was presented to the press by the Ministers for the Civil Service and National Solidarity. It reflects the public authorities' wish for consultation.

Having established that three to four million French workers will be closely concerned by computerization, the guide underlines the need to take account of the quality of the working environment in computerization experiments. The Government is the principal client of the data-processing industry and provides an ideal subject for experiments. At the Research Symposium, François Mitterrand declared that the nationalized industries and the many sources of innovation in the small business sector would give impetus to technological development. The possibility of carrying out experiments in government offices prompted the "Caisse Nationale d'Assurance Vieillesse" (national old age insurance fund) to distribute the guide. It is intended to arouse awareness with a view to developing concertation in the decision-making process in connection with computerization.

- Training -

Training would appear to be one of the main bottlenecks in the electronics industry today. Despite the existence of many training centres, it is likely that between now and 1985 there will be a shortfall of some 300 - 400 engineers per year (the target is a 7 % per annum increase, as against 2.6 % at present).

A short-term emergency microelectronics plan is already being launched. It has four aims :

- to meet the demands of industry,
- to maintain close links with research,
- to maintain geographical equilibrium,
- to avoid dissipating the resources allocated.

Beginning this year, this plan should result in the training of 300 technologists and designers. Initially the plan is more concerned with the qualitative rather than the quantitative aspect, and it provides for the introduction of specialized microelectronics courses in certain schools and universities.

In the next stage, it should help to resolve the quantitative problem for it will encourage the creation of new programmes in universities (establishment of DEA - Diplôme d'études approfondies (diploma of advanced studies or Master's degree courses) and engineering schools.

A key element of this plan is the creation of four inter-university technological centres, endowed with substantial resources and closely linked to the schools and universities. The construction of three of these centres, which will be located in Paris, Toulouse, Grenoble and Rennes, is well advanced.

The CEMI (Centre de Micro-Electronique de Paris - microelectronic centre, Paris) has been in operation for some months. It links the universities of Paris VI, VII and XI with two ESSIEE schools and the ENST (Telecommunications).

In the case of Toulouse, the decision was taken a year ago and construction of the AIME (Atelier interuniversitaire de Micro-électronique) is well advanced. It links the Universities of Montpellier and Bordeaux and two schools in the region.

In Grenoble, the CIME (Centre Interuniversitaire de Micro-Electronique - microelectronic centre,) under construction links the University of Grenoble, the Polytechnic Centre and Lyon's University.

Matters in Rennes are not so far advanced. The unit will be set up around Serpelec.

This emergency plan responds to needs voiced in 1980. The second phase of the microelectronics plan will concern :

1. the possible creation of an institute providing a two-year course in microelectronics (100 trainees per year); at the same time the training role of the CNET and the LETI will be expanded;

2. incentive measures to encourage schools and universities to develop the technology and design aspects of their programmes. Technician training will also be taken into account in the second phase.

This plan is designed to meet the strong demand for engineers in the short term. According to a CEFI study (Comité d'Etudes sur les Formations d'Ingénieurs - committee on training for engineers) demand should level out from 1983 onwards.

IV - THE TWO SIDES OF INDUSTRY -

Although initially the two sides of industry seemed to be adopting a cautious stance, lately proposals have been forthcoming in two areas :

- Firstly, at the request of the Government, three trade unions have produced reports on the Sociétés de Service et de Conseil en Informatique (SSCI) (information technology).
- Secondly, some trade unions took advantage of the Research Symposium to call attention to, or clarify, their proposals.

- SSCI -

The CGT report considers that the transfer of the SSCI to the public sector means that the role to be assigned to these bodies should be seen in a different light. Among the SSCI activities that should be restricted with a view to their elimination in the long term, the CGT stresses the hiring of staff and here it accords with the CFDT's viewpoint : "At present, the SSCI are acting as temporary employment agencies and are thus evading the law by proposing technical assistance contracts to evade the three-month limit. This activity should be gradually eliminated and the workers in question should be integrated into the user undertakings".

The following activities should be developed, according to the CGT :

- advisory services with regard to the launching of data-processing projects.

- sectoral work in particular branches of activity, carried out in collaboration with users.

As regards data banks, the CGT considers that information of a public nature should be supplied by the SSCI as a public service to associations or groups of individuals.

As regards research and applications of the new technology, the CGT believes that the SSCI should be a source of proposals for technical solutions that would foster social progress. They should also, in liaison with the INRIA and the universities, work out new languages independently of the manufacturers.

With respect to the thorny question of computerized records and individual liberties, the CGT proposes that works councils and various joint bodies (industry-government departments) should have supervisory powers regarding the use of data-processing in this area.

The CGC (Confederation générale des cadres - representing managerial staff) have just submitted their report in the context of the discussions with both sides of industry on the SSCI launched under the aegis of the Ministry of Industry. The document is primarily a warning regarding employment problems. The CGC considers that it would be dangerous to reorganize the SSCI for this could :

- curb job-creation in the sector,
- result in the downgrading and loss of competitiveness of the French data-processing industry,
- bring major advanced technology projects to a halt,
- result in the total independence of the manufacturers, leading to the total independence of the users.

As can be seen, the views of the various trade unions and associations on this subject are far from unanimous.

Research Symposium

In the context of the Research and Technology Symposium, the SGEN-CFDT (the Syndicat général de l'éducation nationale - a teachers' union), and the CNPF (Conseil national du Patronat français - employers' association) set forth their proposals for developing research.

The SGEN-CFDT position

This union felt that the symposium was necessary as a preliminary discussion stage, but that its work should be carried further. A dialogue should be initiated with the trade unions and employers' associations to prepare the ground for the new law, "Orientation de la Recherche" (guidelines for research). It should be developed in the public and private sectors, both in industry and the services, by means to be determined, and also at regional level in the context of the preparations for the five-year plan. It should also go well beyond the national framework.

The CNPF position

The Government's objective - to increase the share of GDP allocated to expenditure on research and innovation. The measure would be based on the annual increase in research expenditure or the numbers of research workers and technicians recruited. Relief would be set against VAT, regardless of the firm's financial situation.

The employers' association also suggested the re-inforcement and extension of the existing range of financial aid measures, particularly those provided through ANVAR (Agence nationale de Valorisation et de la Recherche/National agency for the promotion of industrial research). The "innovation premium", hitherto restricted to firms with a workforce of less than 25, should be made available to all firms.

To meet recruitment needs, the CNPF proposed stepping up enrolments in engineering schools and promoting exchanges between the public and private sector.

IV - Studies and Research

With a view to democratizing research and information technology generally, the Government's policy lays stress on symposia or "open door" colloquia, for example:

- the Research and Technology Symposium held on 13 - 16 January;
- the "Supelec" forum on the subject of careers in data-processing and new technologies. Students and heads of firms in the region were brought together at this forum;
- the "Open-door" colloquium for research centres.

This took place a week later than the Research Symposium and was a great success. It was organized by the Ministry of Research and Technology to help democratize and "demystify" research,

- the day of meetings, "Les assises européennes de la bureautique" on office electronics organized by the Rémy Genton Institute. Rémy Genton will present a summary of European studies carried out by the Institute, of which one is entitled "La crainte des systèmes, compresseurs d'emplois et causes du chômage" (fears about systems that eliminate jobs and cause unemployment).

V - Sectoral experiments

For a time the Government simply continued experiments under way but is now branching out into new projects.

The Ministry of Telecommunications recalled that the major programmes initiated by the DGT (Direction Générale des Télécommunications - Telecommunications Directorate-General) will be continued in the area of specialized networks. The PTT (Post Office) will continue to allocate resources to new services this year.

Programme authorizations entered in the 1982 budget, amounted to FF 1 900 million, or 7 % of the total investment budget, as compared with FF 1 400 million in 1981. According to the Ministry, Transpac has been an undeniable success and provides a very good quality service. The Telecom 1 programme will complement this type of service and would seem to be definitively established with the success of the latest Ariens launching. The service will come on line in 1982, at first with experimental transmissions.

The video text experiment for the public at large will continue throughout the year. The two tables below list projects under way and those to be launched in 1982. A decision has just been made to implement a new project - the electronic directory and regional data bases.

EXPERIMENTS IN INFORMATION TECHNOLOGY FOR THE BUSINESS WORLD

. Under way

- Health : Computer aided medical diagnostic, Rennes. Begun November 1981.
- Agriculture : Agricultural cooperatives (Copasso) - Bordeaux. Begun November 1981.
- Tourism : Main Parisian hotels (Cititel), Paris. Begun December 1981.

. Soon to be launched :

- Press : Electronic newspaper, "voix du Nord", Lille
- Press : Eelectronic small ads, "La Dépêche", Toulouse
- Tourism : Open air hotel trade, "Le Provençal", Marseilles
- Social : Transfer of social data, Ceesi No. Marseille
- Agriculture : Telagri Loire - Atlantique, Nantes
- Agriculture : Telagri Aveyron, Toulouse
- Law courts : Telecopy of extracts from police records, Nantes
- Plant and installation : Flood warnings, Toulouse

EXPERIMENTS IN INFORMATION TECHNOLOGY FOR THE GENERAL PUBLIC

. In the cities :

- December 1981 : Esplanade district, Strasbourg - ARES - DNA
- December 1981 : Claire project, Grenoble
- December 1981 : Municipal information technology programme
Nantes
- Beginning 1982 : Central town hall and annexes, Lille
- Mid-1982 : Information technology plan for the town hall, Metz
- During 1982 : Corail Ville, project Blagnac.

. In rural areas :

- January 1982 : Ceesi Programme 7 : Post offices and town halls in the Alps, Haute-Provence
- February 1982 : Ceesi Programme 7 : Post offices and town halls in Lot-et-Garonne
- Second half of 1982 : Ceesi Programme 17 : televised meetings between municipal councils and local citizens in the Alps, in Haute - Provence

Source : 01 INFORMATIQUE

The Minister stated that the starting-up stage was complete, and that information technology operations had become routinely available for the business world. It would now be possible for businessmen to order Minitel terminals (electronic directory) directly from the manufacturers.

As regards the public network, measures are being taken to set up videotex access points in the main towns so that the Teletel terminals can be linked up with the Transpac network. On 11 February, Louis Mexandeau, the Minister, initiated the first experiment. In Nantes, citizens can question the computer directly.

Telem Nantes is the first French data-processing network to be made available to the population in public locations in any city. It is possible to consult the 4 000 pages of stored information free of charge from 14 points. In three month's time, 30 terminals will have been installed, some of them will be equipped with printers.

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May 1982

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I. THE PROPOSED EMPLOYMENT PACT AND THE INTRODUCTION OF NEW TECHNOLOGIES

April 30, 1982, the Belgian Government approved the text of an employment-pact which it submitted for consideration to both sides of industry, which actually discuss the pact.

The idea is to maintain the number of jobs until March 31, 1985 at the level of March 31, 1982 and by doing to stop the yearly loss of 30.000 jobs.

The pact contains 5 chapters:

- I. The maintaining of jobs in the private sector;
- II. The maintaining of jobs in the public sector;
- III. The monitoring of the introduction of new technologies;
- IV. The analyse of the possibilities for a redistribution of available jobs;
- V. Industrial policies.

Monitoring the introduction of new technologies

1. This chapter (III) starts from the idea that the job guarantee, the pact contains, will take care of the possible negative job impact of the necessary introduction of new technologies. So job security would be guaranteed.

The chapter on the monitoring of the introduction technologies concerns the involvement of employees and reads as follows (1):

"A maximum number of jobs can only be hoped for if the Belgian economy does not loose ground as far as technological progress is concerned. In this perspective use must be made of the possibilities which are offered through the introduction of new technologies".

2. The representatives of employees and of employers agree that it is, in case of the introduction of new technology, indicated for the employer to:
 - a) give the representatives of the employees information beforehand;
 - b) deliberate with them concerning the impact on jobs, the adjustment of the organization of work, vocational training, retraining of the

(1) Translation by the author.

employees concerned, the protection of health and safety of the employees, as well as concerning the impact on the quality of work;

c) make a yearly evaluation of the economic and social impact on the enterprise.

3. Information, concertation and evaluation, meant under n° 2, are organized exception made for the specific competence of the committee for health, safety and embellishment of the workplace, in the framework of the works council; if there is no works council, information will be given and concertation and evaluation will be hold with the trade union delegation.

4. Collective agreements will be concluded in joint committees, for the industry sectors concerning:

a) information beforehand concerning the introduction of new technology;

b) concertation concerning matters indicated under 2b;

c) a yearly evaluation concerning the social impact in the sectors.

The representative of employees and of employers agree about the usefulness of such agreements in sufficiently homogeneous sectors.

5. Similar information, concertation and evaluation, as described under nrs. 2 to 4 will be organised in the consultation organs of the public sector.

6. The interindustry collective agreement n° 9, concluded in the National Labour Council, concerning the competences of works councils will be adapted and completed to realise the monitoring of the introduction of new technology.

The project thus foresees wide information and concertation rights at the level of the plant - the enterprise and the industry sector. In a first reaction the employers association FEB indicated that they reject all limitations and obstacles, which may hamper the introduction of new technologies. An essential condition for inform-

ation and consultation rights in the respect of the managerial prerogative and managerial right of decision in this matter.

Other governmental action

Starting from the fact that enterprises do not seem to be in a position to accept government orders involving new technologies the government, on proposal of the Minister of the Plan and Scientific Policy, has enacted a decree aligning government need and scientific research. 500 million BF will, in a first phase, be allocated for research on advanced technology. The first contract will concern scientific institutions equipment for radiocommunications, distant control systems and the like.

The Flemish government will organize in Gent next year May 3-7, (1983) an international technological fair under the name: "Flanders Technology". In preparation a number of "technological days" are organized in order to associate the Flemish industry more with the third industrial revolution.

During these days information is given on:

- market prospects;
- field of application;
- research projects;
- actual industrial potentialities of different technologies;
- whether partners are needed to engage in joint ventures and the like.

A test day was organized at Boom, 27 april 1982, with emphasis on micro-electronics, bio-technology, and new materials.

The Belgian Employment Service organizes in Liège - already since three years - vocational training for unemployed engineers: it takes 9 months to introduce them fully into the new technologies; 5 months seems to suffice to train technicians. The "Centre d'Etude et de Fabrication de Prototypes" (CEFP) will retrain unemployed workers with regard to new technology.

II. THE NATIONAL COUNCIL FOR THE PROMOTION OF SCIENCE:
AN OVERALL STUDY

In our first report (1) we described the overall study the National Council undertakes since 1980. At the conference on labour relations and the introduction of new technologies, sponsored by the Belgian Association, May 14, 1982, for Industrial Relations, the Chairman of the Council, Prof. R. Van Geen, indicated that the conclusions of the study would be finalized June 3, 1982 and presented to the Government on June 16 next. We will obviously comment on those conclusions as soon as they are available.

(1) Social Change and Technology in Europe, February 1982, n° 4, pp. 114-116.

III. ATTITUDE OF EMPLOYERS AND WORKERS

A. Employers

- The employers' organisation (FEB - Fédération des Entreprises de Belgique) dealt with the "worldwide radical alteration of technological data" at the "5th day of the Belgian industry" (Brussels, 16th June 1981) which was devoted to "The Belgian economy in a changing world".

- This alteration was considered as one of the most far-reaching with which our country is faced, alongside the upheaval of our energy supplies and some raw materials, as well as the new international division of labour.
The impact of new technologies will be strongly felt in the 80's said Mr. PULINCKX. Their spread will moreover be complicated by the current state of slow economic growth, internal imbalances, social rigidities and low profitability.

- So Mr. PULINCKX quoted that "the introduction of new technologies requires a close attention from all sides of industry. Adopting to new technologies as well as the wish to overcome inevitable reticence, have also to be taken into account. Accepting and desiring change, are the true and only ways to protect the highest long-term levels of employment."

- Nevertheless, the reports and conclusions of the meetings' commissions do not propose an adjustment to the existing social protection regulations dealing with the implementation of new technologies. (Cf.: L'économie belge dans un monde qui change - 5ème journée des entreprises de Belgique - 16 juin 1981).

- However, the impact of new technologies on the economic and social structures and on training is commanding the employers' attention. The Flemish employers (V.E.V. - Vlaamse Economisch Verbond) intend to organize a seminar on the third industrial revolution (October 1982).

B. Trade Unions

(1) Fédération générale du Travail de Belgique (F.G.T.B.)

Some resolutions of the last Congress of the F.G.T.B. (19-21/11/81) are devoted to information on and the control of new information technologies.

"Microelectronics after interesting prospects but also imply the threat of major social consequences".

Consequently, the F.G.T.B. insists upon a "general framework agreement before microelectronics is developed further". This agreement has to ensure:

- guaranteed access to information in good time;
- compulsory negotiations where new technologies are introduced;
- all aspects to be discussed within the works' council in good time;
- trade union control with the help of independent experts.

Social costs would need new financial resources.

At the European level, new rules for social control over technological developments should be established. In this sense, the F.G.T.B. agrees with the main principles of the European Trade Union Confederation. The F.G.T.B. insists upon the drawing up of a "quantitative management plan on employment" and upon the extension of the "annual action programme" on health and safety into the humanization of work. In order to promote the humanization and democratization of work, health and safety committee should be assisted by multidisciplinary specialized teams in the prevention of occupational risks and the humanization of work. A whole chapter of resolutions is dedicated to the improvement of the quality of working life.

Finally, the Congress requires the adoption of rules to combat physical, mental and nervous stress.

(2) Confédération des Syndicats chrétiens (C.S.C.)

In "Les lignes de force d'une action économique et sociale" (Main outlines for economic and social action), the C.S.C. committee has provided for the adoption of agreements on the introduction of new technologies.

At the colloquium "Journées de l'informatique et de la télématique" (21-22 November 1981), Mr. R. D'HONDT, General Secretary, outlined the attitude of the national C.S.C..

A National Committee for new technology has been created by the C.S.C. National Committee. This Committee has to set up "clear trade union strategies on employment and working conditions, collective bargaining and the policy of public authorities" (See: "Journées de l'informatique et de la télématique, 21-22.11.1981, 120 p.)

Initially, information, training and the assistance of union representatives on new technologies and their social consequences will be expanded.

The G.N.C. (Groupement national des Cadres) has also created five committees devoted to the impact of new technologies on employment, private life, training, daily life and work organization. A seminar organized by the G.N.C. in Autumn 1982 on informatics and information will conclude the work of those committees.

The resolutions of the Congress of the C.C.M.B. (Centrale chrétienne des Métallurgistes de Belgique - Christian Metalworkers' Union of Belgium) contain an important section on the introduction of new technologies. The Congress requires the creation of a framework agreement inside the National Labour Council (Conseil national du Travail) in order to stimulate collective bargainings in the firms.

Those agreements should deal with the speed with new technologies are introduced and their social impacts with the fair distribution of profits resulting from this introduction, methods of control required for the workers' physical and mental health, means of safeguarding employment (shorter working hours, vocational training,...) and robotisation of areas which one are unhealthy, dangerous and repetitive.

(3) Centrale générale des Syndicats Libéraux (C.G.S.L.B.)

The C.G.S.L.B. representatives have presented demands in the banking and financial sector which has implemented a widespread application of microelectronics (See: "Le syndicaliste libéral, March 1982).

The main claims concern the fields of information, consultation, safety and training. Information should also be provided on the quantitative and qualitative consequences on employment and on working conditions (e.g. visual display units). The introduction of new technologies should be discussed (cooperation). An increase of profitability might also enable the social costs of automation to be lowered through shorter working hours. Safety requires special measures in the fields of protection (work at visual display units) and ergonomics.

Finally, workers faced with new technologies should take courses and attend vocational training.

C. Attitude of the two sides of industry towards the proposed Vredeling Directive

The C.N.T. (Conseil national du Travail - National Labour Council) and the C.C.E. (Conseil Central de l'Economie - Central Economic Council) have made a statement (06.10.1981) on the proposal for a Council Directive on procedures for informing and consulting the employees of undertakings with complex structures, in particular transnational undertakings (Vredeling Directive).

According to this report, the information that had to be supplied to the workers' representatives were as follow:

"manufacturing and working methods, in particular the introduction of new working methods, such as microelectronic devices and robotics."

Trade unions have approved those proposals in their statement of 6 October 1981. Employers' representatives consider that such obligations are not necessary: Belgian provisions in law and collective agreements being sufficient.

D. A project Master Agreement on the Introduction of New Technologies (1)

The Landelijke Bedienden Centrale, the Flemish Christian White Collar Workers Trade Union, adopted recently, in a follow up on its May, 1981 Congress (2), a project master agreement to be negotiated with the employers.

The project agreement starts from a positive approach towards the introduction of new technologies, which are looked upon as a chance and a challenge. In the preamble it is stated that the employees should be fully involved and that attention should be given to all relevant aspects, as well technical as social.

The project concerns following points:

1. Information

- Written information should be given as early as possible and at least 40 days before a decision is made; complete information has to be given in a clear and understandable way, concerning the introduction and the consequences, in particular concerning:
- the nature of the technology (hardware, software), scope and purpose;
 - the consequence of the introduction concerning:
 - . the number of jobs in the enterprise;
 - . the qualification of the jobs, including possible new jobs;
 - . human relations in the enterprise;

(1) Mention should also be made of the recent demands by the Christian Diamant Workers Union for a sectorial agreement concerning the introduction of new technology (more information and impact by employees on the decisionmaking, retraining) (April 4, 1982).

The "Mouvement Ouvrier Chrétien" asked at its Congress (April 17-18, 1982) a democratic control of the introduction of new technologies.

(2) Social Change and Technology in Europe, February 1982, n° 4, p. 117.

- the measures, the enterprise envisages regarding:
 - . jobsecurity;
 - . vocational training of redundant workers as well as workers whose job content is changed;
 - . the transfer to other functions, new functions included;
 - . human relations;
- Information has also to be given concerning:
 - . the health of the employees and
 - . the proposed measures to protect the health of the employees, accompanied by the opinion of the industrial medical doctor.

Information has to be given respectively to the works council and the union delegation and the committee of health and safety and embellishment of the work place.

Parties would agree that headquarters of multinational enterprises and of national enterprises with a complex structure have (1) to provide subsidiaries with sufficient information beforehand so that local management can live up to local law and practice.

2. Consultation

Representatives of employees are entitled to consultation concerning the introduction and the consequences of new technology in the course of a period of not less than 30 days. The representatives might be assisted by one or more experts, appointed by one or more of the representative trade unions. Experts would be entitled to be present at the meetings of the works council, the union delegation or the committee of health and safety, to contribute to the discussion and to ask for additional information. The experts are bound by the duty of professional secrecy.

(1) In accordance with the OECD Guidelines and ILO Principles for multinational enterprises.

Consultation with a view of reaching agreement

Where, in the opinion of the employee's representatives, the proposed decision is likely to have a direct effect on the employees' terms of employment or working conditions, the management of the subsidiary shall be required to hold consultations with them with a view of reaching agreement concerning the nature and the objectives of the new technology and regarding the measures planned in respect of them.

3. Suspension of the Decision

As long as the employer does not provide information, does not hold consultations, the new technology could not be introduced.

4. Job security

The employer can only dismiss after all other means have been exhausted, e.g. the creation of new activities of working time, part time work and transfers. In case of dismissal, the employee would be entitled at his request, to have leave of absence with pay during the term of notice in order to follow courses for vocational training.

The dismissed employees would be entitled to a preferential treatment in case of rehiring during a period of three years. The employer would be obliged to inform the former employees about openings.

5. Guaranteed Income

Employees, whose job would - due to the new technology - become less qualified, would be entitled to the remuneration of their former occupation, adjustment to cost of living included; without however being entitled to periodic raises until their remuneration levels with the one which is linked to their new jobs.

6. Vocational training

Every employee is entitled to the necessary vocational training, during working hours, also for new, better jobs (which are to be reserved for the employees-insiders). Vocational training is subject of concertation between the representatives of the employees and the employer.

7. Job enrichment

The employer has to see to it that the necessary attention is given to job enrichment, so that less interesting jobs get a richer content.

8. Health

The necessary measures should, in collaboration with the industrial doctor of medicine and in consultation with a view of reaching agreement, be taken by the committee of health and safety with a possibility of acceptance or refusing certain technologies, to agree on the introduction of rest periods, the setting up of a maximum number of hours work in certain cases and the like.

9. Control of job performance

Information technology may only be used for controlling the job performance of the employees in agreement with the representatives of the employees.

10. Privacy

Only those personal data, concerning the employee, which the employer needs for the fulfillment of his legal obligations, as employer, can be stored in the computer. The list of these obligations is communicated to the representatives of the employees. For the storing and use of other data the explicit agreement of the representatives of the employees is needed.

Yearly the employee will receive an offprint of his personal data. His remarks will be stored in the computer as well. Industrial data are only communicated to those, who need them for the application of the legislation; they cannot be commended to other third parties.

Follow-up

Yearly, a special meeting of the works council and of the committee of health and safety - eventually a meeting with the union delegation - will be hold in order to evaluate the impact of the new technology.

IV. THE BELGIAN ASSOCIATION OF INDUSTRIAL RELATIONS, CONFERENCE ON LABOUR RELATIONS AND THE INTRODUCTION OF NEW TECHNOLOGIES. MAY 14, 1982.

The Association, composed of academics, civil servants and representatives from the two sides of industry tried to evaluate the involvement of Belgian employees in the introduction of New Technologies and in the monitoring of the consequences on job security, health, vocational training and the like.

Introductions were given by Prof. R. Van Geen, President of National Council for the Promotion of Science; Prof. R. Blanpain, President of the Association and Prof. Bosmans from Groningen, member of the Dutch Rathenau Commission and Dr. P. Van der Hallen on a casestudy involving 10 electronics enterprises in Belgium. Then a pannel discussion was held in which representatives from business and labour discussed practical experiences in the automotive sector, the sugarrefinery, the metalworking sector and the newspaper-industry.

Although the meeting was not designed to reach conclusions or resolutions at the end of the day, the President of the association threw following impressions on the table:

1. It seems there is a necessity for societal options. Technology is not neutral; options need to be taken and employees should be involved.

2. Real decisions in the area however escape smaller countries like Belgium as well as the employees.
Whether new technology is used and what kind of technology is introduced is in practice a pure management decision in which labour is not involved.
In MNE's these decisions are centralized decisions and local managers are in reality not involved in the decision making either.
3. From there follows that the impact of employees remains marginal and relates only to accompaniment some of the consequences regarding health, training, job classification and the like.
Even this information and consultation may remain vague and insufficient.
4. The lack of expertise and experts, especially from the side of labour was felt as a real problem... there are no(t) (enough) trade union experts, who can effectively help employees in developing alternative strategies.
5. Job security was seen as a problem.
6. The participants' feelings were that sufficient attention was in practice paid to health-safety problems.
7. The need was underlined for a master agreement, along the lines of the Government and LBC proposals.

V. EDUCATIONAL INITIATIVES

Different new initiatives were taken: a.o.

- Proposals for a "M.D. in computer science" and a "doctorate" in technology are worked out at the University of Leuven;
- The "Vloebergh - science training programme organized for teachers in March 1982 - social information cycle on "minicomputers and informatics in teaching";

- A special programme "enterprise informatics" is organized, in the framework of the licence "for commerce and financial sciences" at the faculty of St. Aloisius, Brussels.

VI. VARIA

- In Belgium there are 4000 CAD/CAM's (computer aided design/computer aided manufacturing) in the industry ;
- April 21, 1982 a subsidiary of the Swedish group Asea was set up in Zaventem. The subsidiary will contain a documentation centre on robotics and a software centre for the implementation of microprocessors.
- 104 Flemish enterprises requested since 1979, technological aid at the regional development society.

* * * *

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May 1982

NEW (INFORMATION) TECHNOLOGY AND SOCIAL CHANGE IN THE UNITED KINGDOM : THE FIRST
THIRD OF INFORMATION TECHNOLOGY YEAR 1982.

Tim Brady and Ian Miles with Kurt Hoffman, May 1982

1. INTRODUCTION

1982 has been officially declared information technology (IT) year, and this report will concentrate on developments in the first few months of the year. Our previous reports in EPOS bulletins should be referred to for information about the background to many of the debates and developments described here.

At the outset we should warn readers that our task has become much more difficult in the last few months. We have extended the scope of our monitoring, and at the same time a veritable flood of comment, proposals, and projects has poured through the media. In consequence we are unable to present even the limited level of detail achieved in previous reports. We have not sought to cover all sectors in systems, concentrating on those where major developments are refuted. We think it most useful to indicate the scope of activity and opinion at present : more detailed work will be pursued in later specialised reports.

2. GOVERNMENT ACTIVITIES

The different strands of government activity relate to the concerns of Britain's government with a number of divergent policy perspectives. On the one hand, there is considerable concern with the problematic social consequences of high levels of unemployment, especially among youth. This concern runs up against the strong desire to limit public expenditure. This latter policy position has been relaxed to a limited degree in the efforts to promote IT in 1982.

Debate still ranges over training provisions for the young employed and the long-term unemployed. As we shall outline below, major new programmes are likely to be launched over the next year or so, but many key decisions remain to be made.

More generally, the government position is that IT is the key to jobs. Kenneth Baker, Minister of IT, said in March that "the choice is stark - automate or liquidate" (in his speech to an exhibition on engineering and productivity). A major innovation package, costing £130 million, is this to be put towards encouraging times to use microelectronics and to develop optoelectronics and satellite systems. Announced as part of the budget by Industry Secretary Patrick Jenkin, in early March, this was soon followed by the release of a report by the prime minister's advisory panel on information technology calling for the 'cabling' of the UK. Government support for the proposals put forward here has been translated into a time-table for 1982 which is planned to prepare the ground for a major cabling

programme between 1983 and 1990.

Having given some of the flavour of current government activities, we shall deal with such developments under the specific headings that follow:-

(i) PROMOTION OF R and D

The Science Policy Foundations journal OUTLOOK ON SCIENCE POLICY 4 (2) provided a helpful summary of major initiatives undertaken in the way of government support for IT between 1977 and 1981. We have described these in our previous report, and here reproduce the Foundation's table for reference, (Table 1).

A unit for IT in the Cabinet office is now empowered to co-ordinate IT initiatives made by different branches of government. IT year has been one axis around which different projects have been conceived, related together, and publicised. The major R and D developments have come with the allocation of £130 million (spread over three years) to encourage the vast majority of UK firms that are still not using new IT to re-examine their policies. Both Kenneth Baker and Patrick Jenkin have publicly expressed disquiet at the slow diffusion of IT, and demanded more industrial innovation to increase competitiveness. Baker told the National Economic Development Council in February (responding to a paper on electronics policy produced by the NEDC) that Britains international trading position in IT was deteriorating, and pointed to the relatively small scale of UK enterprises in this field. Jenkin had earlier announced a review in the Department of Industry aimed at reprioritising government aid away from sunset towards sunrise industries : currently less than 15% of the departments expenditure concerns new technologies.

The £130 million package announced in March represents almost a 50% increase in expenditure on IT. About half of it is intended to expand current aid programmes in IT. These include:-

- refunding the microelectronics awareness programme (MAP)
- more funds for the microelectronics industry support programme (MISP) giving aid for consulting support and product and process applications.
- extended education and training activities (see below)
- more funds for the computer software products scheme.
- increased funding for the encouragement of optoelectronics.
- new projects on medical applications of IT.

Other funds have been earmarked for manufacturing industry to experiment with computer-aided manufacturing, and for satellite technology (including remote sensing, direct broadcasting, and preparing for cable initiatives). Tax allowances on teletext TV sets bought by rental companies is being extended, with the intention of stimulating the industry.

TABLE 1

British government support for Information Technology * (major initiatives since 1977)

<u>Programme</u>	<u>Amount</u>	<u>Date</u> (period)
R & D support Programmes:	(£million)	
Microelectronics Industry Support Progr.	55	1978 (5 years)
Microelectronics Application Projects	55	1978 (5 years)
Microelectronics Education Programme	10	1980 (3 years)
Microcomputers in Schools Programme	5	1981 (2 years)
Information Technology	80	1981 (3/5 years)
Computer Aided Design/Manufacturing	6	1981 (3 years)
Robotics Support Programme	10	1981
Fibre-Optics Scheme	25	1981 (5 years)
Telecommunications satellites:		
Contributions to European Space Energy ⁺	105	1977 (6 years)
L - Sat contribution to ESA	77	1981 (5 years)
Computers	**	

Investment/shares in (semi-) state owned companies through the National Enterprise Board/British Technology Group:

INMOS (memory chips)	50	1978
Nexos (office equipment)	28	1979
Insac Group (software marketing)	5	1977
Q1 Europe Ltd. (microcomputer systems)	4	1979
Quest Automation (computer aided design)	3	1981
Aregon Group (Viewdata software products)	5	1980
Software houses (total)	3	1977/1979

* excluding investments in Post Office/British Telecom, BBC and defence R & D.

** ICL, the British state company for (main frame) computers does not receive direct financial aid from the government; the government has, however, provided a loan guarantee of up to £200m to the company for the period of 1981-1983;

Source : Outlook on Science Policy Vol 4 No 2

As can be seen, major elements of these plans will involve allocating funds to R & D activities in private industry (typically with the government underwriting 25% of the firms costs). In addition, the Department of Industry announced to a private gathering in February, according to information leaked to the GUARDIAN newspaper (18/2/82) that £50 million per year is to be allocated for five years to fund R & D on computer technology. The aim is to compete with Japan, in particular in future generations of computers. As well as software development, dataflow architecture and computer communications networking, the aim is to stimulate activity on very large scale integration (VLSI) and custom design of silicon chips. Currently a feasibility study is underway, and the expectation is that government will fund basic research in central institutes to which industries will contribute staff, and will fund a portion of subsequent development costs.

(ii) LABOUR LAWS AND WORKING CONDITIONS

We have no systematic information under this heading, but wish to draw attention to a programme broadcast on BBC Radio 4 on 24/2/82 (FILE ON FOUR). This discussed the American experience with 'preventative labour relations' in IT industries, and suggested something of the sort might be developing in the UK. In the US, specialist lawyers are involved in working out legal frameworks within which the workforce can be discouraged from unionisation or industrial action. UK unionists were reported as suspicious that the beginnings of such practices were apparent in the UK. This discussion of course, takes place within the context of major union opposition to the Conservative governments proposals to restrict trade union activities.

(iii) SAFETY AND HEALTH

No new information to report.

(iv) EDUCATION POLICY

Our last report mentioned the possibility of extending the programme of subsidies to secondary schools, for half the hardware costs of microcomputers. Part of the Budget package referred to above will be allocated to this purpose : primary schools will now be able to apply for a subsidy of equipment costs. Kenneth Baker has expressed his enthusiasm for the eagerness with which many children have taken up IT. Evidence for this eagerness is plentiful. There were over 600 entries for a Department of Industry competition concerning the use of microcomputers in schools, and children dominated the Sinclair ZX81 Micro Fair in London in January.

An issue of the TIMES EDUCATIONAL SUPPLEMENT (2/3/82) on COMPUTERS AND EDUCATION contains a critical review of the Microelectronics Education Project (MEP) - not least for failing to keep its clients properly informed about its own activities. The extension of microcomputer subsidies to primary schools is criticised given the lack of appropriate teacher training and of primary school software (though a range of packages is to be issued shortly). Many programmes prepared for secondary

schools are not yet widely available, with battlements over contract negotiations.

From other quarters (eg Harvey Goldstein's letter to the GUARDIAN of 12/11/81) attention has been drawn to the contradiction between the cuts in funds to higher education (which would be expected to respond to new demands for teacher training) and the MEP itself.

Nevertheless, some higher education establishments have undertaken relevant initiatives. Imperial College computer Centre has helped establish CEDAR (Computers in Education as Resource) which provides information on computer assisted learning in a wide range of subjects.

The last of the fourteen MEP Regional Education Centres, which are being linked to each other by communicating word processors, have now been established. Regions have considerable responsibility for developing their own resources, courses, and initiatives, and are also drawing funds from local education authorities in many cases. MEP centres in four cities have been set up to cater for the need of special education (eg for the visually handicapped). Further plans are anticipated in the special education field for later in 1982.

The BBC microcomputer has now become available, and the associated computer education series began for schools on TV in January. Delays are still being experienced by those wishing to purchase the computer, one factor behind this being a surprising preponderance of orders for the more powerful and more expensive versions. This meant a slight postponement of the evening showing of the series, which began in February. Together with the TV programme and the computer itself, BBC has published THE COMPUTER BOOK (60 thousand copies sold by early February) and a book and cassette course 30 HOUR BASIC' is produced by the National Extension College. The BBC has a software library which will be launching programmes from May on. The whole scheme is referred to as BBC's Computer Literary Project, and initial reactions appear very favourable.

Finally, plans to set up an Open Tech (see previous reports) using IT distance learning and existing college and Open University resources to provide services to tens of thousands of technical students annually, are forging ahead. The Manpower Services Commission is expecting a report by the Summer indicating development and running costs; and it is hoped to launch the first courses in the Autumn. They will probably be for adults on technical training and retraining.

(v) TRAINING AND RETRAINING

In general the scheme here is very complicated, with the controversy over the proposed Youth Training Scheme (see last report) overwhelming most other issues. At the

time of writing (early May), press reports suggest that the government is going to concede to demands that a reasonable wage will be paid to young trainees and to go some way towards ensuring that training rather than cheap labour is involved; but it is holding firm to its view that youth who refuse to participate in the scheme should be penalised by having their entitlement to welfare benefits stopped.

Related controversies surround the decisions to wind down the training activities embodied in two thirds of Britains Industrial Training Boards, and the restructuring of higher education in which general expenditure costs are accompanied by little in the way of a shift of resources towards training for IT. Numerous critical voices have been raised on these issues, from the Training Boards and the education sector themselves, and from unions and the Labour Party in the main. (Much of the public debate has gone on in the Education Supplements of the TIMES and GUARDIAN newspapers) But even a study group backed by many leading industrialists and chaired in the UK by Sir Montague Finniston has criticised the YTS as too restricted and too short (in the report YOUTH UNEMPLOYMENT : THE APPROPRIATE RESPONSE : JOBS IN THE 80'S).

We can now give more information on some more IT - oriented initiatives referred to in previous reports. In December 1981 £9 million was allocated to setting up 30 IT centres in major cities. These are aimed at training young unqualified school leavers in electronic assembly, computing, and basic IT skills. Each centre will train 30-40 youths annually. The model is a successful centre in Notting Dale, London, and the eventual aim is to set up around 100 centres by 1983. In March 1982 it was announced that these centres were to be equipped with Technographics Computing editing terminals giving access to Prestel and to a nationwide network. The first students were enrolled in April.

(vi) AWARENESS ACTIVITIES

Most of the government schemes here have been described in passing above or in previous reports where the plans for IT year were summarised. Suffice it to say now that the IT year lingo has become familiar from shopfronts, book covers and newspaper articles, and that the BBC initiatives in particular seem to be attracting greater public attention than anticipated. A galaxy of books and magazines cashing in on the microcomputer boom now dazzles the browse at railway station stalls, let alone educational bookshops.

3. SOCIAL GROUPS

We have decided to designate a number of additional categories under this heading, for otherwise very disparate items are carried under the same titles. We now include, in addition to 'trade unions', 'employers', 'agreements', 'other organisations' and 'labour disputes and other conflicts', the new headings of 'political parties and organisations', 'social uses of IT', and 'privacy, secrecy and surveillance'.

(1) Trade Unions

The main preoccupation of the unions at the national level has, of course, been unemployment. During 1981 perhaps 600 thousand members were lost, bringing total union membership down to 11 million - and much of this decline reflects unemployment. This concern with unemployment has been the dominant theme in Trade Union Congress statements about IT (for more background see previous reports).

One line of possible advance is a scheme being considered by the TUC that would request the government to give financial incentives to employers and workers who participate in moving towards a norm of 35 hours as the working week in 1983. Terry Duffy, president of the Union of Engineering Workers, proposed an international trades union campaign aimed at a 26 hour working week by the end of the century (in a report by Incupon Management Consultants, INDUSTRIAL ROBOTS IN JAPAN, US AND UK).

While the case for the shorter working week goes well with arguments about the need for IT, the TUC has warned more generally that opposition to IT will grow if workers are not offered more job security. Ken Graham, TUC assistant general secretary, told a conference organised by the Institute of Production Engineers in March 1982 that a laissez-faire approach was insufficient, and criticised both government (for advocating productivity per se rather than social goals) and the confederation of British Industry (the CBI, for moving away from the idea of new technology agreements). He put the case for refined working hours and expanded education and training programmes and increased public services. (It is worth noting that Duffy and Graham reject the notion of rethinking the work ethic, which has been advocated by the white-collar union leader Clive Jenkins).

Although the TUC is opposing a 'Ludlite' approach for its central offices, it is worth noting its opposition to the establishment of local trades union resource centres. This is despite some such centres - like TUCRIC at Leeds - having been diligent in compiling data on the consequences of IT for particular towns and regions. It is reported that union leaders fear a sidestepping of established hierarchies by such resource centres, who often enjoy the support of activists from women's organisations and community groups, as well as militant trades unionists. (YOUR JOB IN THE EIGHTIES : A WORKING WOMAN'S GUIDE TO THE NEW TECHNOLOGY by Ursula Huws, recently published by Pluto Press, is based on the TUCRIC report on women and IT in Yorkshire). Local authorities, however, are

providing funds for some such centres.

(ii) EMPLOYERS

The attitude of various employers groups to the question of unemployment is to be concerned by the scale of the problem - especially where youth are involved - but to argue that high wages and Union restrictions are responsible. On the whole IT is welcomed and, in line with government attitudes, seen as the key to survival and thus was apparent at the CBI conference in Autumn 1981. Against the most vocal opinions, one speaker argued that jobs cannot now be created for all of those unemployed, while another argued that unfashionable primitive industries remained essential and that too much faith could be put in sunrise industries. The CBI continues to call for more job cuts in the public services. In the beginning of 1982 a working party on unemployment was set up, including chairpeople of various companies (one of which is Mrs. Kenneth Baker), which is to attempt to set out long-term policy options.

(iii) AGREEMENTS

'Productivity' has emerged again as a key theme in industrial argument, and readers might find it useful to consult a review of 1981 productivity agreements by David Felton published in the TIMES (21/2/81) under the title 'A leaner and fitter industry'. The analysis of particular agreements has tended to be overshadowed by arguments about the meaning that can be attached to current statistical rates indicating productivity improvements in UK industry (which may reflect real gains, and industrialisation or simply low output in the recession).

Two disputes concerning new technology agreements (NTA'S) have been much discussed. In one case the Banking, Insurance and Finance Union (BIFU) has been repeatedly warning that job losses are accumulating around IT. BIFU has protested that Banking and Finance companies are not negotiating NTA's. In March its assistant secretary, Tom Molloy, addressed the computer section of BIFU on this theme, and the conference voted for a campaign to obtain NTA's. The long-term aim here is a 28 hour, 4 day week.

The other notable case concerns the civil service, and continues the saga noted in previous reports. After many prevarications on both sides the main civil service unions in March voted to accept a government offer of a two year interim NTA. There was, within the Council of Civil Service Unions, dissatisfaction expressed by one of the medium-sized unions here, as well as by members of other unions. Part of the NTA is a guarantee of no compulsory reductions within the two year period, but there are no provisions for shorter working hours or sharing of benefits. The unions had been previously threatening non co-operation with the introduction of IT, while the government was initially unwilling to introduce an NTA. However, the unions have noticeably not gained any substantial say in the design of the technologies in question, although there is provision for local consultation about

the speed of their introduction and standards of service.

(iv) Other Organisations

Community Groups, the women's movement, and the growing movement of the unemployed (focussed around Unemployed Workers Centres) have expressed concerns about IT and job loss, often focussing upon specific areas or social groups. One group, Earth Resources Research Ltd. has been involved in a number of seminars on IT for activists. In a report BEYOND GENERALISATIONS : ISSUES IN THE TECHNOLOGY DEBATE (issued by South Bank Polytechnic), this environmental group criticises proposals like early retirement and shorter working weeks as glib solutions to the problems of new technology. They argue that early retirement would be extremely expensive. While this and reduced working hours would increase the number of people on the 'poverty line' dramatically.

In general, rather few of the activities and pronouncements involved have made much media impact, however, or been closely related to major industrial disputes. Initiatives from local authorities have been discussed in previous reports, and will be taken up in the R and D section below.

(v) LABOUR DISPUTES AND OTHER CONFLICTS

The two NTA cases referred to above have neither reached the level of industrial action. It should be recalled that the civil service dispute followed on last years major disruptions and stoppages (see previous report), while the banking and finance sector has been relatively strike-free. Some voices in BIFU have called for action to force employers to negotiate NTA's but to date the proposed campaign is more of a consciousness-raising exercise.

Experience in specific sectors will be dealt with in section 5 below. At this point we may just make a few remarks about the industrial situation. First, the increasing levels of unemployment seem to have reduced workers' militancy, so that there has been a decrease in recorded industrial activity and the most publicised cases have concerned factory closures. Two major exceptions may be noted. Public expenditure limits have been translated into a norm of 4% wage increases for most public sector workers (not, however, military, police etc.). This is well below the rate of inflation, and health service workers are particularly aggrieved : withdrawal of all but emergency services is increasingly likely. The other exception concerns rail workers, where one of the three unions - ASLEF - has been outspoken in resisting 'flexible rostering'. This is an attempt by British Rail to increase productivity by introducing more variety into hours and duties worked, and reflects long-term developments in rail technology. Over the winter a number of one day strikes paralysed rail services, and at the time of writing a resolution to the dispute is uncertain, though both parties refrained from acting while arbitration continues. The arbitrator's report, published in May, supports flexible rostering given a number of safeguards.

Conflicts have continued spasmodically in the print industry, with newspaper management still seeking major reductions in staff - such conflicts are often related to IT in newspaper production. A notable high-technology conflict earlier this year involved Plessey, the electronics multinational, who faced a workers occupation when they sought to close their Bathgate (Scotland) plant as part of their Europe-wide rationalisation. The dispute set claims about the viability of the individual plant against the company's concern with its global profitability. On the one hand the equipment in the factory was claimed by Plessey to be obsolete, although workers believed that it was to be relocated by the company in Italy; on the other hand Plessey has adopted a new industrial strategy focussed on sunrise technologies and defence contracts.

(vi) Political Parties and Organisations

In further reports we hope to elaborate information under this heading. At present we have one item to report : a response to IT year supported by Tony Benn, leading Labour Party leftwinger. This is a short film, NEW TECHNOLOGY, WHOSE PROGRESS? made for unionists and community groups. With case studies of changing working conditions and job losses, the argument is put that IT is mainly used to increase management control of the labour process. (This viewpoint has been elaborated by groups like the Conference of Socialist Economists as well as a number of prominent unionists). The way forward indicated is international union activity corresponding to the transnational power of capital, and intervention into the design stage of IT so as to facilitate progressive social uses.

(viii) SOCIAL USES OF IT

We think it is worth going beyond the workplace to consider some more or less controversial applications of IT. A number of initiatives towards social applications of IT have been forthcoming in IT Year (over and above those in special education mentioned above). Among these are:-

- Sunderland Council is installing a computerised alarm system for all elderly residents of the borough. By 1984, at a cost of £2 million, 12,000 houses will be equipped with emergency cord pulls which, when activated, will trigger off alarms and print-out of information about the household at a central computer terminal - enabling emergency services to be dispatched. Concerns have been raised about privacy, although residents are free to opt out of the service.
- The Department of Health and Social Security is to install self-service mini-computers in six English cities in July, following a voluntary initiative in Cardiff, Wales. Claimants of welfare services will be able to interact with the computer so as to establish their benefit entitlements.
- The Greater London Council placed a £3.2 million order with Marconi in January for computer equipment for the fire services. The computer system is aimed to provide up to date information on the current availability of crews and appliances, speeding up the delivery of fire fighting services.

- The American Company ADT Security Systems automated its central station in Manchester (other cities are to follow) so as to allow rapid response to break-ins in industrial, commercial and private properties. The computer system can analyze alarms in terms of data about the property involved, its opening times and routines.
- As part of IT Year a campaign was launched in April to encourage production of aids for disabled people, and awareness in the health service of the potential of IT use. At a press conference in London an accountant demonstrated a system he uses in running his own business, in which he controls his microcomputer through sucking and blowing through a tube. Around a dozen models of this particular device are in use in the UK.
- Following the lead of France and Japan, the Minister for Overseas Development participated in the launch of a Third World-oriented Council for Computer Development. Its aim is to advise Third World countries on the use of computers and the development of computer skills. (Some criticism has been forthcoming from proponents of appropriate technology). Financial support has mainly come from the Department of Industry and computer subsidiaries of major electronics companies.
- In a letter to the GUARDIAN (14/1/82) a researcher from Queen Mary College, London, argued for the use of microprocessor systems in monitoring train movements, thus removing a vitally important responsibility from signal box workers. This followed the inquiry into a train crash in which much was made of the lack of back up for an inexperienced worker forced to make decisions with a purely manual system.

(viii) PRIVACY, SECRECY AND SURVEILLANCE

This continues to be an issue of high controversy and alarming revelation in the UK. In our last report we mentioned the way in which journalists had been able to acquire information from 'secure' police computers. Since then there was a minor sensation when a tabloid newspaper published the contents of a file on a member of Parliament who was at that time raising questions about computer privacy (Michael Meacher).

A second event that raised many eyebrows was the "bugging" of a public telephone box in North Wales. (The probable rationale was to provide data relevant to Welsh nationalists involved in setting fire to holiday homes in the area). In the subsequent furore, the Home Secretary announced to Parliament in February the existence of hitherto unknown guidelines on clandestine surveillance.

(Previously only telephone tapping and mail opening had been recognised as subject to guidelines) The guidelines were later published, and found to represent a considerable extension of police powers.

Given that these events occurred early in the year, it is likely that sales have boomed for anti-surveillance devices. One such, Phonalert, sold 10,000 models in two weeks in the autumn of 1981, through mail-order advertising. A red light is set off when there is a change in the phone lines power - which might reflect bugging or a crossed line. It would not have been of much use in the North Wales incident, where it seems likely that the device involved was a radio transmitter.

Public concerns about data banks was reflected in the refusal of West Yorkshire's police committee to support the local police in a £1.7 million project to expand their computer use. This is despite claims that computer systems would have meant that the 'Yorkshire Ripper' could have been apprehended. The decision has been temporarily deferred.

COMPUTING magazine in March published a report claiming that MI5 has spent some £20 million on computers capable of holding sizeable records on all inhabitants of the UK, and with limits to data sources in other ministries. The Ministry of Defence refused comment on this story.

Such controversies have led to increasing government emphasis on the need to regulate data banks. A White Paper produced in April gives proposals to ensure that data users comply with the Council of Europe Data Protection Convention. These involve a system of registration of data users, from which individuals can gain access to information stored about themselves. However, there would be no compulsory codes of practice, which has provoked criticism from the National Council for Civil Liberties (NCCL). The NCCL also suggests that the proposed team at the register would be too small and inexpert to cope with the problem, and that abuses concerning sensitive manual records will go uncontrolled. Other issues that are likely to be controversial in the future concern the exemption of some official data banks (state security, state financial interests, criminal justice, public safety) and charging individuals to inspect their records.

This is the latest installment in a long saga documented in our previous reports. It is notable that current government proposals still fall far short of the Lindop Committee's request that legally enforceable codes of conduct be implemented by a data protection officer. Michael Meacher, Labour MP, has been very active in Parliament around the issue of privacy, and the medical profession in particular has suggested that protection of patients rights require more stringent safeguards. It is likely that the saga will continue beyond the life of the present government.

Security applications of IT continue to abound, and some of these are outlined in 'social uses', above. One more that may be worth mentioning here was described in the JOURNAL OF THE FORENSIC SCIENCE SOCIETY in February - a computerised system for identifying the machine on which documents have been typewritten. This system is able to cope with the proliferation of word processors and electric typewriters.

4. RESEARCH

(i) Technical R & D

We shall not discuss the 'hot' issues in basic research, although it should be recorded that there has been much discussion of fifth generation computers; and of thin film, organic and optical processing chip technologies, (the Science and Engineering Research Council has set up a working party in these areas). We shall focus on two distinct areas : telecommunications R and D, and local initiatives to develop R and D facilities.

As for telecommunications, British Telecom announced in February that a new fibre optic system had been developed which can double the distance of cable down which signals can be sent. However, the development time of several years will mean that less efficient fibre systems (with amplifiers every 8 kilometers, rather than the 100 kilometers now possible) will be installed in the programme to link up with British cities in the 1980's.

A report commissioned by European PTTs and written by the PA consultancy group, released in January, emphasises the role of wireless communications. It forecasts that 80% of the population and 20% of vehicles in Europe could carry portable radiophones. Some thousands of radio phones are already in use in Great-Britain (illicitly), and problems of interference are likely when the density of use increases. R and D on networks to reduce these problems is recommended.

A last note on telecommunications is that the IT Year-related, Department of Industry - sponsored; research into the use of mains electricity as a medium for meter reading and domestic energy management is now underway. Installation of equipment for field testing in London and Milton Keynes was announced in ELECTRONICS AND RADIO TRADING (11/3/82). The Mainshome Signalling System project involves Thorn-EMI co-operating with gas, electricity and water utilities.

Local R and D initiatives largely focus around science park ventures. One exception is a scheme launched by West Midlands County Council in February, aimed at helping people set up local co-operatives.

A SUNDAY TIMES (21/3/82) report on science parks notes that six have been established to date, with 15 more planned. The intention is to speed up transmission of ideas between basic research and applications. The first such park in the UK at Cambridge, was established in 1973 and now has 24 countries employing 550 people, including workers on silicon chip manufacture. We have provided references to various such initiatives in previous reports : To these

we may add developments in Birmingham, where the City's council and Lloyds Bank are establishing a £2 million venture capital company to attract new technology entrepreneurship to the science park due to open there shortly. Priority is to be given to IT, biotechnology and materials.

(ii) Social Implications

While books about IT continue to pour out, little substantive research into social implications has been published since our last report. One exception is MICROELECTRONICS AND WOMENS EMPLOYMENT IN BRITAIN from SPRU Women and Technology Studies, at the Science Policy Research Unit, Brighton. This book concludes that woman's jobs and working conditions are particularly vulnerable to changes associated with IT, substantiating this by an extensive research review together with an analysis of women's work in the UK.

Another topic that has attracted some attention is the regional impact of technological change in the economy. The Economists Advisory Group have published ENTERPRISE WEST, a study of small businesses in the West of England, arguing that the West could be the pivotal site of new technologies (if obstacles related to infrastructure, skill and capital shortage are overcome). This has helped stoke the debate about the uneven regional location of IT enterprises: a series of articles in the GUARDIAN has drawn attention to their clustering to the West of London where several government scientific establishments are based, with good transport services, a pleasant environment, and access to higher education facilities. The problems that this magnetic pull of relevant infrastructure poses to attempts to rejuvenate declining regions are increasingly recognised, and it is intended to provide more detail on research here in later reports. The Centre for Urban and Regional Development Studies at the University of Newcastle is known to be carrying out a number of highly relevant studies.

Finally we draw attention to a number of attempts to investigate and overcome the problems of small firms buying microcomputers. Manchester University Microcomputer Advisory Services has been running evening seminars to develop skills in selecting and implementing computer systems. And Marketing Consultancy Research Services (of the University of Lancaster) published their SMALL COMPUTERS IN SMALL COMPANIES which involves a survey of companies using micro and mini computers. Companies in the main had good experience, but 25% had installation problems, 60% software or hardware problems in the first six months (and only 50% thought their software an unqualified success). Most difficulties were associated with cheap computers and higher pressure selling.

(iii) Alternatives

No new information.

5. EXPERIENCES IN SPECIFIC SECTORS

Introduction

Our last report indicated no signs of the recession lifting and current reports give no grounds for optimism. Output is stagnant, although there could be some slight growth in output in the autumn. Unemployment is likely to increase sharply from its present level of over 3 million when school leavers increase the available labour force. The rate of inflation has been falling steadily and this could lead to some attempts by the government to stimulate the economy.

(1) Offices

There were several announcements of new firms entering the market for equipment for the electronic office, or developing local area networks.

Two small Bristol companies Sension Scientific of Cheshire and its sister company Turnkey Systems have gone into production of Eternet equipment and are the first to both design and manufacture such equipment in the UK.

GEC has also set up a new office of the future subsidiary - GEC Information Systems. This will bring together GEC's existing information technology companies: GEC Computers; GEC viewdata; the private systems and telephone divisions of GEC Telecommunications; and the marketing company Reliance Systems.

Racal has announced that it will produce its own local area network. Racal-Milgo's Planet System is a descendant of the British Cambridge Ring system. The new system will be available to customers from this summer.

Nexos, the British Technology Group's office of the future company, was broken up in January following the collapse of negotiations with Gestetner. As a result of this ICL will take over the marketing of the 2200 word processor in the UK, although Logica will continue to manufacture it through its subsidiary Logica VTS. In February Logica VTS announced that they were going to market the 2200 independently but only to overseas dealers.

Also in February the Cambridge Computer Laboratory announced that they had developed faster, cheaper, more flexible uncommitted logic arrays to interface with the Cambridge Ring local area network. They will be able to carry voice as well as data and, according to Dr. Andrew Hopper, one of the Ring's designers, they will make the Cambridge ring much faster than the Ethernet system.

There have been more trials of electronic office equipment. One of the first working electronics offices using the XIONICS system was officially declared open by Kenneth Baker in February 1982. The system is being used at BP's

Oil's computer and accounting centre in Hemel Hempstead.

A further trial by the Department of Industry was started in March. It differs from the others undertaken so far in that the office situation is aboard a car ferry operating between Felixstowe and Zeebrugge. From computer-run colour screens the Captain can consult transmitted information from the viewdata services of Britain, Germany and Finland, including navigational warnings, weather forecasts or reports on port delays. The system can also be used for sending and receiving electronic mail and other computer data and these services can be undertaken by giving simple voice instructions to the computer. The system known as Seaview 82, could later spread to ships worldwide via satellites. It is the result of a partnership between the British Computer Systems Company CAP which designed it; the German Group Siemens which provided the equipment; British Telecom which runs the radio links; and Liverpool Polytechnic which gathers the data bank of shipping information.

The Greater London Council (GLC) is planning to install a £4 million advanced electronic office automation system for County Hall. The system is expected to be very large, with the potential for 600 terminals. Tenders for the complete system will be sought next year but in the meantime the GLC hopes to install a pilot system, costing £500,000, for a year. So far more than 25 suppliers have put forward proposals for this pilot system.

REFS : Electronics Times 14.1.82
 4.2.82
 18.2.82
 25.2.82
 15.4.82
 29.4.82

"Electronic Office Takes to the Water"

P. Large Guardian 19.3.82

(ii) Banking, Insurance, Finance.

In January the microelectronics committee of the Banking, Insurance and Finance Unions claimed that banking and finance employers were refusing to involve staff in decisions about introducing new technology. According to Terry Molloy, the joint secretary of the committee the impact of new technology on jobs was already being felt. There was a sharp drop in recruitment by the big town banks over and above what might be expected because of the recession.

The following developments were thought by BIFU to be likely to harm staff interests if introduced on employers terms.

- (i) More automated teller machines (cash dispensers) with an increasing range of functions.
- (ii) Control terminals which reduce paper transactions on individual office computers, which also reduce paperwork, such as the IBM 8100 which National Westminster is trying out in its Swindon Branch.
- (iii) What BIFU believes is "imminent expansion" of banking by viewdata systems, allowing customers to carry out electronic transfers from home.
- (iv) "Lobby banking", or offices consisting solely of machines and related developments of largely automated "in-store" banking.

In March the first computer section conference of BIFU took place. The conference voted for a campaign to obtain new technology agreements in banking, insurance and finance. Terry Molloy said that job losses were "creeping in on computer operations departments without us really noticing".

Further to this BIFU is to launch a spring campaign to increase awareness of the dangers of introducing new technology on employers terms.

BIFU has met little success in persuading employers to sign agreements which would protect jobs from technological change. The clearing banks, especially, accuse BIFU of "scaremongering" saying that the union is merely trying to recruit by spreading fear.

The union cites job reductions at Midland Bank's head office, and redundancies at Lombard North Central, National Westminster hire purchase and lending company as examples to back their case.

REFS : "Bank union warns staff of new technology jobs threat"

Brian Groom F.T. 5.4.82

"Bank Union worried by new technology"

Brian Groom F.T. 28.1.82

"Bank staff fear threat to computer jobs"

Brian Groom F.T. 12.3.82

(iii) Retail Sector

The large supermarket chains continue to expand. ASDA stores are to open nine new stores each employing between 300 and 350 employees, partly in a continuation of their move into the Southern areas of Great Britain. In a mirror image move Fine Fare plan to spend £100 million on expansion, including the opening of 25 new stores by early 1984, and most will be in the northern half of the country. Tesco, Sainsburys and Bejam are all expanding and facilities in all these stores are likely to include electronic technology.

The preliminary agenda for the shopworkers union, USDAW's annual conference has a total of 15 motions and two amendments tackling the rise of youth employment and training, and Industrial Training Boards. Equal rights will feature prominently at the conference and anxiety over the lack of women participating in the Union is expressed in a paper 'Women and Usdaw' which the executive will present to conference. The paper notes that in April 1981 women in retailing earned on average £30 per week less than men, partly because they are concentrated in low-paid unskilled positions.

REF : "Shopworkers take tough stand against youth training schemes"
David Goodhart F.T. 10.4.82

(iv) Printing

A book looking at the introduction of new technology in newspapers was published in March. The book "New Technology and Industrial Relations in Fleet Street" by Roderick Martin (Clarendon Press : Oxford University Press) uses as its core the account of the attempts by three groups - the Financial Times, Times Newspapers Ltd., and the Mirror Group - to introduce technological change with reformed industrial relations and working arrangements.

The problems at the Times and Sunday Times have never been satisfactorily solved and disputes continued there over this year over cuts in manning levels of clerical workers. An agreement on job cuts was eventually agreed in March between Mr. Rupert Murdoch, the proprietor, and SOGAT. The company was originally seeking cuts of 390 posts but the final settlement is thought to be between 180 and 220 posts.

The Industrial Relations situation in Fleet Street is much worse than other sectors of printing but the importance of good industrial relations with respect to the introduction of new technology is just as evident.

A recently published study of the effects of technological change on skills and employment on the folding carton industry highlights the need for training in industrial relations. "Not only managers, but also trades union officials urgently need training in the implications of new technology" says the report. "Inadequately trained management is considered by some firms (and their union officials) as an important reason why companies have not been able to reach competitive manning levels"

REF : "The implications of technical change for skill requirements in the folding carton industry" by T. Brady, D. Scott-Kemmis and P. J. Senker. Published by (and available from) the Paper and Paper Products Industry Training Board, Star House, Potters Bar, Herts. EN6 2PG

(v) Telecommunications

There have been numerous developments in Telecommunications in the last three months under the post-monopoly rules. In January British Telecom formed a company in partnership with the city to market ideas development at BT's research laboratories. The company called Matlesham Enterprises, has five shareholders - BT holds 30%, Electra Investments Trust (25), Lazard Brothers (20), Raeburn Investment Trust (20) and Thompson, Clive and Partners (5). In February the BT research laboratories at Martlesham Heath announced that they had sent laser light through a fibre-optic cable stretching for 102 kilometers without booster stations along the route. The light was dispatched at 140 million pulses a second, which means that one signal could carry 2000 telephone calls simultaneously. Mr. Charles May head of the laboratories said that it would take more than two years to advance the laboratory results to the engineering stage of layable cable. However, once this stage is reached the breakthrough would bring substantial economies.

The long standing wrangle between the private enterprise telecommunications network competing with BT, Mercury, the D of I, and Bt was finally settled in February. The Industry Secretary Partick Jenkin issued a licence to the Mercury consortium under the British Telecommunications Act passed last year. Mercury is a £50 million joint venture between Cable and Wireless (40%), BP (40%) and Barclays Merchant Bank (20%). Initially the consortium plans to link seven major business centres in Britain using optical fibre cables laid alongside British Rails tracks, BT has agreed in principle that Mercury will be able to interconnect with the UK public lines but Mercury still have to reach an agreement both finance and technical with BT.

There have been only two newcomers (accepted out of 29 prospective suppliers) that are likely to be authorised to supply ring company phone exchanges once the liberalising of telecommunications reaches that category in 1983. The firms are Mitel, The Canadian company which already has links with BT and the American company Harris. At present BT does not itself supply these large exchanges with more than 100 extensions but has a list of approved suppliers which includes IBM, GEC, Thorn-Ericsson, and they will continue to supply. The two newcomers join four other companies which offer computerised exchanges which are on the old list - Ferranti GTE, ITT Business Systems, Phillips Business Systems and Plessey Office Systems.

The D of I has also written to 1500 companies in the telecommunications industry encouraging them to produce new telephone equipment in competition

with BT. Following liberalisation the D of I has received applications for approval of extension telephones from 22 companies, offering 96 models, all but 2 of which are understood to be overseas suppliers.

In March the Government gave the go-ahead to the BBC to launch two TV channels to be broadcast by satellite direct to the home. One service to be called Window of the World, will offer a mix of programmes from abroad and repeats from BBC1 and BBC2. It will be covered by an supplementary licence fee likely to be levied on anyone buying the receiving equipment needed for satellite broadcasts. The other, which the BBC expects to be the major attraction should include mainly feature films, shown within weeks of their cinema release, together with operas, concerts, other dramatic events, and full length coverage of sporting events. This would be a subscription channel requiring further payment and the broadcast signal would be scrambled so that only subscribers with the decoding facility would be able to pick it up.

Within hours of the announcement the three partners of the £150 million project to provide Britains own communications satellites, set up a joint company United Satellites to man the satellites. The three are BT, British Aerospace and GEC-Marconi.

British Telecom are also expected to play a major role in the country's cabling project, expected to get the government go-ahead later this year.

The slow diffusion of Prestel was one of the reasons for British Telecom cutting its charges for some Prestel users by 90% from £2,500 to £250 per year. The cuts apply to customers using Prestel as a private communications system. BT hopes to make Prestel more competitive with the private networks that are now being installed.

Prestel is also being installed in the Information Technology Centres being opened up around the country. There was also a government approved scheme started in March to make Prestel available free to the general public. Three towns were chosen for the 18 month trial and in Brighton about 9 Prestel machines will be in use.

The Department of Industry has commissioned Communications Studies and Planning, a London consultancy firm to produce a study of the export possibilities of System X.

The government is expected to unveil a second telecommunications bill which will extend the growth of joint ventures between British Telecom and the private sector and allow more private firms to use the BT's cable links and enable private sector links with the new telecommunications satellite.

The Department of Industry is pressing other governments to open their markets to British Telecommunications equipment in the same way as the first British Telecommunication act has opened up the British Telecommunications market to foreign suppliers.

TELECOMS REFERENCES

"Independant Telephone Network for Businesses given official go-ahead"

Jason Crisp F.T. Feb 23 1982

"City puts money on Telecom Inventors"

Guardian, Jan 26 1982

"Telecoms Cable Triumph"

P. Large G. Feb 11, 1982

"British Firms urged to produce new phones"

Rod Chapman g. Feb 17, 1982

"BBC gets go-ahead for two satellites TV Channels"

G. March 5, 1982

"Prestel Service is to come free"

Brighton Leader March 11, 1982

"Second Telecom bill is set up"

Rod Chapman Feb 24, 1982.

(vi) Manufacturing

A report (published in March 1982) "Microprocessors in Industry": What's Happening in Britain" by the Policy Studies Institute revealed that less than half of British manufacturers were using microelectronics in their products or processes or were planning to do so in the future.

The study based on a survey of 1200 manufacturing establishments, showed that there was an enormous variation in microelectronics used between companies, industries and regions. For example, large companies emerge five times more likely to be users than small ones; companies in the electrical engineering sector were three times more likely to be users than companies in the clothing and footwear sector; and the South West had a 50% higher use rate than the West Midlands.

"There are uncomfortably strong reasons for supposing that Industry in Britain has not been adopting microelectronics to the fullest extent possible, and that in consequence it is already tending to fall behind our leading competitors. It could be dangerous to allow this to continue," says the study.

The government seems to be aware of the problems as can be seen in such statements as one made by Kenneth Baker in March. "The choice is stark - automate or liquidate". In April he opened a novel three day exhibition aimed at helping small engineering sub-contractors win back home markets business from foreign competitors. The exhibition called "Can you make it?" - A Challenge to British Industry" included displays from forty nine major British manufacturing companies of products worth \$100 million that they were buying abroad because they could not find competitive UK suppliers. Representatives from almost 2000 suppliers visited the show. It will be some months before the organisers of the show - The London Enterprise Agency, The CBI and the Institute of Purchasing and Supply - know for certain how much business was generated from the show.

There were signs that some sections of British Industry were beginning to respond to the challenge.

Mike Kelly, M.D. of BL Technology said that BL intended to install £1-2 million of robots per year at today's prices and expected production using robots to grow by about 30 per cent a year during the 1980's.

GEC has set up a special group - Factory Automation Schemes Technology (FAST) to develop robotics. In February it was expecting its first three orders for automated factory systems. All of these systems will be for British Factories - one in one of GEC's own factories.

Two of the orders are for flexible manufacturing Systems (FMS) where robots feed parts to machine tools. The other system was robots for point-to-point welding.

As further evidence of its commitment to robotics GEC closed its subsidiary Hall Automation in April and transferred production of robots to its own Factory Automation Centre in Rugby.

Hyster the US forklift truck manufacturing company is considering installing a multi-million pound factory providing computer controlled storage and materials handling systems in Northern Ireland.

British shipbuilders plan to spend £50 million on computer technology over the next few years.

The government British Technology Group (BTG) and Barclays Bank are jointly funding a new computer company in Washington New Town on Tyneside. The deal is a result of the agreement reached between the government and the banks to pick ventures worth backing in microelectronics.

The company Microcomputing Limited is being lent £100,000 from Barclays Bank and BTG is providing a secured loan of £80,000, payable in stages. BTG also has the option of taking a 10% shareholding in the new company later.

Microcomputing will supply consultancy, training and programming services as well as selling microcomputers to business systems.

Finally a plan to create 50 small technology oriented companies and 2000 jobs was announced in March. Five institutes - British Steel Corporation (Industry), The Co-operative Bank, Pilkington Brothers, Sun Life Assurance and Control Data UK - will each subsidise the new enterprise, to be called World Tech Ventures, to the sum of £200,000.

They will operate by setting up businesses in specific communities which have been hit worst by the recession in terms of unemployment such as the North-East, the North-West, Scotland and Wales.

Finance for the businesses is unlikely to come from World Tech Ventures directly

but financial support, management assistance, education and training, marketing advice and help with access to facilities and services would be key features of the strategy.

REFS : "Once made in Britain"

Ray Cobbert G. 24.4.82

"UK based manufacturers fall behind in Electronics"

Guy de Jonquieres F.T. 25.3.82

"Computer Booster" G. 27.1.82

"Top of the market micro computer scheme is unveiled"

Peter Large G. 26.1.82

"Technology Group plans jobs boost"

Tim Dickson F.T. 24.3.82

"Hyster may put automation plant in Antrim"

Raymond Snoddy F.T. 4.3.82

In these sections some references have been abbreviated

F.T. stands for Financial Times

G. stands for the Guardian