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# Prerequisites of Development, the Function and Place of Workers' Inventiveness in a State Establishment in the Light of the Economic Reform

Przesłanki rozwoju, funkcje i miejsce wynalazczości pracowniczej w przedsiębiorstwie państwowym w świetle założeń reformy gospodarczej

Предпосылки развития, функции и место изобретательства на государственном предприятии в свете принципов экономической реформы

## I

The movement of workers' inventiveness as a socio-economic phenomenon was created spontaneously as a result of the social need. At a certain stage of economic development, slight technical and organizational improvements suggested by engineers and workers employed in plants began to acquire greater and greater importance. Inventiveness and rationalization developed in plants were strongly supported by the socialist state, which formulated this movement in the categories of the law. The legal acts binding in this respect covered different technical solutions with the common name of the workers' inventive projects.[1] The notion of the workers' inventiveness is understood as the whole range of technical production in socialized economy as well as the forms of the former's defence. It comprises both inventions with patent capability, utility patterns and rationalizing projects; and both, the activity

[1] S. Buczkowski, Z. K. Nowakowski: *Prawo obrotu uspołecznionego* (*The Rule of the Socialized Circulation*). PWN, Warsaw, p. 338. On the problem of the notions invention — technical innovation, see: F. Budziński: *Wynalazki, patenty i rozwój gospodarczy* (*Inventions, patents and economic development*), „Zeszyty Naukowe Uniwersytetu Jagiellońskiego" 1977, No. 12, p. 33.

carried on in the frameworks of specialized recearch institutions and the mass inventive and rationalizing movement developed in socialized plants.[2] If specialized institutions are dominated by technical solutions possessing features of the invention, the plants are dominated mainly by small technical and organizational improvements of rationalizing chararacter. This is, among other things, a reason of the depreciation of the significance of the inventive movement in plants, expression of various controversial opinions on the subject of the role and the place of this movement in the economy of a plant.[3]

Empirical investigations carried out in the 1960's on the development and the effects of the workers' inventiveness in plants (especially in textile industry of Łódź) impelled some authors to express their sceptical opinions about the significance of this movement in socialist economy. A. Dinter in his paper "Racjonalizacja robotnicza w zakładzie przemysłowym" (Workers' rationalization in industrial plants) quotes the opinions that type classification and automatization of technical devices creates conditions where the rationalizing movement in the present meaning will not find recognition, and even that the habit of rationalization may prove to be harmful for progress and in some cases may result in devastating good machines.[4] Although the author does not support this extreme view, he concludes stating that rationalizing activity has little in common with what's understood as technical advance. According to him, a significant part of inventiveness and labour utilized by rationalizers does not bring the real technical possessions but it only serves the purpose of keeping up the present production. The views of. Z. Bosiakowski were close to that; he claimed that technical progress — being the result of rationalizing movement — cannot be the basis of the development of technology in general, and in the socialist economy in particular.[5]

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[2] T. Szczepanek: *Wynalazczość pracownicza czynnikiem postępu technicznego (The workers' inventiveness as a factor of the technical progress)*. Instytut Wydawniczy CRZZ, Warsaw 1976, p. 3.

[3] T. Szczepanek: *Pracownicze projekty wynalazcze jako czynnik postępu technicznego w przedsiębiorstwie przemysłowym (The workers' inventive projects as a factor of the technical progress in an industrial plant)* [in:] *Wpływ nauki i postępu technicznego na wzrost gospodarczy (The influence of science and technical progress upon the economic development)*. Łódź 1973, pp. 253ff.

[4] A. Dinter: *Racjonalizacja robotnicza w zakładzie przemysłowym (The workers' rationalization in an industrial plant)*. Wrocław — Warsaw — Cracow 1968.

[5] Z. Bosiakowski: *Postęp techniczny i wynalazczość w przedsiębiorstwie przemysłowym (The technical progress and inventiveness in an industrial plant)*. Warsaw 1966, p. 43.

Investigations conducted by other scientist (Solarz, Tulski, Talejko) does not confirm the above opinions. They point out that rationalizers treat the realization of technical progress as the main purpose of their activity, that the adaptation of a new technique to the needs of a given plant and its staff is the principal function of the rationalizing movement.[6]

Despite the controversies signalled above in the appreciation of this phenomenon, the economic practice explicitly points to a big and increasing role of the workers' inventiveness in a plant. In the scale of the whole national economy, the economic effects of the workers' inventiveness significantly influence the speed of the growth of the national revenue. The ratios of the proportion of the savings obtained through the applied inventive projects in the increase of the national revenue remain on the level of 8,5—24,5%,[7] in the years 1961—1970; whereas in the middle 1970's they undergo the lowering down to the level of about 12% as a result of a significant growth of investments in the creation of the national revenue. Another factor which also indicates the growing importance of the workers' inventiveness is the high dynamics of inventive projects suggested and applied in the national economy, which for the years 1960—1980 figures out 332 and 455% respectively. In 1981, as a result of deep socio-economic crisis, there ensued a drop of almost 50% in the inventive projects proposed and applied in the national economy.[8]

The workers' inventiveness and its effects gather a particularly high importance under the present conditions of the national economy. The situation of getting the economy out of the critical state and of simultaneous doing away with numerous results of the crisis burdensome for society, requires the intensification of the methods of production in a plant, the utilization of mainly non-investment factors of the increase of production, engaging the reserves of the productive abilities, saving the material and energetical resources, more rational management of the resources of labour. The fundamental means serving the above purpose are all types of improvements and innovations. This opens out new prospects for the workers' inventiveness in a plant. The same direction is now followed in plants by the economic reform now going on in plants and new mechanisms of stimulating the technical organizational progress and innovative production connected with this reform. These mecha-

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[6] J. Solarz: *Postęp techniczny w przedsiębiorstwie przemysłowym* (*The Technical Progress in an Industrial plant*). Wrocław-Warsaw-Cracow 1972, p. 172.

[7] Szczepanek: op. cit., p. 262.

[8] *Roczniki Statystyczne GUS* 1981, p. 514; 1982, p. 396.

nisms are based on the assumption that the main forces steering in the direction of permanent progress in technology and organizational of production must be initiated in the plant.[9]

However, it needs emphasizing that the economic reform will not bring any instantaneous improvement in the field of the development of the workers' inventiveness in plants. Economic reform is a complex, long-lasting process. In spite of the fact that it is advanced to a significant degree, it still remains in the initial stage of its application. Not all of its mechanisms operate, some function improperly and must be rectified. Even if we assume that the process of the application of the reform will go on according to the laid out plan and assumptions, one should still take the fact into account that the mechanisms of the reform produce the expected effects latest of all in the spheres of investments and technical progress. As proved by economic practice, plants are inclined mainly to obtain temporary achievements and not perspective ones, and they avoid any risk connected with technical progress. Inflational processes and lack of the general balance in the economy stimulate the activity of plants in the same direction.

## II

As is known, the technical progress in a plant comes from a variety of sources. In practice, two types of sources are distinguished: external and internal ones. The former include:

— research work conducted by the Polish Academy of Sciences and institutions of higher education,

— studies concerning new constructions of goods, plastics, new methods of production worked out by research institutes, designing departments, experimental centres,

— foreign studies on new constructions of goods with which the plants are provided in the framework of licences,

— scientific, technical, economic and organizational information provided by specialized centres, general publications and the professional ones,

The internal sources include:

— studies concerning new constructions of goods, plastics, techno-

[9] J. Pajestka, K. Secomski: *Doskonalenie i funkcjonowanie gospodarki w Polsce Ludowej* (*The Perfecting and the Functioning of Economy in the Polish People's Republic*). PWE, Warsaw 1968 p. 48.

logy and organization of production carried out by the sections of the home technical base (for instance, developmental departments in a given institution, laboratories, etc.),

— inventions, utility patterns and improvements in the sphere of the construction of goods and technology of production, as well as improvements in the organization of production and methods of work presented by the workers.

So one may conclude that the technical progress in a given plant is developed mainly by means of two channels: 1) through developmental activity of the units of the technical base, 2) through the workers' inventive and rationalizing activity. The former source of technical progress in a plant falls into definite institutional frameworks. The other — the workers' inventive activity and rationalization is an activity which is, in a sense, a spontaneous one, since to occupy himself with inventive production does not fall into a worker's sphere of duties. This has definite organizational consequences for the growth of the workers' inventiveness. Organization of the workers' inventiveness in a plant requires a specific way of steering the activity of the authors of inventive projects, the utilization of social forms and of a wide set of instruments of socio-economic policy.[10] The conveyors of technical progress in a plant are mainly investments and modernization processes and, to a smaller degree though not always, co-operation with foreign institutions and the workers' inventive and rationalizing projects.

The situation of the workers' inventiveness in the context of the sources and conveyors of technical progress generally presents the place of inventive production in a plant. It points to the fact that the workers' inventiveness is an important but no doubt complementary source and conveyor of the technical advance in a plant,[11] a close definition of this place is possible only when one takes into consideration all the conditions of management in a plant, conditions which are determined by the system of administration. It is so because the range and the methods of utilizing particular sources and conveyors of the technical progress are influenced by the economic mechanism of stimulating the technical progress in a plant.

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10. A similar view is represented by M. Staszków: *Wynalazczość pracownicza w świetle systemu prawnego PRL (The workers' inventiveness in the light of the Polish law system)* (in:) *Kierunki zmian organizacyjnych wynalazczości pracowniczej w świetle reformy gospodarczej (materiały na konferencję TNOiK) (Directions of organizational changes of the workers' inventiveness in the light of the economic reform (materials for the conference of TNOiK)*. Lublin 1983, p. 84.

11 Cf. Bosiakowski: *op. cit.*, p. 43ff.

## III

In the centralistic-directive system of managing the economy, the basic function of a plant is to accomplish the planned tasks set out by the central planner. The situation when the central planner directs the planning tasks and when the executor — the plant, receives them may be treated as a kind of a strategic game consisting in choosing the appropriate methods and means necessary for the plan tasks to be fulfilled. In this system, the plant is interested in accomplishing the minimum planning tasks and the maximum quota of means making the fulfilment of the tasks possible. Such a strategy gives priority to extensive methods of increasing production, it encourages to gather and conceal productive reserves, it gives preference to quantitative and not qualitative effects, it gives rise to waste and uneconomical management, it decreases the effects of management. The system of management presented here does not create any motivation to develop the technical progress and to use different types of innovations in the process of production. As far as the sources and conveyors of the technical progress are concerned, it induces the plant to choose the extreme sources, to use the licences, and it brings about many investments.

The situation is radically different in decentralized system of management with the use of the instruments of the market mechanism, at the realization of which the economic reform aims. The system, as is known, aims at increasing the efficiency of management through: 1) giving a wide sphere of autonomy to the managing board in a plant as regards the current and strategic economic decisions, 2) burdening organs of a plant with the risk resulting from the decision-making, 3) the centre's indirect influence on the essence of decisions made in a plant by creating such economic conditions which enforce effective management. It is supposed that after the in-coming model of management has been introduced and the state of balance has been achieved in the national economy, the methods and the strategy of managing a plant will be significantly changed. In such a system, plants will construct their plans of socio-economic development (short- and long-term ones) independently adjusting their goals and tasks set up to their own abilities and demands of the market. In such conditions, the strategy of the plant's activity assumes a real significance which consists in effective carrying out the lasks outlined in the long-term plan, as it is a condition for the optimum economic plan to be fulfilled to adapt the optimum strategy of activity.[12]

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[12] *Teoria rozwoju gospodarki socjalistycznej* (*The Theory of the Development of the Socialist Economy*) ed. by W. Grzybowski, vol. II, Lublin 1976, pp. 323 ff.

In a parametrical system of management, the fundamental strategic aims of a plant are the following: setting up and realization of long-term tasks in the field of the technical, organizational and economic progress, and striving at achieving economic development.[13]. While constructing plans of socio-economic development, plants must take into consideration different internal changeable factors and external factors and conditions, they must make choices between alternative solutions, they must make temporal arrangements of the tasks to be realized.[14] They must also impose some hierarchy on socio-economic tasks according to the degree of their importance and urgency, and to choose the best strategy enabling the achievement of the intended tasks. This requires high qualifications of the managing staff employed in a given institution and efficient work of all organizational sections of the managing board.

In order to attain the above goals in the parametrical system of management, the plant's interest is both to maximalize tasks and profits, and to minimalize the outlays. As opposed to the previous system, this one encourages a plant to intensify its methods of production, to give priority to qualitative and not quantitative effects, to work out various forms of the technical progress with special regard to improvements and innovations. In such conditions, the technical, organizational and economic progress and the workers' inventiveness connected with it, become significant components of both the general strategy of a plant and of the strategies of particular sections concerning for instance starting a new production, increasing the quality of goods, activization of the sale of goods, etc. However, it should be emphasized that it is not easy to define the place of the workers' inventiveness more exactly on the score of numerous internal and external conditionings of the process of inventiveness. That is why in the following part of the paper attention will be focused on the fundamental functions and more important prerequisites of the workers' inventiveness in a plant.

## IV

The place of the worker's inventiveness in a plant results from the former's substance and function. The workers' inventiveness, innovations are inseparably connected with the plant's activity, with the process of production. It is so because man's labour as a conscious, purpo-

[13] The notion of strategy is referred mainly to long-term activities.

[14] J. Kwejt: *Metody i strategia zarządzania przedsiębiorstwem przemysłowym* (*Methods and Strategy of Managing an Industrial Plant*). PWE, Warsaw 1976, pp. 90 ff.

seful activity contains creative elements. Man, in the course of the process of production, is always conscious of the purpose of his work and the methods leading to the chosen aim, and he strives towards achieving this aim with the least effort. This is the essence of rationalization.

The workers' inventiveness fulfils three basic functions in a plant: technical, economic and social ones. It is the source of the technical, organizational, economic and social progress. The various manifestations of inventive and rationalizing movements reveal fuller the whole complex economic activity of a plant.

First and foremost, the workers' inventiveness is a conveyor of technical and techno-organizational progress. The realization of this function results in improvements in the field of: 1) techniques of production, 2) technology of production, 3) organization of work.[15] Techno-organizational improvements have definite economic repercussions since new solutions ought to be profitable at the same time.[16] The majority of improvements bring measurable economic effects which can be calculated by means of the economic reckoning, which is the main criterion of the application of inventrive projects. This criterion together with the perfection of economic mechanism resulting from the economic reform will assume greater and greater significance. However, besides economic purposefulness and effectiveness, the social purposefulness of the suggested solution must be also taken into consideration. Combination and proper weighing of the two aspects of the estimation is particularly important in making decisions concerning projects whose aim is to increase the safety and reliability of the working of machines and devices.[17] Moreover, the workers' inventiveness brings about many other social advantages which, although incommensurable, are vital for the proper functioning of the plant. Generally, they are connected with the perfecting of the most important factor of production, which man no doubt is. It is in this sense that the workers' inventiveness performs the role of a stimulator of social progress in a plant. Underestimation of this function of the workers' inventiveness gives rise to one-sided evaluation of this phenomenon, which is not favourable for development. In the light of the statute from Sept. 25, 1981 concerning state institutions, the subjects themselves decide upon yearly and many-years' plans of socio-economic

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[15] Similarly B. Miszewski: *Postęp ekonomiczny w gospodarce przemysłowej (The Economic Progress in the Industrial Economy)*. Warsaw 1968, pp. 54 ff.

[16] Cf. K. Wandelt: *Istota i rodzaje postępu technicznego (The essence and types of the technical progress)*. Poznań 1961, p. 59.

[17] B. Pilawski: *Obliczanie efektów ekonomicznych postępu technicznego w przedsiębiorstwie (The Reckoning of Economic Effects of the Technical Progress in a Plant)*. PWE, Warsaw 1970, pp. 89 ff.

development.[18] The unity of the functions discussed and their mutual conditioning should be reflected in the form of the integration of the whole of the undertakings aiming at developing the workers' inventiveness in a plant.

The basic criterion of the estimation of the economic effects of the workers' inventiveness in a plant is no doubt the savings of live and objectified labour accomplished on that score.[19] The main aim of the improvements in the field of techniques of production is to improve the technical parameters of the means of labour and these increase the workers' efficiency, therefore bringing savings of live labour. The technical progress realized thanks to the improvements in technology means the perfecting of the methods of production with the application of the present techniques of production. This type of improvements bring significant savings of objectified labour in a plant. As it is seen in the published statistical data, the savings achieved in Polish economy on that score are significant and show high dynamics. In the years 1972—1978 they increased two and a half times. In 1978 the first place in the structure of economic effects was taken by savings concerning materials and labour (over 60%), then followed the effects achieved owing to the increase of production (over 10%), introduction of new products (approximately 12%) and the improvement of the quality of production (almost 5%).[20] This structure of effects, from the point of view of developmental strategy of a plant and the consumer's interest, is far from being proper; the proportion of effects achieved as a result of the increase of production, introduction of new products, improvement of the quality of production. As it is known, three fundamental phases appear in the strategy of a plant: staying on the market and stabilization, the strengthening of its position, development and expansion.[21] Minimalization of expenditures constitutes to a certain degree a statistical factor in the plant's activity, whereas its development and optimalization of its effects require a greater proportion of dynamic factors which bring maximum incomes. In the present conditions, development and expansion of a plant may be accomplished through increasing the size of production; after the market has been satisfied (when the consumer's market has been created), development and expansion of a plant will be possible only through systematic infusion of new boom in production and the improvement of the

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[18] Dz. U. from 1981, No. 24, item 122.

[19] Cf. J. Gordon: *Zarys ekonomiki postępu technicznego (Outline of the Economics of the Technical Progress)*. Warsaw 1966, p. 170.

[20] The result tables of GUS.

[21] Kwejt: *op. cit.*, p. 230.

quality of products. This process is inseparably connected with the technical progress and innovations.

In the economic practice, we use the efficiency ratio understood as the proportion between the effects achieved and the outlays used in order to reckon the profitability of applied inventive projects.[22] This ratio has reached the value of about 8 zlotys in industry in recent years.[23] Although this is an inaccurate and simplified measure, it confirms the hypothesis that the workers inventiveness is a very profitable form of accomplishing the technical progress in a plant; it makes the intensification of the process of production possible. This has particular importance for the period when Polish economy is coming out of the economic crisis; it will not lose its significance in the future.

## V

As has already been pointed out, the growth of the workers' inventiveness in a plant is conditioned by a variety of internal and external factors. These factors may be divided into three groups: techno-productive, economic, organizational and social ones.

In the first group, the growth of the workers' inventiveness is influenced by the factors which condition the strategy of the development of the plant. These include: 1) fundamental transformation of the volume of production so that it should bring about a significant increase of home costs, improvement of the quality of products enabling to win the market and further growth of production, 2) systematic modernization of products, introduction of new assortments which may be located both on home and foreign markets in this way bringing raw materials and materials necessary for the production of those articles, 3) trend towards achieving the minimum production.[24] Investigations on the inventive production prove that frequent changes in the structure of production, techniques and technology of products are favourable for the inventive activity in a plant. The longer a given article is produced in an unchanged form, the more exploitation it undergoes as far as inventiveness is concerned, and therefore possibilities to improve the construction of products and technology of production are getting smaller. And vice versa, frequent introduction of new products or ones which are significantly

[22] W. Spuch: *Ekonomiczna analiza efektywności postępu technicznego w przedsiębiorstwie przemysłowym* (*Economic Analysis of the Efficiency of the Technical Progress in an Industrial Plant*). PWE, Warsaw 1967.

[23] The result tables of GUS.

[24] Kwejt: *op. cit.*, p. 241.

modernized, creates possibilities for their further improvements. This phenomenon defined as diminution or enlargement of the "inventive material" has a significant influence on the size and effects of the workers inventiveness in a plant. Here, one can notice the following regularities:

1) number of presented and applied inventive projects and effects achieved thanks to their application are growing with the enlargement of the "inventive substance" — introducing new products.

2) the amount of effects falling to one realized project gets smaller after a new product has been introduced because submitting simple projects will lower the technical value; however, the increasing number of presented and applied projects compensates their worse technical value, giving rise to a significant increase of effects on the global scale,

3) economic efficiency of applied inventive projects grows after introducing a new product as a result of a great number of simple projects which can be duplicated in great quantities and which require relatively small outlays to be applied. There also exists a causation between the size and dynamics of production and the effects of the workers' inventiveness. It has a twofold character. Increase of production has a positive influence on the increase of the effects of inventiveness, whereas increase of the effects of inventiveness (for example reduction of a product's labour consumption in the case of narrow bottle-necks in production) results in the increase of production.

That these regularities do occur in economy is confirmed by the drop of interest in the workers' inventiveness in plants in the period of the economic crisis. On this basis one can anticipate increase of the significance of this movement in a plant in the phase of getting the economy out of the crisis and in the phase of making production more dynamic. However, it should be stressed that stimulators of the growth of the workers' inventiveness reveal their full power of influence only after the national economy has achieved the state of general balance.

## VI

Among the economic factors influencing the development of the workers' inventiveness in a plant, an important place is occupied by: 1) the size of financial outlays and the principles of the former's assignation, 2) level of salaries meant for the authors, 3) economic mechanism of the functioning of the plant which stimulates or stunts the development of the technical progress and innovations.

The statistical data point out that the overwhelming part is made

up of outlays appropriated for salaries for the authors of inventions (40—80%). This is a consequence of the fact that live labour constitutes the major part of the process of creating inventions and improvements. The high proportion of salaries for the authors of inventions in the financial outlays meant for the workers' inventiveness results also from high effects which constitute the foundation of establishing the amount of salaries meant for the authors and of the application of simple solutions whose realization requires relatively small financial outlays in production.[25] It should be stated that the previous system of stimuli encouraged to employ simple projects the application of which did not require high outlays. This type of projects did not engage excessive circulating means of the plant, they did not bring about any disturbances in the work of productive departments and did not engage any more workers. At present, this situation should be gradually improving since plants have got a significant autonomy in the disposal of the financial means for development, and the new economic mechanism inclined them to choose optimum technical solutions. However, it should be emphasized that the binding principles of financing the technical progress in plants do not foster the development of the workers' inventiveness. The inclusion of the costs of introductory operations and of the realization of inventive projects into the bulk of general costs reduces the plant's profits and constitutes a kind of anti-stimulus for the technical progress. Therefore, we should admit the pertinence of a suggestion to lessen taxes imposed on the sums of money meant for research work and the technical progress in plants.[26]

It is obvious that increase of the outlays for the workers' inventiveness does not always bring about proportional growth of effects. This results from the specific character of inventive production and from the fact that the funds laid out for this purpose may bring tardy effects. The financing of the inventive production has an element of risk which is, however, made up for by high economic efficiency of the applied inventive projects.

Freedom of disposing of money in a plant refers to the establishing

[25] U. Wojciechowska: *Finansowanie postępu technicznego (Financing the Technical Progress)*. Warsaw 1964, pp. 33 ff.

[26] A. Szajkowski: *Udział innowacji technicznych w podnoszeniu ekonomicznych efektów gospodarowania przedsiębiorstwa państwowego (The proportion of technical innovations in the increase of economic effects of managing a state plant)* [in:] *Prawno-ekonomiczne warunki działania przedsiębiorstw państwowych w okresie wdrażania reformy gospodarczej (materiały na konferencję TNOiK) (Legal and economic conditions of the activity of state plants in the period of the application of the economic reform (materials for the conference of TNOiK)*. Lublin 1983, p. 109.

of the amount of salaries for authors of inventive projects to a greater and greater extent. One can observe the process whereby the reckoning and paying salaries are becoming less formal and their upper limit is rising.[27] One is justified in supposing that with the growth of the efficiency of the economic instruments of the reform, the legislator will give up the legal regulation of the salaries of the authors of inventions, leaving those matters within the province of a given institution. In the group of economic factors, results of the workers' inventiveness are most influenced by the economic mechanism of the functioning of economic organizations, especially that part which determines the plant's absorptiveness for innovations. J. Mujżel enumerates the following elements of the economic mechanism which should induce plants to investigations: 1) system of central planning, 2) organizational structures and ties between economic units, 3) motivational system, 4) system of prices for innovations, 5) system of the financing of innovations. All these elements of the economic mechanism of the functioning of a plant ought to stimulate development of the technical thought and the application of the latter's results. These stimulators should include all subjects participating in the development of the technical progress in a plant: workers employed in the departments of the technical base, the plant's board of directors and the staff; they should influence the managers of the institution in a stronger way than do the checks resulting from the risk connected with the technical progress.[28] Such conditions should be created in the future by the competition issuing from the assumptions of the applied economic reform and by the redressing of general balance in economy

## VII

A significant place in the group of organizational factors influencing the growth of the workers' inventiveness is taken by the organizational structure of economic units. A great majority of innovations require the co-operation of economic units. Therefore, it is necessary to create such organizational bonds which would induce a plant to co-operate with

[27] Cf. the statute of the Prime Minister from August 25, 1982 concerning the problem of announcing a uniform text of the statute of the Cabinet from December 11, 1972 on inventive projects, Dz. U. No. 28, item 200.

[28] J. Mujżel: *Procesy innowacyjne i ich mechanizm ekonomiczny w gospodarce polskiej (Innovative processes and their economic mechanism in Polish economy)* [in:] *Innowacje w przemyśle (Innovations in industry)* ed. by J. Mujżel and K. Poznański, PWE, Warsaw 1981, pp. 49ff.

other subjects in the creation and application of techno-organizational innovations. This postulate assumes special importance in market economy where the rivalling institutions may be interested in concealing the technical achievements. In the new conditions, the type of negative attitudes will not be eliminated by means of imposing an administrative obligation of spreading the technical progress on plants, but by means of creating adequate organizational ties and conditions for partnership issuing from material stimuli.

The problem discussed here is considerably influenced by such features of the organizational structure as: size of economic organizations, principles of grouping in larger organisms, elasticity of the organizational structure increasing the capacities of adaptation.[29] It should be emphasized that already now, the plants enjoy a wide autonomy enabling them to choose the optimum organizational solution for development of the technical progress. These, however, cannot be permanent, universal solutions, possible to be duplicated in other organizational units, but ones which would be constantly perfected and adjusted to the character of the institution and the latter's specific conditions of functioning. As for organizational solutions within the institution, the variety of factors determining the innovative processes point only to the necessity of closer integration of the activity of all organizational sections dealing with the problem of inventive production.

The growth of the workers' inventiveness in a plant is considerably influenced by a set of organizational factors creating a favourable atmosphere for engaging oneself in inventive production. Here, one should include the following: 1) competent work of organizational sections which direct the development of the inventive movement and which attend to the authors of inventions in institutions, 2) creating a favourable atmosphere furthering the creative activation of the workers, 3) adequate application of the system of ideological and moral stimuli inducing the authors to undertake the inventive production, 4) raising the level of the technical knowledge and productive experience of workers, 5) enabling the authors of inventions the access to scientific and technical information, 6) inspiring the authors to undertake proper objects for inventions from the point of view of the needs of a given institution. As far as this group of factors is concerned, new principles of the functioning of institutions should create favourable conditions for the integration of efforts of the management of the institution and its staff

[29] Cf. L. Balcerowicz: *Struktura organizacyjna gospodarki narodowej a postęp techniczny (The organizational structure of the national economy and the technical progress)*. „Ekonomista" 1979, No. 7 p. 1312.

around the accomplishment of commonly fixed aims. However, it is imperative that the set of these undertakings should be reflected in the plans of the development of the technical progress in the institution.

## VIII

Out of the group of social factors influencing increase of the workers' inventiveness in a plant, one should pay special attention to those activities which are connected with the growth of man's role in the process of production. Here, one should include the undertakings which go in the direction of professional and social activation of the workers, improvement of the security and hygiene of work and of social and living conditions of the staff, integration with the institution, the strengthening of ties between the management and the staff, the deepening of the process of the humanization of labour. It is also vital for the problem discussed here to build up the workers' conviction that they are the real subjects of the process of production and that they are joint managers of the institution with equal responsibility for its economic situation. Such a conviction is of vital importance as it eliminates a negative phenomenon defined by classics of Marxism as the alienation of labour.[30] It should be stressed that these attitudes are not created in the workers' consciousness spontaneously, but they must be created by means of the whole complex of instruments and institutional solutions. This purpose is served, among other things, by developing the workers' interest in innovative production and their participation in managing the institution.

The greatest role in this group of factors is therefore played by man — the staff of the institution, the former's professional and social structure, especially such structural elements as: education, qualifications, time of employment, age, sex, etc. Investigations on the structure of the authors of inventive projects point out that the above features are significant for the size and effects of the workers' inventiveness in the institution. Therefore, B. Minc is right in claiming that the degree of practical utilization of productive capabilities and qualifications of man power determines the process of economic growth.[31] A similar attitude was taken by O. Lange, who stressed the importance of psycho-

[30] K. Marks, F. Engels: *Dzieła* (*Works*). Vol. III, K and W, Warsaw 1963, p. 627.

[31] B. Minc: *Zarys systemu ekonomii politycznej* (*Outline of the system of political economy*). Warsaw 1970, p. 580.

logical motivation among workers in the socialist production.[32] It is especially in the present stage of the development of Polish economy that economic goals may be carried out only together with social ones. The workers' inventiveness is one of the instruments of integrating both of these goals in an institution.

## IX

The above considerations point out that the present economic situation and the reform of the system of management now going on, are fovourable for the development of innovative processes and the rise of the role of the workers' inventiveness in a plant. Nevertheless, the new economic mechanisms will not solve spontaneously and immediately all complex problems connected with the development of the workers' inventiveness in a plant. Improvement in this field will go on gradually with the perfecting and strengthening of new mechanisms of management. Considerations included in this paper are of model character, that is to say, they are founded on incoming mechanism of the present economic reform and on this basis they point out prospects of developing the workers inventiveness in a plant.

In planned economy, the technical progress and innovative processes in a plant connected with the former may not proceed spontaneously, but they must be steered by the centre with the help of instruments of socio-economic policy. This purpose should be served by current and perspective policy of developing the technical progress resulting from long-term strategy of the growth of the national economy. Such policy composes basis for the constructing of programmes of technical advance and innovative processes in a plant.

Place and role of the workers' inventiveness in a plant is considerably changed in a parametrical system of management. The shift of a part of decisions of strategic character from the centre to the plant will increase the role of those economic subjects in the planning of developmental dynamics and technical advance. Since the role and place of the workers' inventiveness in a plant determine a great deal of various internal and external factors, it is necessary to conduct systematic empirical research aiming at knowing the former better and choosing the optimum techno-organizational solutions.

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[32] O. Lange: *Pisma ekonomiczne i społeczne 1930—1960 (Economic and social writings 1930—1960)*. Warsaw 1961, p. 411.

## STRESZCZENIE

Celem artykułu jest ukazanie przesłanek rozwoju, funkcji i miejsca wynalazczości pracowniczej w przedsiębiorstwie państwowym w świetle założeń reformy gospodarczej. W części wstępnej artykułu omówiono podstawowe pojęcia z zakresu wynalazczości pracowniczej oraz znaczenie postępu technicznego dla wychodzenia gospodarki z kryzysu gospodarczego. W dalszej części omówiono źródła i nośniki postępu technicznego, uznając przedsiębiorstwo za główny podmiot rozwoju postępu technicznego. Określając znaczenie i wartość różnych systemów zarządzania z punktu widzenia stymulowania postępu technicznego w przedsiębiorstwie, zdecydowanie opowiedziano się za parametrycznym systemem zarządzania. Miejsce wynalazczości pracowniczej w przedsiębiorstwie państwowym zdeterminowane jest różnorodnymi czynnikami. Niemałe znaczenie dla jej rozwoju mają funkcje wynalazczości pracowniczej w przedsiębiorstwie. Istotne znaczenie dla rozwoju wynalazczości pracowniczej w przedsiębiorstwie mają różnorodne uwarunkowania wewnętrzne i zewnętrzne o charakterze techniczno-produkcyjnym, ekonomicznym, organizacyjnym i społecznym. Dominuje teza, iż najważniejszym czynnikiem w procesie innowacji jest człowiek, jego twórcze zaangażowanie. Analiza uwarunkowań procesu innowacji w przedsiębiorstwie pozwoliła sformułować wnioski, które mają istotne znaczenie dla powodzenia reformy gospodarczej.



## РЕЗЮМЕ

Цель статьи — показать предпосылки развития, функции и места изобретательства работников государственных предприятий в свете принципов экономической реформы. Во вступительной части обсуждены основные понятия из области изобретательства и значение технического прогресса для преодоления экономического кризиса. В дальнейшей части рассмотрены источники и носители технического прогресса, с учетом предприятия как главного субъекта развития технического прогресса. Определяя значение и ценность различных систем управления с точки зрения стимулирования технического прогресса на предприятии, автор решительно высказывается за параметрическую систему управления. Место изобретательства на государственном предприятии обусловлено многими факторами. Немаловажны здесь его функции на предприятии: существенное значение для его развития имеют различные внешние и внутренние условия производственно-технического, экономического, организационного и общественного характера. Главным фактором в процессе нововведений является человек, его творческая активность. Анализ факторов, обусловливающих процесс нововведений на предприятии, позволил сформулировать выводы, имеющие существенное значение для успеха экономической реформы.