FESTIVE SPEECH OF RECTOR KÁROLY POLINSZKY AT THE BICENTENARY CELEBRATION OF THE TECHNICAL UNIVERSITY BUDAPEST

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200 years have passed since the Institutum Geometrico-Hydrotechnicum was founded within the University of Buda by the edict of Joseph II issued on August 30, 1782. This is how he motivated this measure: "If the studies of geometry, hydrotechnics and mechanics are highly necessary in general, this is particularly the case in the Hungarian Kingdom and its annexed provinces, where — namely after the wars and vicissitudes of the past centuries — the conditions of land property are in great confusion; whole tracts of land are under water and turning into marshland; milldams are in a bad state; most public roads are neglected. The need for teaching these sciences is obvious..."

The motivation proves that the foundation, two centuries ago, of the Institute of Engineering was by no means some improvised deed, no sudden flare, but a conscientiously prepared, deliberate action, a consequence of the concept of civil service in enlightened despotism.

However, difficult periods followed the first decade of the Institute's life, since never was Hungary as far behind the general European level in sciences than in the first and second quarters of the 19th century. The country was isolated from abroad. It was only with great difficulties or not at all that gifted young men eager to learn were allowed to study abroad, for fear that they bring dangerous political ideas back with them. Books printed abroad were subjected to strictest censorship. Bolyai, for instance, had to wait 19 years till he finally received one of Gauss's mathematical works from Göttingen.

Under such circumstances the level of teaching rapidly deteriorated at the University of Pest, and it was just at the science departments the lowest. University institutes declined, and — with a few exceptions only — the departments were headed by an overaged professorial staff. The Class of Mathematics and Sciences of the Hungarian Academy of Sciences had as little as six ordinary members among the scientists residing in the capital, and even as late as 1840 only one ordinary membership was occupied by a scientist working in industry.

Not only in science, but in all regions of life backwardness was enormous, compared to the Western countries fully engaged in industrialization and

bourgeois development. On the other hand it was, however, the period of revival, the verge of changing into bourgeois society. The intellectual elite was dominated by the desire for reforms, vitalized by the hope in a better future. The nation could not, however, expect much from the government regarding reforms. The activities of the outstanding personalities of the period were therefore based mainly on society. Széchenyi not only started, but partly also completed his grand works; Földváry established the National Theatre; Fáy founded the First Hungarian Savings-Bank; Kossuth brought the Chamber of Industry and Batthyány the Chamber of Agriculture into life.

The totality of society was involved in these reforms, similarly to those in Joseph II's time, with the essential difference, however, that the reforms were not initiated from above, but from below, and that it was not the modernization of public administration that stood in their centre, but progress in material production, application of the results achieved in the industrial revolution. Quite evidently the need for engineers trained in the various branches of industry arose, engineers differing from the civil engineers trained in the Institutum Geometricum.

The demand for the organization of a separate university of technology arose in the 'thirties of the past century. A royal decree dated April 29, 1836 apprised the Diet that took the initiative in this question: the King considers it his royal privilege to provide for the establishment of a technological university as soon as circumstances will allow it; no bill is needed. The Diet, however remained active in this point and its endeavours were crowned with half success: a royal edict signed June 20, 1844 pronounced the foundation of an industrial training school and not of a university. It was inaugurated on November 1, 1846. At that stage the Institutum Geometricum of the University of Pest was not united with this school; the union took place in 1850 only, in the bitter years following the defeat of the War of Independence. It could thus happen that when the union took place, the authorities "forgot" to grant the right of issuing engineers' diplomas to the institution. Up to the Austro-Hungarian Compromise, that is, for almost two decades no qualifying examinations were held and no engineers' diplomas were granted in Hungary. It was by no means incidental that the migration of Hungarian youth to universities of technology abroad in the 'fifties and lasted until the beginning of the 'eighties.

Public opinion was scarcely aware of the fact that by uniting the Industrial School and the Institutum Geometricum, the Polytechnic had finally been established in Hungary. It was, however, well-known that if a family wished to train its son into an engineer, he should be sent to Zurich. The professorial staff of the Polytechnic gave no signs of life for a long time; it made no proposals, it did not come forward with requests. It observed silence and continued to serve. Not that the professors had been indifferent towards the

institution: they were deeply devoted to it. The reason for silence was the autocratic Austrian rule over Hungary for two decades.

Five years had to pass after the Austro-Hungarian Compromise of 1867 till the Joseph Technical University obtained the right to hold qualifying examinations, until formal graduation questions were regulated, curricula were established and autonomy was granted. The institution functioning up till then under most miserable conditions in Buda was moved to Pest. The model that the professorial staff set to itself for organization was the Technische Hochschule in Zurich. Further ten years' work was still needed to develop the new institution under the new conditions into a true technical university.

The long struggle, the prehistory of our university ended in 1882. In its subsequent development it gave proof by the brilliant results achieved of the gratitude to those who had fought for one century to bring it to existence.

100 years had to pass until a technical university finally came to life in the capital of Hungary, a university suitable to occupy an eminent place among similar institutions abroad regarding organization and equipment as well as scientific and economical effectiveness.

The first period of the second hundred years ended in the years of World War I. This period of three and a half decades was the "golden age" of our institution, characterized by distinguished, inspiring, creative-minded professors and their co-operation with the rising young generation keen to study. An outstanding example for the period is Donát Bánki the professor and Tódor (Theodor) Kármán the pupil. I cite this example, because Tódor Kármán, honorary doctor of our university, dedicated a whole chapter to his university years in his autobiography. This chapter eminently characterizes the internal life of our institution at this flowering period. It was then that it succeeded to bring into a synthesis the scientific attitude of the Institutum Geometricum and the professional training followed by the Industrial School and an optimum blend of the curricular discipline of the first years and the academic freedom of the universities of the 19th century was found.

The second period of our University's second centenary covers the time between the two World Wars. Though basic changes took place in science and technology, there was no need to change the concept of engineer education: the dialectics of scientific education and professional training reigned over this period too, which we may therefore consider the after-life of the "golden age". Personal conditions also confirm this association, since the departments were headed by professors who were educated at our university in the previous period, who were assistants beside the great personalities of that time. The busts of the most outstanding ones are here around us in this assembly hall, among them — will you allow me a subjective remark in this festive moment — just across me the busts of the two scientists who educated me into a chemical engineer: József Varga and Géza Zemplén.

Towards the end of this period a certain extent of moderate approach towards industry may be observed. The Department of Nuclear Physics was organised by Zoltán Bay with the financial aid of Tungsram Ltd., the Department of Textile Chemistry, the present Department of Organic Chemical Technology by Zoltán Csürös with the support of Goldberger Textile Co. The University, at this stage, became more willing than earlier to establish relationships with industry.

In those years many hundreds of engineers who graduated at our institution later followed their career abroad, and the world was able to assess the qualities of the Technical University Budapest by their achievements. The grave contradictions in Hungarian society between the two World Wars seriously impeded progress, above all the disproportionate development in the different branches of economy, which was sharply reflected in the departments of our university too, and on the other hand the basic class-antagonism which manifested itself in the social structure of the students too.

The third period of our university's second centenary started with the end of World War II and the Liberation of Hungary. The reconstruction of the destroyed Technical University required heroic work. Many of us remember the disastrous picture that met us. The buildings were in ruins. And in spite of this state, the study year was started in the spring of 1945. The university, *universitas magistrorum scholarium*, was not paralyzed, on the contrary: among the ruins everybody went to work most actively and enthusiastically, with confidence in a healthier future. The participants of the reconstruction work were sometimes exhausted and worn-out; yet we remember those years as the happy, impassioned time of rebirth.

Reconstruction took three years. This interval was needed to normalize things; it required much flexibility and adaptability, and its mode and manner had to be found locally. The strategy of economically active action was successfully put on trial by our institution.

The fourth started with the establishment of the National Technical College and with the University Reform of 1948. It continues to the present, but is by now close to its end. The period, rich in experiences, is characterized by large-scale development. Its basic feature is that the Technical University changed into the technical university of the socialist Hungary in all respects, in its concept, its spirit and its structure. The path was by far not easy, nor exempt from errors, nor do we live at the present stage free from worries. This path has been analyzed and valuated by facts and numerical data in many reports issued on the occasion of the bicentennial anniversary. Let me abstain from repeating them. What I should like to stress is that in teaching, in research and scientific achievements our university competed successfully on an international basis.

We have now arrived to the present, and have to formulate the new objectives and new trends of development. Or rather, I have to say that the 'eighties appear to be the frame for the beginning of a new era.

It would be an attractive simplification to refer to the scientific and technological revolution, to accelerated progress in technology, and to technology leading at present into the domain of large complex systems ruling over agriculture, health service and administration. All this is true, of course, but it does not yield the answer. The true motive force in the new era of our institution does not lie in the dazing results of science and technology, but in the challenges to us as citizens of socialist Hungary and citizens of the Technical University Budapest.

I mentioned challenges, meaning that our people, our nation, and life itself set us a new task, to comply with the actual problems of the present. The bicentennial of our university fell into a period when stagnation or recession of national economies is apparent almost all over the world, many countries fight with financial troubles, inflation and open or latent unemployment. The phenomenon is complex, it cannot be reduced to a single cause. By and large, the explanation may be found in the present divided socio-economic structure of the world, but fully satisfactory scientific explanations are not at hand. In the meanwhile, governments have to react by positive actions to the disorders of equilibrium that endanger the stability of society.

Even though to a different extent and in different aspects than in other countries, the worries and troubles have reached our national economy too. Party resolutions and government decisions have been brought to conquer the difficulties. Under such circumstances it is the eminent duty of our university to educate engineers capable of participating in the transition of the national economy from extensive to intensive development, in the renewal of its structure to make it able to hold ground in world competition. Our national economy needs creative young engineers capable of innovation, well-trained both theoretically and in practical skills and ready to continue learning all their life. To attain this objective, the system of education must also be renewed: more appreciation must be ensured for those attempting to achieve more, experimenting with novel paths. On the other hand, the university should directly promote that national economy enter novel paths, and this activity should be much wider than our institution did in the past with research and services.

I have mentioned that the slogan for our institution in the period of autocracy, between 1850 and 1870 was "keep silent and continue to serve". Today it is exactly the contrary that we must follow: national interest, national consent — similarly to the years following the Liberation — demand the strategy of active deeds.

The second challenge is also a world-wide phenomenon: the crisis of educational systems. The question is put to us in this shape: is a university whose organization, mechanism of action, methodology of teaching, internal disposition is essentially the product of the second half of the 19th century suitable at all to educate intellectuals who will be active partly or wholly in the 21st century? It is not the competence of universities as specialist-training and research institutions that is made questionable; however, both the concept and the methods have been rated conservative for educating the intelligentsia of the 21st century.

The resolutions of the Political Bureau and the Cabinet passed in 1981 have made it clear what the demands formulated by the present socio-economic environment towards our university are. To satisfy them is by no means easy. If anyone conscientiously starts to describe the university model consistent with the requirements from all viewpoints, from the views of teaching, education, research, maintenance, organization, he will very soon find out that in most respects this model will not resemble the actual situation.

What we can rely on when seeking a path for the future university is, on the one hand, international experience, and on the other hand, our own experience, the heritage of the past 200 years. The heritage I have in mind here does not consist of the building and equipment, the nuclear training reactor and the swimming-pool, the text-books and lecture notes. Heritage is not necessarily palpable. Yet it is vital. Our most valuable heritage is the mode how to educate youth into true engineers. The answer is simple, but difficult to put into practice. Good engineers must be educated by professional training and by teaching sciences. The history of our institution in its past hundred years demonstrated that work was successful when the university found the right proportion between them and the right methods, fitting the actual stage of development.

Let me finally pass to a third challenge: the adaptation of our youth into society. This is also a universal phenomenon, insofar as it is connected with the present confusion in world economy. It is, however, to a much greater extent a national problem, since adaptation problems originate almost entirely from domestic conditions and hence their solution relies on us. Let me cite some of the major problems: the many contradictions in starting a career and finding a suitable job; the handicaps of young engineers in both material and moral recognition; slow promotion at the place of employment and little opportunity in getting true engineering tasks; the difficulties in acquiring an independent flat. These are general problems; however, here at the Technical University Budapest we have to face them in the context of the young engineers who were our students and who graduated at our university. Facing these problems is not simply a humanitarian duty: it is our professional, moral and political responsibility, since our institution has to educate intellectuals, who — besides

performing the tasks of their profession — are active participants in forming social relations, who are capable of orientation in the matters of the world, who fulfil an important part in formation of socialist consciousness. The entire university must firmly continue on the path to become a model field of such intellectual activity. I can scarcely imagine a more inspiring task for the youth organization of our institution than the acceleration of this political process.

I have discussed three problem complexes among the challenges of our age; these are the ones to which we now must give a concerted reply, at the stage when we pass into the third century of Hungarian engineering education. I am certain that we all agree: the answer is defined by the essence of our socialist system, since the university is an organic part of society. All efforts — better utilization of the capacities of engineers, higher exaction of industry, solution of accomodation problems, participation of research institutes and industrial enterprises in teaching and educational work, etc. — can only be solved in conjunction with society, at the same time acknowledging and declaring that the mode and manner of satisfying demands and tasks set by society must be found within the authority of the *universitas magistrorum et scholarium.*

In the years following the Liberation, our university has already assayed the strategy of acting. The example has been set. We do not wish to copy it but to apply it in the new situtation by new methods to satisfy new demands. And this is not only a possibility, but a duty to us. We are obliged by the sacrifices of our people brought in the course of 200 years to establish and develop Hungarian engineering. We are obliged by our renowned — some of them celebrated world-wide — predecessors. And we are obliged by all that our bicentennial institution gave to Hungary.