

# INTERRELATION BETWEEN MANPOWER NEEDS AND PLANNING THE DEVELOPMENT OF THE EDUCATIONAL SYSTEM\*

By

J. TIMÁR

It is a characteristic feature of our century, which, from the point of view of productive forces, might be justly called a century of science and technics, that the significance of qualified labour is in every field of social activity permanently increasing on a world scale and at an accelerated rate. The demand for specialists with university and similar qualification is particularly rapidly growing. Their education is the task of institutions of higher education. Thus the needs for specialists of higher qualification considerably determine the degree and rate of development of institutions of higher education as well as its structure. The basis and starting point, therefore, of planning universities, colleges and other institutions of higher education, is the national economic plan for covering qualified manpower needs. With a view to the training time for higher education, further the duration of secondary schooling as a basis of higher studies, and the time required for establishing new capacities for higher education, the securing of a planned development requires *that the qualified manpower needs of the national economy and, parallel to that, the development of higher education be planned over a vista of 15—20 years.*

In the socialist countries the elaboration of the twenty-year national-economic plans is in progress. Under this plan, the first variant of long-term qualified manpower needs has been recently prepared and based upon that the detailed planning of the long-term educational development is under way. Making use of the experiences gained in the course of these efforts we wish to point out some essential interrelations between manpower needs and the development of the educational system.

\* Between October 19—24, 1962, specialists engaged in the planning of higher education of 16 countries discussed at a conference held on the initiative of the UNESCO the problems of planning the demand for highly qualified manpower and the development of education. This study contains the lecture of the author read at the conference on behalf of the Hungarian delegation.

## 1. Initial assumptions of the analysis

It is a rather widely accepted opinion that filling in the gaps already manifest, as regards qualified manpower and meeting the quickly growing demands in this field depends only on increasing investments for higher education and on securing the highly qualified teachers needed, as an adequately qualified and educated population suited for continuation studies, is generally amply available. In reality, however, investments and an educational staff, though of prime importance, are, in themselves, by no means a satisfactory condition of developing institutions of higher education in a degree to properly meet the future demands of the national economy for qualified manpower. To extend the system of higher education, to draw up development plans, it must further be examined whether it is possible to train the great number of qualified manpower needed, considering the mental capacity of the population from the point of view of continuation studies in a given period. *The number of persons desirous to achieve a defined educational standard and at the same time mentally fit for it, represents in a given perspective also the upper limit of developing higher education.*<sup>1</sup>

This correlation has remained up to now mostly hidden as, especially at the former lower level of socio-economic development, but partly also in the past one or two decades, the demand for qualified manpower was relatively low in every country. In Hungary, for instance, in the capitalist system before 1945, only about 15—20 per cent of an age group entering the working age had acquired some kind of qualification (including lower-grade training) of which the highly qualified ones reached only about 2 per cent. In the perspective of the twenty-year plan the ratio of those acquiring skills should reach — according to preliminary calculations — about 70 per cent of which highly qualified specialists should be over 20 per cent. Among skilled manpower the number of those graduating from institutions of higher education will grow at a more than average rate, which again increases quantitative and qualitative requirements raised against the whole of the educational system. The importance of higher education is coming especially into the limelight in Hungary in the period we are facing by the reform of public education which — as we shall touch upon it later — relegates in the future also the training of technicians to the domain of higher education.

Starting from these thoughts, we wish to give account in the following of the complex analytic method that *presents the quantitative and qualitative*

<sup>1</sup> This correlation, at the same time, determines the maximum staff number of qualified manpower in the national economy to be reached at a given date. This enables us to check up, to some extent, on the long-term plans of qualified manpower needs, especially on the plan relating to the demand for engineers and technicians. In the frames of this paper, however, we do not degress upon these questions, neither do we touch, in general, upon the methodological problems of planning for qualified manpower.

*interrelations between skilled manpower needs and the educational system through a model comprising the continuation studies, vocational training and entering the labour force of an age group of average strength and which, on basis of the model, renders it possible to develop a concept about the tendencies in education, in accordance with the plan for manpower needs.*

For the sake of a clearer demonstration, we are going to present our method by using the concrete example of the Hungarian planning procedure for the period of the twenty years between 1960 and 1980.

In the course of our investigations we shall use the following simplifications and assumptions. Above all, we disregard in the first phase of planning, the need for analysing the problems of the period till 1975. We assume that the staff of qualified manpower planned for that year will be in some way made available for the national economy. Therefore, the planned increase of manpower for the period 1975—1980 and the additional manpower demand of the same period (caused by deaths, retirement, persons leaving their occupation, etc.), i.e. the total demand for new qualified manpower determine to what extent the "output capacity" of institutions of higher education should be developed in the last period of the twenty-year plan.

In this respect, the upper limit of developing higher education — beside the possibilities of meeting investment requirements and the demand for vocational teachers — is also restricted by the number of pupils leaving secondary schools in the given period who are mentally capable of successfully completing higher studies and, whose circumstances also permit it, are willing to complete them. For this very reason, in the first stage of analysis meant to clear up basic relations, it is possible to disregard the future forms of education and also how the ratio among students learning in day-courses, or learning parallel with their work or combined with their work will develop. At the beginning of the plan period, namely, from those who had passed their final examinations in the secondary schools about 1960, nearly everyone will be over 30 years of age and many of them will approach 40. Of this group, those who will not have acquired a higher qualification by 1975, can, with a few exceptions hardly be taken into account as would-be students in the scope of higher education, after 1975. Those however who will learn beside working will be needed without exception if the figures computed for 1975 are to be reached. It will also be necessary that of all the secondary school students now learning those whose intellectual powers qualify them for it, should continue their studies in the scope of higher education. Should some of these apply for admission to the institutions of higher education only after 1975 their training would only make up for the lags in the staff planned for 1975, the fulfilment of which we have taken as a fact anyway. Therefore, in computations relating to the post-1975 period, from the point of view of highly qualified manpower supply for the national economy and of planning the development of higher education,

it will suffice to take into account only the generations of young people that might be drawn into the scope of education.

Evidently, all that by far does not mean to say that after 1975 in universities, colleges, etc., only day-courses will be held for the young people. It is sure, however, that in the perspective of 15 years in other courses (night, correspondence, or other forms of education combined with work), too, predominantly such students will participate who will have finished their secondary school studies at the utmost only a few years before 1975 and continue their higher studies after 1975 alongside work. At the same time, part of those who will have finished secondary school between 1975 and 1980, will not continue their studies immediately but will take jobs and will continue their studies two, three or five years later. These intricate movements in the continuation of studies of the population of an age group might, however, because of the aims of and methods used in our investigation, be disregarded.<sup>2</sup>

*From the foregoing it follows that the immediate objective of our investigation is to establish what requirements are raised by the planned number of specialists with higher education — (to be reached at the end of the twenty-year plan period in 1980) — against higher education and beyond that against the quantitative development of the whole educational system and the improvement of the quality of teaching and education.*

According to actual computations of qualified manpower needs, the staff of professional manpower with higher education amounting to nearly 150,000 in 1960 should be raised till 1980 to more than 330,000. In order to attain that, *about 84,000 new highly qualified specialists should be trained between 1975 and 1980.*

According to the new Hungarian Public Education Act, — as has been mentioned — the training of technicians will take place in the future instead

<sup>2</sup> In the course of the detailed planning of education, most naturally, great attention should be paid to the correct ratios between night and correspondence courses and other different forms of education combined with work, respectively. In spite of the extraordinary significance and many advantages of night and correspondence courses, however, utmost care should be used in the development of this form of education. In the present phase of Hungarian development, for instance, the possibility of expanding night and correspondence forms of higher education is restricted by the fact that, because of the relative backwardness of our secondary education, the number of working people who stand all qualitative demands of higher education is smaller than needed. At the same time, in the Soviet Union, the ratio of students participating in night and correspondence courses of higher education is much bigger than in our country, but the purposive and rapid development of Soviet secondary schooling in the last decade has established an objective basis for that. This is shown by the computations — carried out along the same principles — according to which at the beginning of 1960, in Hungary the ratio of working people in the age of 18—39 years, having completed secondary studies, suited for higher education and not yet learning was half of that in the Soviet Union. In the present stage the extension of night and correspondence courses is necessary and possible in Hungary in case of secondary schooling in the first place. This is also shown by educational statistics, according to which the intake targets of night and correspondence courses in higher education could not be reached in the past one or two years, while the number of students enrolling in the night and correspondence courses of secondary schools has jumped in recent years to manifold of the figure reached in previous years — and this without any effort.

of in technical secondary schools in such technical schools as belong to the system of higher education.\* According to these present conceptions the Act will be carried out in 10 to 15 years meaning that after 1975 technicians will be trained only in such high-level technical schools. Therefore, in estimating the development possibilities of higher education, also the demand for technicians must be reckoned with. The number of technicians employed at present in the Hungarian economic life amounts to about 55,000. This staff should be increased by actual preliminary calculations to at least 250,000 by 1980. Between 1975 and 1980 about 81,000 new technicians must be trained in the higher technical schools.

According to the first variant of the long-term plan for professional manpower needs, therefore — to reach the staff of professional manpower planned for 1980 — nearly 170,000 new highly qualified specialists must leave the institutions of higher education from 1975 till 1980, i.e. about 34,000 each year, of which 16,000 high-level technicians and 18,000 specialists with university college, etc., degrees.

## 2. General educational standards of the population, as the basis for developing higher education and meeting the needs for qualified manpower

The starting point of our analyses is to establish the present level of education of the population. In Hungary, the educational level of the whole population, that of the new generation grown up after the Liberation, and the hypothetical one corresponding to the schooling standards of the past few years is at present as shown in Table 1 (see p. 51).

The educational standards of our population show a continuous and considerable improvement as compared to the level of the past and even to the recent past. It does not suffice, however, to consider this development as reflected against the background of the past. The level reached in Hungary is even higher than the one attained in many West-European countries where the per capita national income is much higher. In long-term planning, however, not even the present level of the most advanced countries can be a sufficient criterion; *the scale to be applied can be the future requirement only.*

If we consider that the population of an age group entering the school age will include in the second half of the long-term plan about 150—160,000 individuals in Hungary according to the general schooling standards of the years 1958—1961, the number of young people acquiring secondary school qualification could be put at the most at yearly 45,000, and only 8,000 would obtain higher qualifications. To meet, however, the demands of the long-term plan of professional manpower, beginning with 1975 nearly 40,000 should be

\* Technical colleges.

yearly enrolled in the first classes of institutions of higher education, i.e. more than what the number of those leaving secondary schools would be if the level of former years were maintained. Thus, with the present level of lower education it would be quite impossible to expand our higher education in a degree satisfying the long-term needs of the national economy for qualified manpower.

The actual educational standards of the population, however, determine the possibilities of higher professional education only at a given date and it can not be taken for a basis for the longer run. Both, our own and international experiences show that the mental capacities of the population to be reckoned with from the point of view of continuation studies are much greater than what is suggested by the data relating to the present level of education. Enrolment in Hungarian universities give some numerical indication to this effect. In the last three years for instance, nearly 50 per cent more young people have met the requirements of entrance examinations than could be admitted, because of the limited educational capacities, as first-year students to universities and colleges. Part of the secondary schools, too, — for want of accommodation — had to turn down a number of young people qualified for continuation studies.

*All that by far does not mean that everyone leaving the lower grades of education would be suited in a given period to continue studies at a higher level.* This is also shown by the school-results, which — though not always in the case of individuals but fairly well for society as a whole — characterize in a given period the mental capacities of students that can be reckoned with from the point of view of continuation studies. Thus e.g. from those leaving the 8th form of general (primary) schools in Hungary in 1960, 43.5 per cent on the average were admitted to the first classes of secondary schools. While, however of those who finished the primary school with “excellent” and “very good” results (1st and 2nd grades), the ratio of children continuing their studies has nearly reached 90 per cent, of those whose average was “sufficient” (5th grade), not even one per cent entered the secondary schools.<sup>3</sup>

The actual average ratios of continuing studies can by no means be accepted as a standard for the future, but the considerable differences between ratios of students with different average results will be also manifest in the future and will affect the extent of continuing studies. Therefore, the qualifications of the populations do not show by themselves the mental capacities that may

<sup>3</sup> We wish to point out that when analysing the interrelations of average school results, and entrance examinations or continuation of studies, respectively, we do not intend at all to declare their importance to be absolute from the point of view of individuals. There always have been and always will be individuals, in the background of whose average failing results there might be excellent talents hiding in certain respects, which should be far-reachingly taken into account in teaching practice. — For society as a whole, however, these exceptions do not impair the close relation of average results and continuing studies.

Table 1

Distribution of population by highest qualification acquired in the Hungarian People's Republic

Highest qualification	Population		According to the level in 1958-61 of the new generation's schooling <i>b)</i>
	at 7 years of age and over	in the age group 20-29 years	
	on 1st Jan. 1960 <i>a)</i>		
Having not acquired primary (general) school qualification (8 years) .....	71.2	45.8	35
Having finished primary studies (8 years of the general school) .....	21.8	40.5	46
Having finished secondary studies .....	5.1	11.3	14
Graduated from institutions of higher education ...	1.9	2.4 <sup>c)</sup>	5
Total	100.0	100.0	100.0

*a)* On basis of the data of the population census of 1st Jan., 1960.

*b)* These ratios have been computed by assuming the stabilization of the average continuation-study ratios of 1958-1961 until those belonging to the same age group have passed over all stages of the educational system.

*c)* This ratio cannot be properly compared to the corresponding data of the other two countries, as about one third of the age group 20-29 — because of their age — could, as a matter of fact, not yet have acquired higher qualification. The comparable figure, corrected by estimates, is about 3.4 per cent and, accordingly, the ratio of those having as highest qualification secondary school-leaving certificates, would be about 10.2 per cent.

be exploited from the point of view of further studies, because only a part of the persons who finish their studies in a certain grade of education, will answer the requirements of the higher grade of education. With each grade, therefore, the ratio set for the admission of the maximum number of graduates suited under given conditions for further studies, must be determined.

It should be further taken into account that many of those beginning their studies in a certain grade of education, do not finish them. Among the young people admitted to secondary schools or universities, there are, and there will be some, who drop out of secondary school or the university because of lagging behind in studies, and others are compelled to leave school for family, health or other reasons. The number and ratio of such young people interrupting their studies is rather significant. Thus, e.g. between 1955 and 1960 about 26-28 per cent of the freshmen admitted had dropped out from the institutions of higher education. In the last two years this ratio much improved as against the past, but the number and ratio of students interrupting their studies is still considerable.

From the above it follows that when analysing how professional qualifications are obtained, not only is the ratio of those continuing their studies to be established but also that of students interrupting them, which — using the term applied in educational planning — is called the "dropping-out ratio".

*On basis of the planned continuation and dropping-out ratios the maximum number of persons suited to reach a certain degree of education or qualification can be established for a given period, and, proceeding backwards from the highly qualified manpower demands of the long-term period, the degree of development of higher and even of secondary and primary education might be determined that satisfies the needs of the national economy in every respect.*

The relations in this connection are as follows:

$$N - \frac{N \cdot L_1}{100} \cdot \frac{T_1}{100} = K \quad (1)$$

$$K - \frac{K \cdot L_2}{100} \cdot \frac{T_2}{100} = F \quad (2)$$

$$F - \frac{F \cdot L_3}{100} = V \quad (3)$$

where

$N$  = the demographically determined population of an age group reaching the 6th year of age which, according to our assumptions, is equal to the number of pupils enrolled in the first class of primary (general) school,

$K$  = the number of students admitted to the first class of institutions of secondary education,

$F$  = number of undergraduates admitted to the first year of institutions of higher education,

$V$  = number of students graduating from institutions of higher education,

$L_{1,2,3}$  = dropping-out ratio of the different educational stages,

$T_{1,2}$  = continuation ratio of students leaving each degree of education.

The significance of the continuation and dropping-out ratios, respectively, is by far not the same in planning. From the point of view of educational standards and professional qualification it is the continuation ratios that are basic and, in consequence of social and economic progress, dynamically changing indicators. As compared to this, the significance of dropping-out ratios is much smaller, for they are relatively constant or at most they change little. In Hungary e.g. the population in the school age was, on the whole, the same in the school years 1937/38 and 1960/61, but the number of those leaving each grade of education has radically changed. Between these two dates the number of pupils leaving the 8th form of primary (general) school has risen to more than threefold, of those leaving secondary schools to more than two and a half-fold and the number of university and college graduates has nearly doubled. There are no exact data available on the dropping-out ratio, as



regards the past. As far as these data can be followed, they show that these ratios have changed but little with time and that these changes have by themselves affected but little the number of pupils (students) finishing their studies.

The quick-rate increase of demand for professional manpower more and more focuses the attention of economists, teachers, psychologists and other specialists engaged in planning of professional manpower needs and the development of education to the need of trying to establish the development possibilities and limits of drawing upon the mental capacities of the population from the point of view of education and professional training on an objective basis.

More recently, in some western countries, in connection with meeting the increased post-war demand for highly qualified manpower, several enquiries of this kind have been carried out, the main findings of which were reviewed by Professor Pieter de Wolf, Director of the Netherlands Central Planning Office, in an interesting lecture at the OEEC conference dealing with the planning of professional manpower, held in Paris, in September 1960. For us, especially the methods applied in the Dutch and Swedish investigations are noteworthy. We wish to deal here with some of their final conclusions. According to the Swedish analysis, maximum 27.8 per cent of an age group is able to pass the school leaving examination of secondary schools, a pre-condition of admission to the university. In view of the fact, that at the time of the study only 8.2 per cent of an age group obtained the school leaving certificate of secondary schools, the supposed limit of 27.8 per cent means a considerable possibility for development in Swedish education.

According to the Dutch survey, at present 2.5 per cent of an age group reach universities, colleges, which ratio might be raised at maximum 5.6 per cent. Though both investigations have revealed several remarkable and valuable methods, the final, numerical results of their application cannot be accepted in socialist countries — and thus neither in Hungary — for planning the development of education. The numerical conclusions of these analyses, namely, reflect those considerable obstacles that stand before working masses if striving to obtain higher education and higher professional qualification. *Part of the socialist countries have already reached or passed the limit set in these studies as a maximum to be attained in the far future and the transgression of which the "mental capacities of the population" do not permit*, although, as is known, socialist countries have succeeded in further raising the qualitative level of education and teaching at the same time. — In Hungary e.g. in the average of 1958—1961, 14 per cent of an age group acquired school-leaving certificates in the secondary schools, which already considerably surpasses the actual 8.2 per cent in Sweden, though it is only half of the 28 per cent upper limit indicated in the paper quoted. Taking as basis, however the enrolment this autumn, the ratio of students leaving secondary schools in 1966 will reach as much as 30 per cent of the population of the corresponding age group.

The ratio of undergraduates drawn into the scope of higher education has in the average of recent years and computed by the qualifications, too, approached the supposed maximum of continuation studies of the Dutch analysis. Owing to the admissions, this year the ratio of undergraduates in higher education will reach even 8 per cent of the population of the corresponding age group, i.e. it will by far surpass the maximum conceived by the Dutch.

Even these continuation ratios, showing by themselves significant development against the past, are far behind the requirements raised by the computations of long-term professional manpower needs, because to reach the supposed staff of professional manpower in 1980, after 1975 more than 20 per cent of the population of an age group should take degrees in institutions of higher education.

### 3. The model

To describe the relations between manpower demands and the educational system as outlined above and, at the same time, to check up on the long-term plan of professional manpower needs, we have drafted a model showing the studies, vocational training and taking jobs of an age group entering working age and of average strength, presented in the form of a Shankey-diagram on page 55.

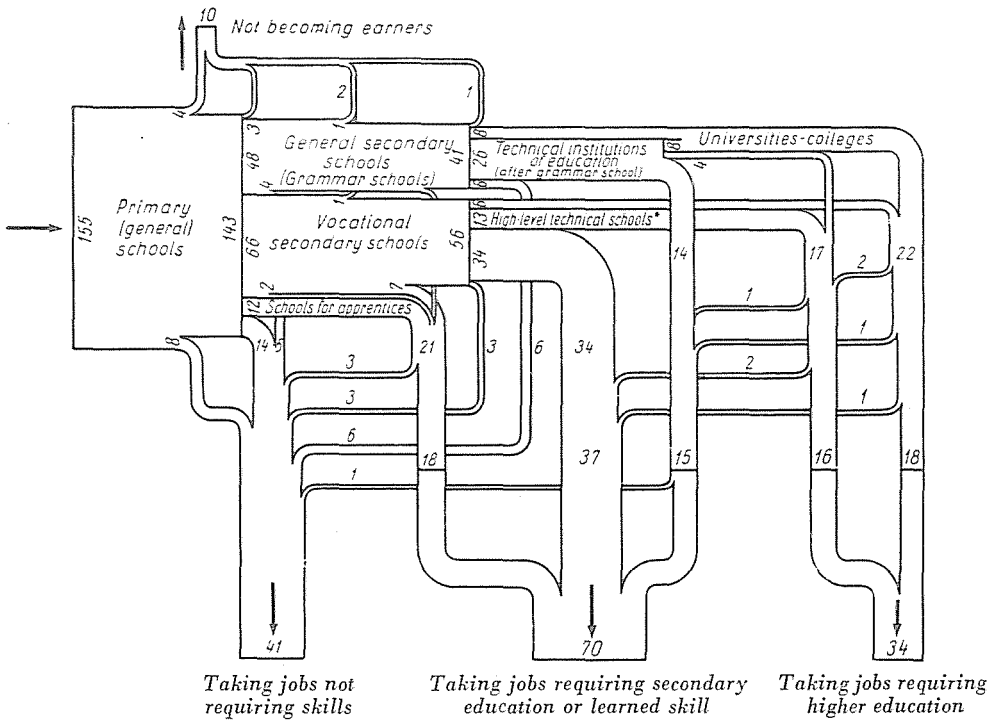
When elaborating the model, we have assumed the Hungarian educational reform to have been fully carried out. The Education Act clearly defines the future structure of the whole Hungarian educational system. Therefore, as we have mentioned before, it has been assumed that the training of technicians will take place after 1975 entirely in high-level technical schools.\* The system of secondary education as the source of undergraduates of universities, colleges and high-level technical schools, has been divided — according to the provisions of the Education Act — into grammar schools, imparting general education and the vocational schools of new type. The grammar school and the vocational secondary school of new type, as the two main future forms of Hungarian secondary education, *enjoy entirely equal rights*, but there are essential differences as regards their objectives and character, which must not be overlooked in planning.

The main objective of the grammar school will be in the future, too, to impart well-founded, broad general knowledge, providing an adequate basis for capable young people, to continue their studies in any institution of higher education, in the first place at universities and colleges. The main task of vocational secondary schools is to train highly skilled workers for the national economy. These vocational schools will at the same time provide

\* (Corresponding to technical colleges).

a sufficient basis for more talented students to be able to continue their studies in any institution of higher education, mainly in the high-level technical schools and acquire higher qualifications.\*

Starting from the above, for the time being only as a hypothesis, we have assumed that of the students leaving grammar schools and continuing studies, 80 per cent will enter universities and 20 per cent high-level technical schools. With pupils leaving the vocational secondary schools, we have assumed inverse



Continuation of studies, vocational training and entering the labour force of an age group of average strength in the Hungarian People's Republic between 1975 and 1980. The numbers in the diagram show the number of those reaching the corresponding grades of education from the total of an age group (thousands) \* (Technical colleges)

proportions as regards their further studies. With students continuing their studies after leaving grammar schools we have also represented in the diagram the future requirement that students of secondary schools obtaining their school-leaving certificates, should go to work for a year or two or a great part of them should acquire the qualification of a skilled worker in so-called "techni-

\* The new grammar-schools might be considered as equivalents of the English secondary modern schools and vocational schools as those of secondary technical schools.

cal institutes" before entering the university, college, or the high-level technical school of the corresponding line.

The ramifications of the stages of education represent a simplified scheme of the actual ways of dropping out of students. These are to symbolize that we have directed those interrupting their studies to the ranks of the non-earners, or to those taking a job or those continuing studies in some other form of education.

In the following we present for comparison the average continuation and dropping-out fact numbers for the four years between 1958 and 1961, as well as the assumed future ratios used in drafting the model.

Table 2  
Continuation and dropping-out ratios of the population of an age group in Hungary

Denomination	1958-1961 fact numbers		1975-1980 hypothetical	
	chain <sup>a)</sup>	basis <sup>b)</sup>	chain <sup>a)</sup>	basis <sup>b)</sup>
	index numbers			
Living population of an age group on entering primary school-age .....	100	100	100	100
Pupils leaving the 8th form of primary school as percentage of the living population of an age group .....	65	65	92	92
Of those leaving the primary school, ratio of secondary school enrolment .....	42	27	80	74
Of secondary school enrolments, ratio of students obtaining school-leaving certificates .....	71	19	85	63
Of students leaving secondary schools, ratio of admissions to institutions of higher education .....	32	5	40	25
Of those admitted to institutions of higher education, ratio of those taking degrees.....	80	5	87	22

a) By "chain" to be meant the ratio to the directly preceding figure.

b) By "basis" index to be meant the ratio to the common basis.

The model and the hypothesis relating to the future serve in this paper only to present the application of the method of analysis and the conclusions to be drawn from it. Therefore, without trying to prove here the accuracy of the indicators used in drafting the model, in the following we want to demonstrate, taking the model for basis, *how the demand for qualified manpower — assuming a given system of education — logically determines the structure, proportions, and development of higher education and even of the whole system of public education.*

#### 4. The demand for qualified manpower and the development of the educational system

From the aforesaid it might be already clear that the demand for highly qualified manpower directly sets the most important tasks of the long-term development of higher education.

The model shows *the development rate, the extent and structural pattern of secondary education being also determined by the quantitative level of higher education to be reached at a given date*. It demonstrates among others that the establishment in Hungary of the vocational secondary schools of the new type was imperative not because the grammar school became "obsolete" but in order to develop higher education, and, above all, to establish the system of high-level technical schools. If the development of higher education requires that about two thirds of the total population of an age group should receive secondary education, there are two reasons why this secondary education cannot be grammar school, imparting only general knowledge. The first one is, that in that case the needs of the national economy for skilled labour could not be any more satisfied by the traditional system of apprenticeship, because there would not be enough apprentices from the population of an age group. If, however, all secondary school students attended grammar schools, the skilled workers could be trained only after that. That means that the national economy would obtain the major part of young skilled workers two or three years later than now. Such lengthening of the time of training would involve many billions of social expenditure above the investments, and educational-budgetary outlays. All these — apart now from other reasons — require in a natural way the establishment of the vocational secondary schools of the new type as the main source of future skilled labour supply of the economy and as the recruitment basis for the high-level technical schools. Our model, at the same time, proves the long-term need of maintaining also humanitarian schools,\* as secondary schools securing an adequate broader educational basis for universities and colleges.

The mutual proportions of university and college undergraduates and high-level technical students also define, about how many of the secondary school students should study in grammar schools and how many in vocational ones. Thus, in a given system of education, the manpower demands of higher education also determine the mutual proportions of the main types of secondary schools.

The requirements of the Education Act, therefore, — by the evidence of the model — determine in an objective manner also the future place and role of the present traditional system of apprentice-training in Hungary.

\* (Grammar-schools.)

For all those, who leave the general (primary) schools, but because of their aptitudes or for other reasons, will not go to secondary schools, the traditional system of apprentice-training — to be maintained but functioning only in a limited sphere — will secure the possibility of further studies and, at the same time, also the skilled labour supply for the national economy, mainly in the more simple or physically more difficult occupations, further in those of small strength and of handicraft character.

Finally, from our model we may draw conclusions on the development rate of the educational system, too. The conclusion is clear in this respect. If, as in the given example, we start from the fact, that beginning with 1976, the institutions of higher education are to release yearly 34 thousand of qualified manpower, from the diagram it might be read, how many students should obtain secondary school-leaving certificates about 1971 and how many should be enrolled in the first classes of secondary schools, beginning with 1966. The latter one also prescribes in the end what number should be reached by 1966 in relation of pupils leaving the 8th form of general (primary) schools.<sup>4</sup>

*From all said it follows that in order to meet the long-term demands of the national economy for qualified manpower it is not sufficient to prepare the long-range development of the proper vocational institutions of education, but we have to take immediate measures now to develop the entire educational system, beginning with the primary schools right up to the universities.*

##### **5. The development of higher education and the possibility of meeting long-term needs for highly qualified manpower**

Thus, meeting the long-term demands for qualified manpower requires the establishment and organization of a great number of new educational institutions in every country. For that, already in the near future, many billions of investment and many thousand new teachers are needed. It is a great task to bring up these, but a still greater and more intricate problem is such an improvement of teaching and education as enables us to carry out the desired development of the educational system and, in the last instance, the training of the great number of specialists needed in the national economy. The fulfilment of this is a teaching task, but its effects will show in the first place in how

<sup>4</sup> We do not intend to complicate interrelations by numerically showing the special requirements arising and the possibilities offered in this connection in the field of educational development resulting from the differences in the population of age groups in Hungary — especially between the first and the second half of the last decade — further from the distribution by sex. Specialists dealing with the planning of education are well aware of it. In this foot note we only want to refer to the special problems arising therefrom.

**Table 3**  
 Number and average school results of those continuing their studies  
 (Hypothetical computations)

Average school results	Pupils leaving 8th form of primary schools		Of pupils leaving 8th form of primary schools enrolled in the 1st class of secondary schools				Students obtaining secondary-school leaving certificates		Of students leaving secondary-schools admitted to the first year of institutions of higher education					
	distribution by results in 1960	hypothetical strength, in thousands in 1975/80 <sup>a</sup>	continuation ratio in 1960 according to results	hypothetical number in 1975/80 according to the 1960 continuation ratios (thousands)	strength		continuation ratio according to results	distribution by results in 1960	strength in 1975/80 thousands (hypothesis)	continuation ratio in 1960 according to results	hypothetical numbers in 1975/80 according to the 1960 continuation ratios (thousands)	strength		continuation ratio according to results
					if demands were met in 1960/80 (hypothesis)							if demands were met in 1960/80 (hypothesis)		
					thousands	percentage						thousands	percentage	
1	2	3	4	5	6	7	8	9	10	11	12			
01 excellent	8,0	11,5	92,0	10,6	11,3	98,0	10,0	9,7	71,0	6,9	8,7	90		
02 very good	10,0	14,3	88,0	12,6	13,5	94,0	11,0	10,7	54,0	5,8	8,6	80		
03 good	32,0	45,8	64,1	29,4	41,5	90,0	25,0	24,2	28,0	6,8	14,5	60		
04 medium	35,0	50,0	20,0	10,0	40,0	80,0	31,0	31,1	13,0	6,8	7,2	14		
05 sufficient	14,0	20,0	0,6	0,1	7,8	37,0	17,0	16,5						
06 failed	1,0	1,4	—	—			5,0	4,8						
07 total	100,0	143,0	43,9	62,7	114,0	73,5	100,0	97,0	27,1	26,3	39,0	40		

a) According to distribution by results in 1960.

the demand for qualified manpower is met. In the following we are going to deal with the problem from this aspect.

According to educational statistics, *the number of students considerably changed between certain dates, but the changes in the average results of the students, in the distribution of the students by results, are relatively slight.* Starting from this experience, in the following we shall numerically demonstrate, taking for basis the 1960 level of average school results, to what extent students with different school results would undertake further studies in Hungary according to the continuation ratios of the model (see Table 3, p. 59).

In the table — as might be seen — we have assumed that the percentage distribution by school results of those leaving primary and secondary schools will correspond to the 1960 proportions even after 1975 (Columns 1 and 7). From these we have computed how the needed school leaving numbers according to the model would be divided by average school results — in absolute numbers (Columns 2 and 8). As next we have established how many would be able to undertake further studies if the 1960 continuation ratios corresponding to school-results remained unchanged in future (Columns 3, 4, 9 and 10). In this case, the number of students leaving primary schools and continuing their studies would supply only 55 per cent of long-term demands ( $62.7 \times 100$  divided by 114.0); and the number of secondary school students obtaining school-leaving certificates and continuing their studies in institutions of higher education only 70 per cent of such demands ( $27.1 \times 100$ , divided by 39.0).

We have computed, finally, what percentage of those with medium (4th grade) and worse than medium results should continue further studies in order to reach the numbers necessary according to the model if we reckoned with a maximum continuation ratio of students with better than medium (4th grade) results (Columns 5, 6, 11 and 12). The figures show that even if 90—98 per cent of pupils with good, very good and excellent results (3rd, 2nd and 1st grades) undertook further studies in secondary schools, 80 per cent of those with medium (4th grade) and 37 per cent of those with sufficient (5th grade) results would have to continue studies. In higher education, of students with excellent, very good and good secondary school leaving certificates 60—90 per cent and with medium or worse results 14 per cent should be admitted.

In education practice there has been up to now no precedent of students with poorer results undertaking further studies on such a scale. The solution lies evidently not in a higher percentage of students with poor results going in for higher studies, still less in “improving” the marks of the students by lowering the standard of requirements, but *in improving — supported by the social and economic development — the level of teaching and education, in considerably raising the average school results of all students, i.e. in pushing the percentage distribution ratios of students in the direction of the marks: good, very good and excellent to a considerable extent.*



*More detailed investigations have shown a possible way for that.* For behind the average figures there are to be found to-day considerable dispersions. These dispersions are all the more characteristic if we examine them by continuation ratios.

*In the socialist society of Hungary, there are to-day no more social barriers before the children of workers as regards continuation of studies. Also the economic barriers, resulting from the conspicuously unequal distribution of income and the high costs of schooling in capitalism, have disappeared. In spite of that, we cannot say that the chances for further studies are already equal for all children. There are three main sources of inequality:* the dispersions in the size of individual earnings and per capita family incomes; the surroundings determined by domicile; and, finally, the differences in family conditions, determined by the schooling of the parents, their cultural standards and occupation.

When analysing the economic costs of education, many are inclined to investigate only how much parents, students and the state, respectively, contribute to the maintenance of educational and connected student-welfare institutions. Such a limited interpretation of educational costs, however, will result in serious errors both from the social and the family or individual point of view. From the standpoint of society, in every case when education involves a constant and regular engagement of young people of working age, — above budgetary and investment outlays, — the loss in the national income caused by the absence from work, or the withdrawing from work of young people in the working age, should be added to the costs of education. This latter social cost is manifold of the actual budgetary outlays and immobilization of capital because of investments.

Being absent from work, however, is not only a social loss, *but a serious material, financial burden for the individual or the family.* Under conditions prevailing in Hungary, for instance, if a child is trained as an apprentice for some industrial occupation, his or her aggregate earnings will amount to more than 100,000 Ft during the period while another young boy or girl reaches only the conclusion of his or her university studies. To these it should be added that earnings of young university graduates — even in relatively advantageous occupations like that of an engineer — reach or surpass the average earnings of highly qualified workers only after some years.

These problems of financial character will be alleviated by the measures through which we want gradually to diminish in Hungary — also because of other considerations — the actual unjustified dispersion of family incomes, which will also lessen the economic difficulties impeding the continuation of studies. — The steady and quick-rate growth of qualified manpower requires also the adjustment of relative wages in favour of skilled labour. Above all, it is necessary to cut down the education costs encumbering the individuals and the family by direct measures, and by the gradual extension of the system

of scholarships it seems expedient to achieve that the subsistence costs of undergraduates in institutions of higher education should not encumber the family but society.

Another source of inequalities is — and one more significant than the former — the difference in conditions determined by the domicile. The more cultured and civilized living conditions of towns — apart from the differences in the family background — facilitate much more the unfolding of a child's mental capacities, than the present conditions of country life. Beside this general effect, *there are other concrete barriers arising before the further studies of a country child*. They begin with the fact that in a lot of country schools teaching takes place in only partly divided classes. In such schools, the mental development of children is comprehensibly much slower than in schools where instruction is completely divided by classes and specialized, as it is the rule in towns and major villages. We are not going here to discuss the effect of such details as the lack of teachers in the country or the lower ratio of specialized instruction in the higher grades of general (primary) schools in the country. Country children, therefore are handicapped already at the outset when leaving primary school for higher education.

Further the studies of country children are rendered more difficult also by the secondary schools being in towns and bigger villages. Thus, the limited accommodations of students' hostels, transport difficulties and often the additional cost thereby involved keep back part of the young country people suited for further studies from learning. Those young students, however, who still enter the secondary schools but travel day by day to school and back home, suffer many handicaps compared with students living at the site of the school or at students' hostels.

The root of all these problems lies in the still existing considerable differences between town and country, to diminish which will still take a long time. From the point of view of continuing studies, however, there is even now a possibility for a *quick improvement of the actual disadvantageous situation*. *Meeting the demand for highly qualified manpower, the development of higher education requires not only the large-scale development of secondary schools, but it demands with an elementary force also the further development of primary education.*

The third source of inequalities in undertaking further studies is partly connected with the former ones. It is the difference in the schooling and general cultural standards of the parents and in the family conditions determined by their occupation. There is a legion of educational, psychological and sociological studies dealing with this problem and its importance.

It is not the subject of this paper to expound these problems; we restrict ourselves only to the statement that this source of inequalities existing to-day in continuation studies of children is manifest — in reciprocal connection with

the former ones — most concretely and most directly in the children's undertaking further studies and in their marks achieved in learning. According to educational statistics, in Hungary, but likewise in other countries, the average results and continuation ratios are best with children whose parents have a higher education and pursue intellectual occupations.

Consequently, the differences arising from the family conditions of children, show in a multiple manner in the parents' readiness to help children within studies, in the example set by the parents as regards interest in intellectual work, in the education for choosing intellectual careers, which in particular advantageously aid children to achieve good results in learning and stimulate them to further studies.

It is not an easy task to eliminate or to diminish considerably the differences of the family background. The social and economic development, however, that has taken place already in socialist countries and that will continue at an increasing rate in the perspective of twenty years (industrialization, the location of industry in the country, a considerable modification of the occupational structure of the population, etc.), will lead to the gradual elimination of present differences in the educational standards, and the ways of living of the various strata of the population. Meanwhile, there are wide possibilities *for aiding young people, in unfolding their mental capacities and for stimulating them to undertake further studies up to the limit of their aptitudes, by improving the quality of school education and by increased social and financial appreciation of qualified labour.* Conditions necessary to the execution of these tasks can gradually be established, the social and economic system of socialist countries offering especially favourable chances for that.

The necessary conditions, however, cannot be brought about from one year to another in any country and their effects cannot make themselves felt immediately either. In planning therefore the development of the educational system, and especially that of higher education, due attention must be paid — in alignment with the particular circumstances prevailing in each country — to the conditions offering themselves in a given period for the population having the necessary preliminary training for further studies, mentally suited for higher studies and ready to learn.

Particularly great care must be taken when analysing these conditions in the course of planning long-term qualified manpower needs and the development of education, as these — as has been shown in outlines in the aforesaid — throw light on many sides of the most important quantitative and qualitative development tasks not only of higher education but of the whole educational and professional training system.

It exceeds the objectives and the necessarily limited volume of this paper to give account here of the methods evolving in Hungary for the examination of "brainpower". We wish to indicate, however, that based on the

initial experiences, we see good chances for conducting such investigations on an objective basis and these might render valuable assistance in the purposive development of public education and vocational training.

Our experiences also show that in our times meeting the demand for qualified manpower and the connected development of education, that is the long period of social reproduction of qualified manpower means such a task, in the execution of which — quite in contrast to other chapters of the long-term plan — even the 20 year long-term plan should be handled as a compass for operative measures needed now. This is the only manner by which one of the main bases of social and economic development: the high level of general education and of professional training of the population can be secured.

J. TIMÁR, Budapest V., Nádor u. 9—13. Hungary