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# GENERAL EDUCATION IN USSR

Report by

Dr. Volodymyr Zahun-Chudyniv, Air Information Division
The Library of Congress, Washington, D. C.

# G E N E R A L  E D U C A T I O N  I N  U S S R

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Dr. Volodymyr Bohun-Chudyniv, Air Information Division
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# PLAN OF REPORT ON GENERAL EDUCATION IN USSR

1) Organisational and Administrational principles of the USSR educational system, and basic aims of Soviet educational policy.

2) System of General Education in USSR.

   A) Pre-school education - including all statistical information & curriculum.

   B) Elementary school - including all statistical information & curriculum; pedagogical "uchilishcha" - including all statistical information & curriculum.

   C) 7-year schools - including all statistical information & curriculum.

   D) Teachers' Institutes - including all statistical information.

   E) 10-year schools - including all statistical information & curriculum.

   F) Pedagogical Institutes - including all statistical information.

   G) Universities - including all statistical information & curriculum.

   H) Preparation of associate professors, professors for Universities instructors - degrees of Candidate of Sciences and Doctor of Sciences.

3) References

4) Appendix I, Universities in USSR: names, addresses, etc.

5) Appendix II, Aviation Institutes in USSR.

6) Appendix III, Statistics on Soviet General Education.

## Education in USSR

### II) Principles of Organization

1) USSR has a state school system: all soviet schools are opened, maintained, and completely controlled by the government. Pre-school institutions (kindergartens, playgrounds, etc.) and extra-scholastic educational and cultural organizations (clubs, libraries, etc.) are also for the most part opened and maintained by the state, and its local organs of authority, while some are maintained by trade unions (profsoyuzi), but all operate under full control of the Ministry of Education or Ministry of Culture, and other Ministries and their local organs.

2) All schools and other educational and cultural organizations are completely separate from any church or religious organization. The teaching of religious subjects is not allowed in any school or other educational and/or cultural organization with the exception of a few seminaries opened for the purpose of supplying priests for the few churches the communists allow to operate. Schools and other educational and cultural institutions are under obligation to show all students a materialistic interpretation of all phenomena of nature and of human society.

3) There is only one school system in the whole Union. (Source: Ye. N. Medynskiy "Prosveshcheniye v SSSR," (Education in USSR, 1955, pp. 12-14)

4) Everyone of school age is under compulsory attendance of a 7-year school (semiletka) free of charge. Tuition was free in all schools from 1919 to 1922, and from 1928 to 1940. From 1922 to around 1928 tuition was paid in all primary and secondary schools in cities and towns, as also in higher educational institutions. War invalids and "the poorest among the workers" were given exemptions of up to complete exemption from tuition. This is documented by the resolution of the 10th All-Russian Congress of the Soviets, Dec. 27, 1922 "point" 6 (see "Direktivy VKP(b) i postanovleniya sovetskogo pravitel'stva o narodnom obrazovanii za 1917 - 1947 gody" (Directives of the VKP(b) and resolutions of the Soviet Government on National Education for years 1917-1947) Moscow, 1947, Lib. of C. call No. LAW KR 2280 A1 1947, p. 31): "Taking into account the extremely grave material (financial) situation of the Republic, the 10th All-Russian Congress of the Soviets, in order to support normal school existence (life), allows as a temporary measure, calculated only for the difficult transition period, the establishment of monetary tuition in primary and secondary schools in cities and towns, as also in higher educational institutions..." The same book also gives the "Postanovleniye VTsIK i SNK RSFSR ot 31 avgusta 1925 g." (Resolution of the All-Russian Central Executive Committee and Soviet of People's Commissars of RSFSR (the former name of all of USSR) from August 31, 1925), "point" 3, Comment: "Up to the time of establishment of a network of

universal elementary school education, the Oblast' Executive Committees reserve the right to charge (students) for tuition in primary and secondary schools of cities and towns, in accordance with the decree of the VTsIK and SNK on March 22, 1923..... (further legal references given)..." The extensiveness of this documentation is done in view of the fact that later propaganda publications state most emphatically that all education was free before 1940, as also state many publication outside of the USSR, including USA. It is very strange indeed to note, for instance, that a supposedly serious and beautifully cross-referenced book like "Soviet Professional Manpower" by Nicholas DeWitt of the Russian Research Center, Harvard University, published by the National Science foundation, Washington, D.C., 1955, states on page 142: "In 1940 tuition fees .... were introduced .... Prior to this time, higher education, as well as other forms of education, was tuition free." This is even more strange in view that the book from which the above documentation of the existence of tuition before 1940 was taken, appears as a reference source in Mr. DeWitt's book. Mr. DeWitt also quotes emphatically on pp. XXVI and XXVII from a paper by A. Bergson that: "However, despite 'many harassing deficiencies it seems that the Soviet Government does not falsify those statistics which it elects to publish.' In other words, 'Contrary to common supposition, the Russians seem generally not to resort to falsification in the sense of free invention and double bookkeeping.'" This

naive optimism will be shown below to be quite undeserved, especially taking into account of the latest Soviet statistical publication, "National Economy of USSR" - Statistical Collection (Narodnoye Khozyaystvo SSSR - Statisticheskiy Sbornik) published in 1956 by Central Statistical Administration of USSR, in which a multitude of wild figures given before are completely neglected or changed often by a factor of as much as 5, as will be elaborated later.

It is unfortunate that the author does not have the space here to correct many more inaccuracies and frequent naive belief in the truth of Soviet propaganda exhibited in Mr. DeWitt's book, which will undoubtedly lead to innumerable false impressions on the part of the readers and students who will use Mr. DeWitt's book as a source.

From 1940/41 ("Higher Education" (Vysshaya Shkola), Moscow, 1948, p. 547; L. of C. call No. LAW KR2280 .A12 1948), to 1956/57 ("Izvestiya" Moscow, Feb. 26, 1956, No. 49, p. 6, col. 1) tuition was paid by the student for attendance in all special secondary schools (technical schools (tekhnikumy), pedagogical schools, medical schools, etc.) and in the 8th, 9th, and 10th grades of the general secondary schools - 200 rubles a year in Moscow, Leningrad, and capital cities of the Union, in other cities, towns and villages - 150 rubles a year. In all institutions of higher learning - 400 rubles in Moscow, Leningrad, and capital cities of the Union, 300 rubles elsewhere, 500 rubles a year in musical, artistic, and theatrical

institutions of higher learning. Tuition in correspondence and evening schools is half of that in others. From 1956/57 tuition in all educational institution is free. All books and school materials in all educational institutions must, however, be purchased by the student. Highly outstanding students of higher educational institutions and secondary technical schools receive substantial monetary stipends. Due to the low salary of workers, and especially peasants, high cost of living, and the resulting high cost of sending youths to towns and cities where such secondary and higher educational institutions exist, the accumulated costs of room, board, books, etc., even without the tuition are largely prohibitive to workers and especially peasants, and can be afforded only by children of specialized workers, government officials, communist party members, etc.. Even workers living in the towns and cities where higher educational institutions exist find higher education prohibitive.

5) All programs for the same-type schools throughout all Union are formally identical. The program in each succeeding school is a continuation of the program of the previous one (e.g. the program of the 5th grade of the 7-year school (semiletka) is a continuation of the program in the 4th grade of elementary school, the program of the 8th grade of the 10-year school (desyatiletka) is a continuation of the program in the 7th grade of the 7-year school) XX. (Source: Ye. M. Medynskiy, "Prosveshcheniye v SSSR," (Education in USSR, 1955, pp. 7-17).

Schools are conducted in the various republics in their respective languages, but the Russian language is a compulsory subject in all schools of the Union (Source: ibid). Study of the Russian language in Union Republics (Latvian, Estonian, Ukrainian, Georgian, etc.) is begun in the second grade.

The Russian language program in non-Russian schools consists of less material than does the same program in Russian schools, as was noted in "Narodnoye obrazovaniye" No. 2, 1955, pp. 14-17. Entrance examinations in the Russian language to higher educational institutions are conducted on the basis of the programs of the Russian schools. That means that students graduating from non-Russian schools, have less chance of passing the entrance examinations, compared to the students who graduated drom a Russian school. In higher grades of the majority of schools in the so-called "Autonomous" republics of RSFSR (actually a part of RSFSR), all subjects are taught in the Russian language, and the native language is taught only as a separate subject. Due to this, their weekly curriculum is 13% - 15% greater than in Russian schools, and, as is noted in "Narodnoye Obrazovaniye," No. 2, 1955, p. 17, "the overload of the curriculum in non-Russian schools, has an adverse effect on the progress of the students, leads to shallow studies of school subjects, and affects adversely the health of the students." In the same magazine it is noted that in these schools "there are also many teachers of the

Russian language who don't know the native language of the students. These teachers find great difficulties in their work."

Russification of non-Russian nationalities by the Russians is officially motivated by the following: "In non-Russian schools, the Russian language is the source of communist upbringing of the children, the means of their joining the progressive Socialist culture." (Source: "Narodnoye Obrazovaniye" No. 2, 1955, p. 14).

A similar picture of Russification, though on a lesser level, is seen also in all Union republics of the USSR and its satellites. Thus, the declarations of the communist party of USSR, as to the right to study in one's own language of 44 different nationalities in R.S.F.S.R., and also in the other Union republics of the USSR, are not based on fact.

## The Aims of Education in USSR

According to the program of the communist party in USSR, the aims of academic as well as ideological education and training are still to prepare the succeeding generations to a final and conclusive seizure of power of the whole world, and the establishment therein of a universal communist state. (see Medynskiy "Education in USSR" 1955, p. 7).

## Leadership in Soviet Education

1) All directives concerning education are given by the Central Committee of the communist party, or rather the Politburo. Laws and resolutions that stem from these

directives are put into proper form by the Council of Ministers and officially released in the name of the Supreme Soviet of the USSR. These resolutions determine the type of schools to be maintained, establish the rules of conduct to be followed by students and teachers, determine the distribution of graduates to jobs, etc..

2) Pre-school institutions, and schools of general education (elementary, 7-year school ("semiletki"), 10-year school ("desyatiletki"), schools of worker and peasant youths, schools of adult education, are directed by the Ministries of Education of the Republics they are situated in.

3) Lower professional educational institutions (trade schools and railroad schools, schools of factory technology) that graduate skilled workers, are under direct control of the All-Union Ministry of Labor Reserves. The other lower professional educational institutions are maintained and controlled by the Ministries of Specialities.

4) Programs and methodology of secondary professional educational institutions (industrial and agricultural "technicum," medical schools, pedagogical schools, etc.) are under the control of the Ministry of Higher Education of the USSR. The financing and material maintenance of these institutions is done by the Ministries of Specialities. Medical schools, for instance, are financed, etc., by the Ministry of Public Health, pedagogical schools are financed by the Ministry of Education, etc.. (Source: Medynskiy, "Education in USSR," 1955, p. 7-17 ).

5) Universities, higher technical, agricultural, economic, and judicial institutions (33 universities, 181 technical institutes, 109 Agricultural & Forestry, 30 economical and judicial, - total 353). are under full and direct control, of the Ministry of Higher Education of the USSR, in all phases - administrative, scholastic, financial, etc. The other Institutions of Higher Education (pedagogical - 222, medical - 77, art - 47, physical culture - 15 library, literary, and historical-archive institutes - 5; teacher's institutes - 5; total by Jan. 1, 1956 - 371) are under the financial, and other material control of the appropriate Specialized Ministries of the Republics in which they are situated. The total number of higher educational institutions is 724. (compiled from "Spravochnik dlya postupayushchikh v vysshyye uchebnyye zavedeniya 1956" Moscow)

In questions of program, methodology, etc., the control is in the hands of the Ministry of Higher Education of the USSR. In 1945 Committees on the Affairs of educational-cultural institutions (libraries, museums, reading halls, lecture bureaus, etc.) were formed in all republics. They were later renamed Ministries of Culture. Thus in the USSR, two All-Union Ministries are in charge of education - The Ministry of Higher Education and the Ministry of Labor Reserves, and two ministries each in every individual Republic, the Ministry of Education and Ministry of Culture. Besides this, some separate phases of education are under a series of

committees(Committee of Physical Culture and Sport, Committee on Affairs of Art, Ministry of Cinematography, Committee of Radio Information of the Soviet of Ministers of the USSR). Ministries of Education of the individual Republics of USSR, kray and oblast' organs of public education, have their own school inspectors, part of whose duties is methodological help to teachers and control of their work.

## III. System of General Education in USSR

The system of general public education in USSR is composed of:

1) institutions of pre-school discipline,

2) schools of general education of all grades and types, and pedagogical "uchilishcha",

3) Higher Educational Institutions: Universities, Teachers' Institutes, Pedagogical Institutes Degrees.

Besides the system of general education there is a network of secondary and higher trade and professional schools, the discussion of which is beyond the time scope of this report, and can be given in a separate report, if such is required, and which is, in the opinion of the author of this report of high importance in the study of USSR SCIENTIFIC cadres.

### A. Pre-school Institutions - (kindergartens and playgrounds)

Pre-school institutions take care of children from 3 to 7 years of age. The acting regulations governing these agencies were approved by the Ministry of Education in 1944. Among the points covered by the statute are the following:

1. A kindergarten is a State Institution for Soviet upbringing of children 3-7 years.

2. A kindergarten, irrespective of the organization or institution that maintains it, is conducted on the basis of the "Regulations of the Kindergarten" ("Ustava detskogo sada") and the program-methodical direction of the Ministry of Education of R.S.F.S.R..

3. For the realization of abovementioned point 1., the kindergarten:

b) "Must cultivate in the children love of Soviet Homeland, its leaders, the Red Army, thus aiding the successful upbringing of the children in later schooling; children must be told, in understandable to them terms, of the life and work of Lenin and Stalin, arousing and strengthening in the children love for Lenin and Stalin" (Stalin is now probably replaced by Khrushchev and others). (Source: Ye. N. Medynskiy, "Prosveshcheniye v SSSR" [Education in USSR], Moscow, 1955, pp. 47-54).

Kindergarten teachers must graduate from pre-school secondary pedagogical institutions (doshkol'niye pedagogicheskiye uchilishcha), of which by Jan. 1, 1956, there was 47. (Source, "Spravochnik dlya postupayushchikh v srednyye spetsial'nyye uchebnyye zavedeniya 1956"). Besides these there are also pre-school departments of 57 pedagogical "uchilishcha" for public school teachers, 14 pre-school pedagogical "uchilishcha" have also correspondence departments, and 2 have evening sections. Table 1 shows the distribution of pedagogical institutes among the various republics.

TABLE 1

| Republic | Doshkol'nyye pedagogicheskiye uchilishcha (pre-school pedagogical institutions | Correspondence Debts at pre-school pedagogical institutions | Evening Debts of pre-school pedagogical institutions |
|---|---|---|---|
| R.S.F.S.R. | 40 | 14 | 2 |
| Az. S.S.R. | 1 | -- | -- |
| Latvian S.S.R. | 1 | -- | -- |
| Uzbekh. S.S.R. | 3 | -- | -- |
| Belorusskay S.S.R. | 1 | -- | -- |
| Karelo-Finskaya SS.R. (now part of R.S.F.S.R. | 1 | -- | -- |
| TOTAL | 47 | 14 | 2 |

(Table 1 was compiled by the author from the "Spravochnik dlya post-upayushchikh v sredniye spetsial'nyye uchebnyye zavedeniya" 1956).

One must note from Table 1 a significant fact: namely, that pre-school pedagogical "uchilishcha", 41 out of a total of 47, are located on the territory of R.S.F.S.R., whereas many republics - Estonia, Latvia, Kazakh Republic, Ukraine (Ukraine's population is second in number only to Russia's), Azerbaidzhan, Armenia, etc., do not have a single pre-school "uchilishche" among them. This is an indication of a basic inequality in status among the republics, based on solely Political factors - Russia's desire to dominate and absorb everything. The various republics mentioned, not being able to prepare enough personnel to staff their kindergartens, are forced to draw on the output of Russia's "uchilishcha", drafting teachers who cannot even speak the native language of the republic concerned, leading to Russification of kindergartens, or to neglect

kindergarten education altogether. This phenomenon is manisfested also in other forms, to be mentioned later, which lead to the conclusion that Russia is definitely exploiting her supposedly equal Union republics, which are reduced to colonies of R.S.F.S.R.

For the preparation of pre-school workers of higher qualifications, some Pedagogical Institutes have special pre-school departments. In R.S.F.S.R. such departments exist in Moscow (Pedagogical Institute im. V. I. Lenin), in Leningrad (Pedagogical Institute im. A. I. Gertsen), in Gor'kiy, Molotov, Ryazan', Rostov-na-Donu, and some others.

Children's books have a very important part in pre-school child training. At the end of their stay in kindergarten, children must be able to count to 20-30, compare numbers, be able to write numerals, add and subtract numbers from one to ten, know weights and measures, know the days of the week, be able to tell time being accurate to the hour. The child must be able to cogently and understandably retell a short story to others, tell of an episode in his or her life, know by heart several poems. (11)

Numbers of children attending kindergarten in USSR between 1929-1955:

TABLE 2

| Year | 1928 | 1933 | 1940 | 1950 | 1955 - |
|---|---|---|---|---|---|
| Numbers of children in thousands | 828 | 5,917 | 1,130 | 2,260 | 3,000 approx. |

TABLE 2a

| Year | 1928 | 1933 | 1940 | 1950 | 1955 |
|---|---|---|---|---|---|
| Numbers of children in thousands | 130 | - | 1,172 | 1,169 | 1,577 |

The numbers of children attending kindergarten, given in table 2, between 1929-1955, were carefully checked in several sources. This was done in view of the obvious irregularity in the table, deviating from standard Soviet practice of giving statistics in an orderly manner, according to the maxim that every phase of Soviet life must show progress from year to year, and also because this table can be used to show the real state of affairs in pre-school education in USSR, which affects the rest of the educational system as well.

As seen from table 2, the numbers from 1933 to 1940 show a catastrophic decline from 5,917,000 in 1933 to 1,130,000 in 1940.

The documents from which these figures were derived are the following:

I) point "b" in Stalin's report during the XVII meeting of Communist Party of USSR, on the fulfillment of the first five-year plan, given in Jan 26, 1934, was said: "The rise in the number of children in pre-school education was from 838,000 in 1929 to 5,917,000 in 1933;"

II) in the resolution of the XVII meeting of the Communist Party concerning the second five-year plan (1933-1937), given in January 1934, the statement mentioned above was confirmed: "...not counting pre-school education, which even in 1932 reached 5.2 million children..;"

III) the law on the 4th five-year plan, concerning the reconstruction of the national economy of USSR in 1946-1950, states in the section on kindergartens: "...to increase the number of children attending kindergartens in 1950 to 2,260,000, that is to double the number (of children attending kindergartens) in 1940". (I, II and III, were obtained from pp. 70-76 of "Direktivy

VKP(b) i post. sov. prav. o nar. obr. za 1917-1947"). From this document it follows that in 1940 there were 1,130,000 children attending kindergartens in USSR.

4) The data in table 1 for 1955, 3,000,000 children, was derived from directives of the fifth five-year plan (1951-1955), where it was stated: "To increase the number of kindergartens by 40%." ~~(16)~~

The numbers from 1933 to 1940 show a decline from 5,917,000 in 1933 to 1,130,000 in 1940.

There is a slight chance that the authors of the fourth five-year plan did not look at the statistics given in the first and second five-year plans, but it is more probable that the obviously too great number given by Stalin was decreased consciously. The increase of almost 5 million, a seven-fold increase, in the space of 4 years can not possibly be true, if only because it is physically impossible to train the number of teachers necessary, and also to build the number of buildings to accomodate them all, and all that in the most difficult period of Soviet rule, when in one part of the Union - Ukraine - in 1932-33 over 5 million Ukrainian peasants died of hunger, among them a very great number of children of pre-school age. It seems that Stalin, in order to cover up the reality in USSR during these years, used statistics as a smoke screen, a device now often used, and not without sucess, by trained disciples of Stalin.

In July 1956, the Central Statistical Division of the Council of Ministers of the USSR, published a work called: "Narodnoye khozyaystvo SSSR - Statisticheskiy Sbornik." (a statistical survey). This collection contained (on p. 248) the table 2a.

Data given in table 2a differs sharply from that in table 2 (with the exception of 1 entry for 1940), thus refuting the previously published data on the subject. The number of children in 1928 was diminished almost 6-fold, in 1950 and 1955- almost 2-fold. The controversial 5 million entry for 1933 is omitted entirely. Some other data published in the same collection differs just as widely from previously published announcements. This latest publication is of the greatest importance in that, among other things, it shows how careful one must be with Soviet statistics in spite of what Mr. Dallin has to say, when one tries to formulate from them the facts of Soviet life. Inhabitants of the Soviet Union not only know of the unreliability of their statistical data, but almost take it for granted.

The author, having lived in the Soviet Union until after it was invaded by Germany, well remembers an anecdote circulated among Soviet scientists: "There are three basic types of lies - ordinary lies, extra-ordinary lies, and statistics (official Soviet statistics).

Conclusions for the last table (if it is to be regarded as more valid) are the following. In 1955 approx. only a small fraction of all children eligible for kindergarten in USSR, could actually attend it. Therefore, now and in the near future, only a small number of public schools can get students who attended kindergarten, and this will have a marked effect on the quality of students in the semiletka (seven-year school), desyatiletka (10-year school), and the rest of the Soviet educational system. One of the reasons why the effect would be of importance is that primary and secondary education in USSR comprise 10 years of study, while in USA, Norway, Denmark, etc. it is 12 years of study. Therefore, kindergarten in USSR plays a greater role in education than it does in the USA, being used

as the equivalent of the first grade of public school. Table 3 shows the distribution of kindergartens in various years among the urban and rural population.

Numbers of children in kindergartens in USSR (expressed in thousands). Source: ("Narodnoye Khozyaystvo SSSR - Statisticheskiy Sbornik", 1956, Moscow, p. 248)

Table 3

| Year | Urban | Rural |
|---|---|---|
| 1928 | 119 | 11 |
| 1940 | 906 | 266 |
| 1950 | 958 | 211 |
| 1954 | 1305 | 272 |
| 1955 | 1410 | 303 |

From table 3 it follows that only approx. 20 percent of the kindergartens were situated in rural areas in all periods shown, while one must note that the rural population of the USSR comprises now 56% of the total. This points out a general tendency of the Soviet government to improve the conditions in cities, in spite of the fact that the standard of living in the collective farms is far lower from that of the cities.

1) Elementary school is a 4-grade school for children of 7-10 years of age. From 1930 on, attendance is compulsory and tuition in it is now free. The course of study is identical with that of the first four grades of the semiletka and the first four grades of the desyatiletka. The numbers of children attending the first 4 grades of schooling (in either elementary school, semiletka, and desyatiletka) are shown in table 4.

Table 4

| Years | Numbers of students attending first 4 grades (millions) | | | | | Population in USSR (millions) (III) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Previous Statistics | | Latest statistical inform. (III) | | | | | | |
| | Given by Stalin, XVII Cong Comm. Party (I) | Given by Statist. Collect. 1940 (II) | Total | Urban | Rural | Total | Urban | Rural | Percent Rural to Urban |
| 1926 | | | | | | 147 | 26.3 | 120 | 82.1/17.9 |
| 1927/28 | | | 9.91 | 2.13 | 7.78 | | | | |
| 1928/29 | 11.70 | 10.35 | | | | | | | |
| 1932/33 | 19.16 | 17.674 | | | | | | | |
| 1938/39 | | 21.203 | | | | 170.6 | 56 | 114 | 67.1/32.9 |
| 1940/41 | | | 21.37 | 5.33 | 16.04 | 191.7 | 60.6 | 131 | 68.4/31.6 |
| 1950/51 | | | 19.67 | 6.14 | 13.53 | | | | |
| 1954/55 | | | 12.70 | 6.10 | 7.60 | | | | |
| 1955/56 | | | 13.60 | 5.70 | 7.90 | 200.2 | 87 | 113 | 56.6/43.4 |




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B) Schools of Primary and Secondary General Education in USSR

The primary and secondary school system in USSR consists of elementary school (4 grades) for children 7-10 years of age, semiletka (7-year school) for children 7-13 years of age (7 grades) and Desyatiletka (10-year school) - 7-16 years of age (10 grades).

Table 5 shows the number of children attending public school in USSR, during 1927-1956. These numbers are taken from three different original Soviet sources. (I) - From Stalin's report to the 17th Congress of the Communist party concerning the work of Ts - KVKP(b) on January 26, 1934; (Directives and resolutions...p. 70, Lib. of Cong. Call No. LAW KR 2280 .A1 1947). (II)- "Cultural [illegible]opment in USSR," - Statistical Collection, Gosplanizdat, [illegible], p. 518. (III)- "National Economy of USSR" - Statistical Collection, Central Statistical Administration of the Soviet of Ministers of USSR, Moscow, 1956, Lib. of Cong. Call No. H. A. 1433 .A5 1956, pp. 17, 224.

The contradiction between Stalin's statistical publications concerning the numbers of children attending elementary school in 1928-11.7 million, 1933-19.6 million, and the data (1956) given by the Statistical Administration of USSR for the same years (1928-10.35 million; 1933-17.67 million), points out once again the necessity of being very careful with statistics published officially by the USSR, but this table leads to another very important conclusion as to the present conditions in USSR, namely that the number of students in public school during 1950/51 and 1954/55 fell sharply - from 19.67 millions to 12.7 millions, that

is a 7 million decrease (36%). The official explanation for this decrease is that the enrollment during these years consisted of children born during the war, and the birthrate during the war years was considerably reduced. (Source: footnote on p. 221 of "National Economy of USSR" - Statistical Collection 1956).

Aims of elementary school education in U.S.S.R.

The public school must, in way understandable by the children, of 7-10 years of age, instill in them the background for a world outlook of dialetic materialism, systhematically develop the interests and curiosity of the children, and develop their memory, attentiveness, thinking, speaking. The children are taught to observe the objects and manifestations of the world around them, get an understanding of the materialistic quality of the world, are to look at phenomena in terms of their logical relationship and development. (Source: Ye. N. Medynskiy "Public Education in USSR" (Narodnoye obrazovaniye v SSSR) Moscow, 1952, pp. 58-59).

The program and curricula of elementary education

The programs and curricula of elementary schools (as also of the semiletka and desyatiletka) are formed by the governments of the individual Republics of the USSR, but the programs must be essentially identical (in reality the Ministry of Education of RSFSR forms the programs, and the other republics copy them).

In 1955/56 a new curriculum plan for all branches of schools of general education, including the elementary school (grades 1-4), was instituted in USSR. (Source: "Narodnoye Obrazovaniye", January 1, 1955, pp. 1-2). This new plan was worked out by the Academy of

Pedagogical Sciences of R.S.F.S.R., jointly with the Ministry of Education of R.S.F.S.R., on the basis of directives of the 19th Congress of the Communist Party of USSR on the establishment of polytechnical-type instruction in schools of general education, which were based on the premise that the secondary school of general education must not only prepare the students "to enter institutions of higher education, but also form a basis for the preparation of students for entrance into secondary technical educational institutions, and even in a greater degree to prepare skilled workers for different branches of the national economy: industry, agriculture, transportation, communications." (Source: ibid.) The new curriculum approved by the Ministry of Education of USSR, contained some changes with respect to the old one. The new and the old curricula are shown in table 5.

Table 5

| Subject | Number of hours (per week) Grades I old | I new | II old | II new | III old | III new | IV old | IV new | Total number of hours old | Total number of hours new |
|---|---|---|---|---|---|---|---|---|---|---|
| Russian language | 15 | 13 | 14 | 13 | 15 | 13 | 8 | 9 | 1716 | 1584 |
| Arithmetic | 6 | 6 | 7 | 6 | 6 | 6 | 7 | 6 | 856 | 796 |
| Nature study | - | - | - | - | - | - | 2,(3) | 2 | 83 | 66 |
| History | - | - | - | - | - | - | 3 | 2 | 99 | 66 |
| Geography | - | - | - | - | - | - | 3,(2) | 2 | 82 | 66 |
| Physical education (~~64 h~~) | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 198 | 264 |
| Art (drawing) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 132 | 132 |
| Singing | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 132 | 132 |
| Shopwork and manual training | - | 1 | - | 1 | - | 1 | - | 1 | | 132 |
| TOTAL | 24 | 24 | 24 | 24 | 25 | 24 | 27 | 26 | 3300 | 3234 |

The new curriculum for elementary school (grades 1-4) now includes a shop class once a week and has 2 hours a week of gym instead of 1 for grades 1 and 2; and 9 hours of Russian instead of 8 for the 4th grade. Decreased were the Russian language in the first and third grade by two hours a week and in the second grade by one hour, arithmetic in the second and fourth grades by 1 hour history by 1 hour (4 gr.,), nature study and geography were decreased by $\frac{1}{2}$ hour each (in the 4th grade).

Thus, the "Polytechnization" of the elementary school curriculum was expressed in the inclusion of a shop class once a week in all four grades (132 hours), an increase in the physical education

(from 198 to 264 hours), a 66-hour decrease in arithmetic, a 132-hour decrease in Russian, a 17-hour decrease each for nature study and geography, and a 33-hour decrease in history, and also in the 66 hour decrease of the total number of hours (from 3300 to 3234).

Comparing the two plans, one must note that according to the new curriculum, the standards of education will be somewhat lower than before without even any improvement in the "technical" quality of the students, as 1 hour of manual training a week (for which anyway very little equipment is available in USSR for most schools especially in rural communities) will not help much, especially considering the ages of the students involved. A positive quality of the curriculum is that in spite of the decrease, a lot of time is devoted to arithmetic - 25% of the curriculum.

The arithmetic program of elementary school includes counting 4 arithmetical operations on any whole numbers, abstract numbers as well as concrete numbers (measurements of things), the notion of fractions, and elementary concepts of geometry. The solving of problems is an important part of arithmetic study.

The study of history is given by the Soviet government an "important" task. Teachers of history must explain to the children the role of Lenin and Stalin (now Stalin is deemphasized), and the role of, led by them, Communist Party in the struggle for communism; and to evoke in the children "wholehearted love of their Socialistic Homeland, and fervent hate of all (its) enemies and oppressors of workers". (Source: Medynskiy, "Education in

USSR", Moscow, 1952, p. 63). The first parts of the study of history are given in classes of Russian or of their native in the second and third grade. In the fourth grade, 2 hours a week are devoted to study of elementary history of the USSR.

Physical education has as its aim to improve the health of the children, and to cultivate "conscious discipline and collectivism".

Fourth grade students have to take an examination in the Russian language, written and oral. Non-Russian schools also have examinations (written and oral) in the native languages.

Almost ¼ of all the elementary schools in the Union have only one teacher (are one-room schools) who fulfills all academic and administrative functions. Other schools have 2-3 or more teachers, at most 40 students per teacher.

In two-room schools, one teacher leads the first and third grades, while the other leads the second and fourth grades. Every year they switch roles, the second taking the first and fourth grades, etc., so all children have the same teacher for four years. Such an approach allows the teacher to know closely all his students, and thus be able to approach them individually.

In one-room schools one teacher takes care of all four grades, either at the same time or in two sessions. The marking system is based on 5; five being excellent, 4 good, 3 satisfactory, 2 bad, 1 very bad (2, and 1 are failing marks).

Table 6 shows the number of separate elementary schools in USSR (not parts of 7-year schools or 10-year schools) and the numbers of students attending, and also the average number of students per school for the years 1940/41 to 1955/56. This

table was constructed on the basis of statistical data published in the "National Economy of USSR" - Statistical Collection" 1956, p. 223.

Table 6

| Years | 1940/41 | 1950/51 | 1954/55 | 1955/56 |
|---|---|---|---|---|
| Number of elementary schools (gr. 1-4) in thousands | 125.9 | 126.4 | 111.1 | 108.8 |
| Number of students in elementary school in millions | 9.8 | 7.5 | 3.6 | 3.6 |
| The average number of students per school | 77.8 | 60 | 32.4 | 33 |

From the preceeding table it follows that in separate elementary schools in the period of 1954-56 there were on the average 32-33 students per school, that is during these years the overwhelming majority of these schools were one-room schools. This table first shows that in 1950/51 the average number of students in these schools was 60 students per school, that is in that year the majority of schools were two-room schools, and only a smaller number were one-room schools, which is contradictory to fact. Magazine "Narodnoye Obrazovaniye" of the ministry of education of RSFSR published in 1950 No. 1, pp. 17-18 states:

"In Stalingrad oblast', in 1431 out of 3171 points of habitation (villages) of the oblast' there are no schools, due to a very small number of school-age children living there. 1184

points of habitation have elementary schools, the numbers of students being from 8 to 40. Such distribution of the rural population is characteristic also of other oblast' crays, Autonomous Republics."

Thus the number of two-room school in 1950/51, was nearly that of 1955/56, that is 1184 were one-room schools, and 556 schools were schools with numbers of students exceeding 40 per school. This data confirms the above quotation, and the previous conclusion that the statistical administration of USSR gave an exaggerated figure for 1951 attendance of separate elementary schools (Table 4) and that the overwhelming majority were 1-room schools.

## B1) Pedagogical "Uchilishcha" and Preparation of Elementary School Teachers

Elementary school teachers are trained in pedagogical schools - "uchilishcha" (secondary professional pedagogical schools). The total number of these "uchilishcha" by January 1, 1956 was 360, including 3 correspondence schools (source: "Spravochnik dlya postupayushchikh v sredniye spetsial'nyye uchebnyye zavedeniya" (Handbook for enrollment in secondary special schools) 1956, Moscow).

Ninety-two pedagogical uchilishcha have correspondence school departments, the students of which are mostly people who are already teachers but have not graduated from a pedagogical "uchilishche" or its equivalent, and are obligated to graduate from these correspondence schools within a certain time. 57 of the pedagogical "uchilishcha" have pre-school departments to prepare kindergarten teachers.

Table 7 shows the distribution of the pedagogical uchilishcha among the various republics of USSR.

TABLE 7

| Republic | Population (millions) | ordinary pedagogical uchilishcha | Corresp. schools | Corresp. departments of uchilishcha | pre-school departments |
|---|---|---|---|---|---|
| R.S.F.S.R. | 112.6 | 200 | 3 | 79 | 23 |
| Ukrainian S.S.R. | 40.6 | 40 | — | — | 11 |
| B.S.S.R. | 8.0 | 16 | — | 1 | — |
| Uzbek S.S.R. | 7.3 | 8 | — | — | 3 |
| Kazakh S.S.R. | 8.5 | 17 | — | 2 | 5 |
| Georgian S.S.R. | 4.0 | 17 | — | | 6 |
| Azerbaidzhan S.S.R. | 3.4 | 17 | — | — | — |
| Lithuanian S.S.R. | 2.7 | 5 | — | — | 1 |
| Moldava S.S.R. | 2.7 | 5 | — | 2 | 1 |
| Latvian S.S.R. | 2.0 | 3 | — | 3 | 2 |
| Kirgiz S.S.R. | 1.9 | 2 | — | 2 | 2 |
| Tadzhikh S.S.R. | 1.8 | 8 | — | — | 1 |
| Turkmen S.S.R. | 1.6 | 6 | — | levening | 3 |
| Estonian S.S.R. | 1.4 | 1 | — | 1 | — |
| Karel-Finnish S.S.R. | 1.1 | 2 | — | 1 | — |
| Total | 200.2 | 357 | 3 | 92 | 57 |

One must note the disproportionality in distribution of pedagogical uchilishcha compared to the population. R.S.F.S.R. has five times more uchilishch than Ukrainian S.S.R., while R.S.F.S.R. has only 2.7 times the population of Ukraine. Of 92 correspondence departments 79 are in R.S.F.S.R., and Ukr. S.S.R., Georgia, Azerbaydzhan, Uzbek S.S.R., Kazakh S.S.R., and Kirgiz S.S.R. do not have among them a single correspondence department. All three correspondence schools of the Union are located in R.S.F.S.R.. The logic of such uneven distribution is in the Russification motivations of Russia. It gives the Russian people a privilege of training the greater part of schoolteachers, who will be sent for employment in the other republics. The students who wish to become teachers but cannot afford to live in a place where one of their national schools is located, are forced to study in a Russian correspondence school or department, thus, not learning their own language, but concentrating on Russian, must go to Moscow to take examinations, etc., while they are not trained to teach in the schools of their native republic, thus, lowering their worth as teachers and leading to further Russification.

Before 1947 the pedagogical uchilishche was a 3-year secondary school; after 1947, a 4-year school. From 1940 to 1956 the tuition was 200 rubles a year in Moscow, Capital cities, and 150 rubles in smaller towns.

The graduate of such a school is given the title of teacher of public school, and those finishing the pre-school

department, a teacher in pre-school education. Those who finish the pedagogical uchilishche with excellent marks, but not more than 5% of the total number of graduates earn the right to enroll in an institution of higher learning, and all others may also, after three years of work in their profession (teachers in public school and kindergartens) enroll in an institution of higher learning, after having passed the customary entrance examination (Source: "Spravochnik dlya postupayushchikh v vysshyye uchebnyye zavedeniya 1956" Moscow, 1956, p. 3).

Table 8 shows the curriculum of the pedagogical uchilishche.

TABLE 8

| No. | Subject taught | Number of hours: Total | Number of hours: Number spent on each part of subject |
|---|---|---|---|
| 1) | Russian language and methodology of teaching the Russian language | 447 | |
| | a) Russian language | | 357 |
| | b) Methodology of teaching Russian | | 90 |
| 2) | Literature | 389 | |
| | a) Literature | | 325 |
| | b) Children's literature | | 64 |
| 3) | Mathematics and methodology of teaching mathematics | 647 | |
| | a) Arithmetic | | 248 |
| | b) Algebra | | 144 |
| | c) Geometry | | 182 |
| | d) Methodology of teaching arithmetic | | 73 |
| 4) | Physics | 254 | 254 |
| 5) | Chemistry and minerology | 110 | 110 |
| 6) | Nature study and methodology of teaching nature study | 274 | |
| | a) Anatomy and physiology of man | | 68 |
| | b) Botany | | 72 |
| | c) Zoology | | 57 |
| | d) Basic evolutionary theory (Darvinism) | | 42 |
| | e) Methodology of teaching nature study | | 35 |
| 7) | Geography and methodology of teaching Geography | 289 | |
| | a) General study of the Earth | | 110 |
| | b) Geography of foreign countries | | 72 |
| | c) Geography of the U.S.S.R. | | 72 |
| | d) Methodology of teaching geography | | 35 |

TABLE 8 - con't

| No. | Subject taught | Number of hours | |
|---|---|---|---|
| | | Total | Number spent on each part of subject |
| 8) | History and methodology of teaching history | 399 | |
| | a) History of USSR | | 254 |
| | b) New History | | 110 |
| | c) Methodology of teaching history | | 35 |
| 9) | History of VKP (b) Comm. Party of USSR) | 92 | 92 |
| 10) | Constitution of U.S.S.R. | 51 | 51 |
| 11) | Psychology | 57 | 57 |
| 12) | Pedagogical study (pedagogy) | 190 | 190 |
| 13) | History of pedagogy | 64 | 64 |
| 14) | Logic | 54 | 54 |
| 15) | School hygiene | 36 | 36 |
| 16) | Calligraphy and the methodology of teaching caligraphy | 108 | 108 |
| 17) | Drawing and methodology of teaching drawing | 245 | 245 |
| 18) | Singing and the methodology of teaching singing | 209 | 209 |
| 19) | Physical culture and methodology of physical culture | 280 | 280 |
| 20) | Practical work in shops and on collective farms | 205 | 205 |
| 21) | Observation of lessons and trial lessons | 212 | 212 |

Pedagogical uchilishcha, as all other special secondary schools, admit students of both sexes, ages from 14 to 30 (evening and correspondence schools have no age limitation), and admit all who have graduated from a 7-year school and passed the entrance examination. During the last few years, admitted also are students who have completed secondary education (10-year school), and they have a two-year program, while those who entered from a 7-year school have a 4-year program. The two-year program concentrates on methodology, psychology, logic, pedagogical practice, etc. The entrance examinations are based on a program compiled by the Ministry of Education.

Pedagogical uchilishcha of the same type existed in Russia before the communist revolution of 1917, and they were called teachers' seminaries. The total number of these schools by Jan. 1917 was 170, including 26 women's schools; the total number of students attending these schools was 20 thousand. Each year they graduated 5-6 thousand. (Source: Medynskiy, "Prosveshcheniye v SSSR" (Educ. in USSR) 1955 p. 177) high quality teachers for elementary schools. The number of Soviet pedagogical uchilishch at the present time (Jan. 1956) is 357, that is only twice the number before the revolution, and they graduate (including about 2,500 correspondence school students) about 30 thousand teachers a year (this can be deduced from the total number of students graduating from technical schools - 312 thousands, and the

number of pedagogical schools - about 10% of the total, so if these statistics are true, the number of graduates from pedagogical schools each year is about 30 thousand ("Economy of USSR" Statistical Collection, 1956; p. 227, p. 229)).

If one compares the old teachers' seminaries with the Soviet pedagogical uchilishcha, one finds that only at the present time do the Soviet schools approach the old ones in the quality of teachers produced. One of the factors in this is that the pre-revolutionary teaching, even under tsarist despotism, was not doctrinary and one-sided as it is today with all biological, literary, political, social, etc. studies being permeated to the core with communist ideology to the absolute exclusion of all others. The old-time teachers could, therefore present his students with a less one-sided and stilted world outlook, and were not forced to give them a standard party line that many of them do not themselves believe in the least.

One may note at this point that western observers seem to forget that the high standard of some Soviet schools is not due to Soviet accomplishments. In fact the contrary is true. Until 1935 the soviet schools, due to their so-called trial of "ultra-modern" and "ultra-progressive" education, were steadily falling in quality until they reached an incredibly low state and only a thorough revision (with, of course, as always under the Soviet system, a thorough purge) of the whole system with a return to old-time teaching methodology and curriculum, started the schools on a rise in quality until today some of the results are high, though

still not as high as in the old-time schools, and with the dictatorial political and social one-sidedness being forced on education, they cannot reach the old time level, except in a purely academic way in the physical & mathematical sciences. Only with democratization and establishment of academic freedom can these schools become truly educational institutions and progress from where the old schools left off. And this is not in the least bit a vindication of tsarist despotism, but a condemnation of the Soviet system that with all its technical progress cannot attain the quality of education in tsarist schools.

"Economy of USSR" - Statistical Collection for 1956 has no direct reference as to the number of teachers working in elementary school and also in the first four grades of the semiletka and the desyatiletka, but on the basis of other material in the same publication one can calculate that by June 1956 the number of teachers in the said grades was around 680 - 750 thousand. Thus, on p. 223 of the said publication one finds that the total number of students in elementary, 7-year, and 10-year school in 1956 was 28.2 million, and there were 1655 thousand teachers; that is on the average there were 16.4 students per teacher. Since the average number of students per teacher in grades 1-4, is generally higher than for grades 5-10, the average number of students per teacher in these grades would probably be around 18-20. Page 224 of the said Statistical Collection indicates that the

number of students in grades 1-4 in 1955 was 13.6 million. From this it follows that the number of teachers in grades 1-4 was around 680 to 750 thousand. The veracity of these figures for teachers in grades 1-4 is further confirmed on p. 195 of the Statistical Collection (1956) in the number of actually employed teachers, library and cultural - educational workers, having had secondary education was 818.6 thousands on June 1, 1955. Obviously this figure includes all teachers of the first four grades of public school, whose highest educational requirement is graduation from a secondary school, and also some teachers in grades 5 - 7 of 7-year schools and 10-year schools who have completed only secondary school. Excluding from the total number the library workers, and educational-cultural workers (working in youth clubs, etc.) and the teachers in grades 5-7, the number of teachers working in grades 1-4 would be about 700 thousand.

Not all teachers in grades 1-4 have completed even secondary education. These teachers are by law, enrolled in the 92 correspondence sections of secondary pedagogical schools in USSR. The total number of secondary technical correspondence school student in USSR is 297 thousand. ("Economy of USSR" - Statistical Collection 1956 p. 227); of this about 20-25% are enrolled in pedagogical correspondence schools (about 60-65 thousand students). These pedagogical schools as a rule take only students who are actually engaged in teaching at the time. The percentage of teachers who now

have still not completed secondary education is now at least 10-15%, because of the increase in the population and the number of schools, and also because of a great influx of the better prepared elementary school teachers into the 5-7 grade of rural 7-year and 10-year schools, due to the establishment of compulsory 7-year education in rural areas. The graduates of secondary pedagogical uchilishcha are first of all taken by urban areas, so the rural areas are filled by comparatively lower quality teachers and are generally of considerably lower type, and the urban schools prepare students much better.

Another factor contributing to the low quality of rural schools and reflects negatively on the training of the students is the great economic poverty of rural residents, of which the author has had firsthand experience. One illustration of the very difficult material condition of peasants that the author has seen himself is the following. In 1940 two very good friends of the author's were teachers in a two-room school at Putivka village in Poltava County, Ukraine and the author's little son was staying with them for the summer. The author came there himself at intervals, bringing bread, salt pork, and other provisions from Kiev. Due to the perpetual state of semi-hunger among the "Kolkhoz" children who lived in the village and attended school, the author brought considerable quantity of food which the two teachers secretly distributed among the hungry children. To do so openly would

be to challenge the maxim that "life became better - life became happier" and would be a dangerous admission of the fact that the parents of the children could not feed them. And this in Ukraine, where the soil is, as is universally known, the best in the world for grain cultivation.

These two friends confided in the author that attendance during the cold winter months was low, but not because of a lack of interest in the students or a lack of care in their parents, but in a much more fundamental lack - a lack of shoes. The children especially of large families, tried very hard to get to school by sharing the same shoes. For instance if there were two pairs of shoes available, two children would come to the schoolhouse, but one of them would return home carrying the other pair of shoes in his hands to give to another child, who would then come to school, and if there were more children, the process continued. Some families, however, did not have even enough shoes even for that, and if the parents had to go to work, the children simply couldn't come. The author contributed two pairs of shoes to be thus circulated. During Spring, Summer and Autumn all rural children went barefoot. The teachers were very happy with these shoes not only from obvious human feelings, but doubly so, because teachers in whose schools the attendance was low were punished, and these shoes enabled them to have comparatively excellent attendance. They were later commended for this by the authorities.

This was by no means exceptional, such conditions existing throughout the Soviet Union.

In spite of all handicaps, the teachers finishing secondary pedagogical "uchilishcha" are well prepared for their duties and in the cities where the better teachers are placed, and where the residents are materially much better off than the peasants, the schools give an undeniably positive result and the quality of training is high. This is especially true in capital cities like Moscow, Leningrad, Kiev, etc. The rural schools however, because of the severe handicaps mentioned, graduate much poorer quality students. Especially excellent schools with the best teachers and excellent equipment are established in Moscow, Leningrad, etc., for the amazement and admiration of them by foreign visitors, whose opinion of Soviet education would be somewhat different if they chanced to visit a real rural school. If they did, the ravings about Soviet scholastic excellence would not exist in the American newspapers. The Soviets are excellent propaganda artists, and to obtain the best equipment in the world for a few schools is not too hard, so their purpose is easily accomplished. It is astounding, however, to see the intellectual stature of visitors whom they managed to fool, and who do not realize that Moscow and Leningrad are not by far the whole of USSR.

One must note, however, that many Soviet elementary schools in the cities prepare students with high quality

academic knowledge who go on to secondary and higher education. The gap between the schools in large cities and large industrial areas and all the others is, however, very great, and very few rural students have any chance at all of getting higher education, and as a result a privileged class of urban residents is being more and more firmly established. Institutions of higher education, which are comparatively few, will, therefore always have enough good students drafted from good schools in the cities selected by competitive examinations, to assure high quality in the higher educational system. The children of peasants, however, become themselves peasants. The same situation exists also among poorer industrial workers, who, even if the tuition is free, cannot afford to give them higher education because they cannot afford to give them material support while they study. These children are forced to enter into the industry at a comparatively early age to help support the family.

The results of urban elementary school education in USSR (4 grades) are near to the results of elementary education in the USA (6 grades). This is in part explained by the fact that children in USSR enter school a year later than in the USA, the Soviet kindergarten playing a more important role in USSR than in USA, and also that the USSR has 6-day a week attendance in school, as opposed to 5-day in the USA.

## C) The 7-year school (semiletka)

By decree of TsIK and SNK SSSR (Central Executive Committee and Soviet of People's Commissars of USSR) on August 14, 1930 compulsory elementary school education was put into effect in the whole Union, and 7-year education in urban centers. ("Narodnoye Obrazovainye", 1948, p.25, L. of C. call no: LAW KR 2280 .A2 1948). The second 5-year plan (1933-1937) extended compulsory 7-year education in the urban centers had already been accomplished. Point "e" of the plan states:

"to accomplish during the second five-year plan not only the liquidation of illiteracy among the people of the Union, liquidation of semi-illiteracy among the working adult population and establishment of universal elementary education, but the realization of universal compulsory polytechnical education in the sphere of 7-year education, especially in the rural areas, as in cities this problem has been basically already solved during the first five-year plan."

Actually, however, universal 7-year education in rural areas did not even begin to be in effect until 1949, and even in the cities it was not fully accomplished by 1949. This is indicated by the fourth 5-year plan.

The fourth five-year plan (1946-1950) states:

"to raise the number of elementary 7-year and 10-year schools by 1950 to 193 thousand, and the number of students in these

schools to 31.8 million, providing universal compulsory education of children from the age of 7 on, in the cities as well as rural areas."

Narodnoye Obrazovaniye No.1, January 1950 (an official publication) states on p. 16: "(The fourth five-year plan) of 1949 had considered the promotion of all children in the rural areas to the fifth grade who had completed elementary school that summer. In order to fulfill this tremendously important government directive in all rural areas a great deal was done to extend the network of 7-year schools, to staff these schools with teachers, to widen and better equip the existing dormitory facilities and establish new ones. A great deal was done also to explain to the students their parents, and the entire rural community the political and cultural meaning of transition to universal 7-year education...
As a result of great organizational and propaganda-explanatory work among the population, on September 1, 1949, 97.2% of all students who graduated that summer from the fourth grade of urban and rural schools had enrolled into the fifth grade."

These quotations clearly indicates the fact that the transition from 4-year to 7-year compulsory education was not even begun until 1949, and the statements made in the second five-year plan (1933-1937) as to the establishment of universal 7-year education in rural areas by 1937, had no connection with reality.

This indicates the propagandistic nature of the five-year plans, and shows of what little value they are, except in an indirect manner, in studying Soviet reality.

The transition of rural areas to 7-year compulsory education (in 1949) was conducted without a preliminary preparation as to buildings, teachers and equipment, and as a result, the 7-year schools were established in the existing elementary schools with the same elementary school teachers, making it necessary to run the school in two or three shifts a day. Confirmation of this comes from the same article in Narodnoye Obrazovaniye, No.1, 1950, p.16 (Some questions on 7-year education): "However, the administrations of public education could not supply all the newly accepted students with classroom space. Therefore the number of schools working in two shifts was increased, and some schools were forced to conduct studies in three shifts."

Additional teachers were drafted from among the more prepared elementary school teachers elsewhere as was already mentioned previously.

Further confirmation of this comes from the same article on p.16 of Narodnoye Obrazovaniye:

"Great difficulties arose also with the selection of teachers in the newly organized 7-year rural schools. In most sections (kray, oblast', and autonomous republics) for teaching in the new fifth grades elementary school teachers

were drafted. Also in some newly opened schools (for instance in Penzensk oblast') for teaching in the fifth grade were drafted teachers of the elementary schools in the area where the 7-year schools were established /forcing them to teach in both/."

The same article indicates that some students are forced to go to school a distance of 6 to 10 kilometers, and some even more than 10 kilometers (more than 6.2 miles). Since transportation for these children is not available, they are forced to walk, and since proper clothes, shoes, etc., are not available, many children are frequently absent from schools especially during the winter months due to cold, spring - due to impossible road conditions, etc.

Due to these conditions, and also the inferiority of teachers forced to teach in higher grades than they are qualified for and forced to teach subjects that they are not acquainted with, the quality of students is poor.

The following quotation from Narodnoye Obrazovaniye, No.1, 1950, p.17, serves to examplify the fact that part of the teachers in grades 5-7 have only completed secondary school:

"In Stalingrad oblast', in the extension of the network of 7-year schools, in connection with the transfer to compulsory 7-year education in rural areas, 190 teachers were needed - 112 teachers of the Russian language and 78 teachers of mathematics. These teachers were drafted from a number of the better prepared elementary school teachers."

The requirement for elementary school teachers being the completion of a secondary school, the teachers drafted in this case to teach in grades 5-7 were also ones who only completed secondary school, especially in view of the fact that teachers do not choose their schools but are appointed, so even if a teacher who has had higher education wanted to teach in elementary school in spite of the lower salary, he could not do so.

"Ordinary" (full-time) teachers of the 5th to 7th grades in USSR must graduate from a "teachers' institute" (at the present time (1955-56) some changes were made which will be dealt with later). Therefore all elementary school teachers forced to teach in the 5th to 7th grade of the 7-year school had to enroll in a correspondence division of a teachers' institute. Teachers' institutes graduated teachers of the following four specialities: Russian language and literature; physics and mathematics; nature study and geography; history.

To receive full pay, each teacher must teach at least 18 hours a week. According to the curriculum of 5-7 grades of 7-year schools, this is possible in small schools for teachers of only two specialities; Russian language and literature, and mathematics and physics. In history, for instance, there are only 8 hours a week available, in geography and nature study - 15 hours. Thus, history teachers have to take on the responsibility to teach other subjects, for instance foreign language, physical culture, drawing, drafting,

singing, i.e. responsibilities for which they are not prepared. Such difficulties are, of course, not faced by larger urban schools, which as a rule have several sets of classes for each grade. Rural 7-year schools, however, with one set of classes, mostly have for these classes only two teachers, who during class hours conduct two classes each at a time, and equally divide between them the available hours. It is obvious that such a system leads to lower quality of preparation in the students. The students graduating from such a school have considerably less chance of passing the entrance examinations into professional secondary schools, compared to students who have graduated from urban 7-year schools.

The quality of learning in the 5-7 grades of the 10-year schools, is without a doubt higher than in the 5-7 grades of 7-year schools, especially in 10-year schools in the cities, where high quality teachers, shop equipment, etc. are available. Rural 10-year schools are also somewhat higher in quality, but not much higher due to lack of buildings, laboratories and shops, and poorer quality of teachers as well as poorer preparation of the students by rural elementary schools.

The old and the new curricula of the 5-7 grades of the 7-year school (1951/52 and 1955/56) are shown in table 9. The source for the old curriculum was Ye. N. Medynskiy "Narodnoye Obrazovaniye v SSSR," (Education in USSR) Moscow, 1952, p.74; the source for the new one was "Narodnoye Obrazovaniye" No.9,1955, p.49.

TABLE 9

Number of hours per week

| Name of Subject | V grade | | VI grade | | VII grade | | Total No. of hours in course | |
|---|---|---|---|---|---|---|---|---|
| | old | new | old | new | old | new | old | new |
| Russian language and literature | 10 | 9 | 8 | 8 | 6 | 6 | 799 | 766 |
| Mathematics (arithmetic, algebra, geometry) | 7 | 6 | 7 | 6 | 6 | 6 | 660 | 594 |
| History | 2 | 2 | 3[2] | 2 | 2 | 2 | 215 | 198 |
| Constitution of USSR | — | — | — | — | 2 | 2 | 66 | 66 |
| Geography | 3 | 3 | 2[3] | 2 | 2[3] | 3 | 264 | 264 |
| Biology | 2 | 2 | 3 | 2 | 2 | 2 | 231 | 198 |
| Physics | — | — | 2 | 2 | 3 | 3 | 165 | 165 |
| Chemistry | — | — | — | — | 3[2] | 2 | 82 | 66 |
| Foreign language | 4 | 4 | 4 | 4 | 3 | 3 | 363 | 363 |
| Physical culture (gym. etc.) | 2 | 2 | 2 | 2 | 2 | 2 | 198 | 198 |
| Drawing (freehand) | 1 | 1 | 1 | 1 | | | 66 | 66 |
| Drafting | | | | | 1 | 1 | 33 | 33 |
| Singing | — | 1 | — | 1 | — | — | — | |
| Practical occupation (work in the fields and shopwork) | — | 2 | — | 2 | — | — | — | 132 |
| TOTAL | 31 | 32 | 32 | 32 | 32 | 32 | 3136 | 3168 |

The new curriculum for 7-year schools, (1955-56) given here in table 9 for only the 5th, 6th and 7th grade, in comparison with the old one (1951/52), because the curriculum for the first four grades was given earlier, and the curricula of the first four grades of elementary school and 7-year school are identical. The new curriculum was formed at the directive of the 19th Congress of the Communist Party on the establishment of "polytechnical education" in schools of general education. As seen from table 9, the new curriculum for the 5-7 grades of the 7-year school differs from the old only in the inclusion of "practical occupation" classes - two hours a week in the 5th and 6th grade, and singing lessons - 1 hour a week in the 5th and 6th grades. This was done at the expense of diminishing the number of hours of mathematics in the 5th and 6th grades by 1 hour a week, diminishing the Russian language by 1 hour a week, chemistry in the 7th grade by ½ hour a week, and biology in the 6th grade by 1 hour a week. From this follows that "polytechnization" of the 5-7 grades was effected only by the inclusion of "practical occupation" - shopwork and work in the fields, unless one is to consider the addition of singing lessons as effecting "polytechnization," which is somewhat doubtful, to say the least.

Since there are no shops in most of the schools and no shop teachers as well, the positive effects of "polytechnization" if any, will be very slight in the near future as well as the present. The resulting dimunition of the number of hours

devoted to mathematics, chemistry, physics, and biology by 32-37% will, however, have a clearly negative effect on the proficiency of the students in these subjects.

## D) Teachers' Institutes

The training of teachers for the 5-7 grades was, before 1917, accomplished by 17 so-called teachers' training institutes with a three-year curriculum. The students of these teachers' training institutes were usually graduates of teachers' seminaries (now called pedagogical uchilishcha), after they had been teaching for several years in elementary schools. Teachers' institutes gave very good training. Aside from ordinary subjects, here were taught: psychology, pedagogy, and methodology. Pedagogical practice was very well organized and gave excellent results. Women, however, were not accepted into the teachers' institutes.

Even though teachers' institutes were not considered as higher educational institutions in pre-revolutionary Russia, they were nevertheless truly important educational centers of high-quality pedagogical training.

With the establishment of Bol'shevik power, these institutes were transformed into 4-year institutes - the so-called"higher educational institutes" (Instituty Narodnogo Obrazovaniya) with facul'tets for training of teachers for 5-7 grades. In 1935, when a sharp turn was taken to revert to pre-revolutionary teaching modes, teachers' institutes were reestablished with a two-year curriculum, for the preparation of teachers for the 5-7th grades. Teacher's institutes admitted students between 1935 and 1948 who had graduated from the 9th grade. The training of teachers in such two-year teachers'

institutes was notably of lower quality than that accomplished by the old-time institutes, besides which academic freedom was also very much taken away, and the students were compelled to study the history of the Communist Party and historical dielectic materialism, conforming with Marx - Engels - Lenin theories, and other subjects with view of communistic indoctrination of future teachers. In 1944 the statutes of the teachers' institutes were changed, and according to the new plan, they were enjoying the rights of full-fledged higher educational institutions, even though they were not so in actuality. The students accepted had to be graduates from the 10-year school. Curricula were studied, and for the first time a complete uniform curriculum was planned for teachers' institutes with uniform textbooks put to use. By statute, each teachers' institute to provide practice for student teachers, had by it an experimental 7-year school. But even after this reform the quality of teacher training could not reach the pre-revolutionary level. Some of these institutes existed independently, while others were departments of 4-year pedagogical institutes, which existed to provide teachers for grades 8-10. Teachers' institutes that were departments of 4-year pedagogical institutes were of better quality than the independent ones. Since the former could use the room and laboratory facilities of the pedagogical institutes and also was supplied with better quality pedagogical personnel, they provided a higher quality of training.

In 1945 there were 196 teachers' institutes, 106 of which were independent, but starting with 1953, there began a transformation of teachers' institutes into 4-year pedagogical institutes, which up to that time prepared teachers for only the 8-10 grades of 10-year schools (Medynskiy, "Narodnoye Obrazovaniye," 1955, pp. 182-184).

Handbook for enrollment into Institutions of Higher Learning in the USSR in 1956 (Spravochnik) Moscow, 1956, where are named all institutions of higher learning in the Soviet Union by Jan 1, 1956, (except military) indicates that in 1956 in USSR there were only 5 teachers' institutes:

1) Karshi Teachers' Institute, Karshi Uzbek SSR, ul. Kuchabag 17 Specialities: Uzbek language and literature; Russian language and literature; history; physics and mathematics. There is a correspondence section - in the same specialties.

2) Leninabad Women's Teachers' Institute, Leninabad Tadzhikskaya SSR, ul. Ordzhonikidze 126. Specialities: Tadzhik language and literature; Uzbek language and literature; history; physics and mathematics; nature study and geography.

3) Novaya Vil'nya Teachers' Institute. Novaya Vil'nya Lithuanian SSR, ul. Krokuvos 5. Specialities: polish language and literature; Russian language and literature; history; physics and mathematics; nature study and geography. There is a correspondence section in the same specialities.

4) Samarkand Tadzhik Teachers' Institute im. S. Ayni, Samarkand Uzbek SSR, ul. Lenin 57. Specialties: Tadzhik language and literature; Russian language and literature; physics and mathematics.

5) Termez Teachers' Institute, Termez Uzbek SSR. Specialities: Uzbek language and literature; Russian language and literature; history; physics and mathematics; nature study and geography.

Thus in 1956/57 school year in USSR there will be working only 5 teachers' institutes: 3 in Uzbek SSR, 1 in Tadzhik SSR and 1 in Lithuanian SSR.

What was it that caused the disappearance of teachers' institutes of a very important link in the system of preparation of manpower for general education in USSR, and their replacement by 4-year pedagogical institutes? Officially it is explained in terms of liquidation of parallelism in higher educational institutions of USSR in the preparation of specialists (including teachers), and also by the necessity to produce more highly qualified teachers for the upper grades of schools of general education, including 5-7 grades of the 7-year schools, and by polytechnization of schools of general education, as decreed by the 19th congress of the Communist Party of USSR.

The educational level in urban 7-year schools in USSR, where higher quality teachers and equipment are available is in general somewhat higher than that of Junior High schools in the USA, especially in physics mathematics and chemistry,

even though American students have to spend 9 years for the same training in USSR in 7-year school plus 1 year of kindergarten. This is explained by the fact that in USSR the students attend school 6 days a week, which about in 9 years makes 1 and 2/5 of a year more than if it was 5 days a week, and because the curriculum devotes more attention to these subjects than in the USA.

## E) THE 10-YEAR SCHOOL

The curricula of the first 7 grades of the 10-year school are identical to those of the 7-year school. As the 7-year school curriculum was discussed earlier, the following discussion shall concern only the last 3 grades. The old curriculum (1950/51) given in Medynskiy, "Narodnoye Obrazovaniye v SSSR" 1952, p. 86; and the new curriculum (1955/56) given in Narodnoye Obrazovaniye No. 9, 1955, p. 49; are compared in table 10.

The polytechnized curriculum for 1955/56 differs from the old curriculum for the same grades of 1950/51 by the fact that the new curriculum has 83 hours more physics than the old plan, and besides this a new subject - "practice in farming, machinery, and electricity" (149 hours) - was introduced. This, together with the physics comprises 232 additional hours of study. This increase was made at the expense of a decrease in the number of hours devoted to literature - 100 hours less, nature study - 50 hours less, psychology - 33 hours less. The new plan also completely eliminates the study of logic - 66 hours, which altogether adds up to 249 hours less, and so the new plan calls for 17 hours less than the old one. The polytechnization of the new curriculum for grades 8-10 was thus expressed by an 83 hour increase in physics, and the inclusion of 149 hours of "farm practice, etc"

TABLE 10

| Subjects | No of hours in previous grades | | No of hours per week per grade | | | | | | Total No of hours | |
|---|---|---|---|---|---|---|---|---|---|---|
| | old | new | 8 gr old | 8 gr new | 9 gr old | 9 gr new | 10 gr old | 10 gr new | old | new |
| Russian language and literature; reading | 76 | 71 | - | - | - | - | - | - | 2508 | 2343 |
| Literature | - | - | 5(6) | 6(5) | 6 | 4 | 5 | 4 | 544 | 444 |
| Arithmetic | 35 | 33 | - | - | - | - | - | - | 1156 | 1090 |
| Algebra, geometry, trigonometry | 11 | 9 | 6 | 6 | 6 | 6 | 6 | 6 | 957 | 891 |
| Nature study (old) biology (new) | 9.5 | 8 | 2 | 2 | 2 | 1/2 | - | - | 445 | 395 |
| Constitution of USSR | 2 | 2 | - | - | - | - | - | - | 66 | 66 |
| History | 9.5 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 709 | 660 |
| Geography | 10.5 | 10 | 3 | 3 | 3(2) | 3(2) | - | - | 528 | 512 |
| Physics | 5 | 5 | 3 | 3 | 2 | 4 | 4(5) | 5 | 478 | 561 |
| Astronomy | - | - | - | - | - | - | 1 | 1 | 33 | 33 |
| Chemistry | 2.5 | 2 | 2 | 2 | 2 | 2 | 4(3) | 3(4) | 330 | 314 |
| Psychology | - | - | 2 | 1 | - | - | - | - | 66 | 33 |
| Logic | - | - | - | - | - | - | 2 | - | 66 | — |
| Foreign Language | 11 | 11 | 4(3) | 3 | 3(4) | 3 | 4 | 3 | 726 | 693 |
| Physical education | 12 | 14 | 2 | 2 | 2 | 2 | 2 | 2 | 594 | 660 |
| Drawing (freehand) | 6 | 6 | - | - | - | - | - | - | 198 | 198 |
| Drafting | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 132 | 132 |
| Singing | 4 | 6 | - | - | - | - | - | - | 132 | 198 |
| Work and practical occupation | - | 10 | - | - | - | - | - | - | - | 330 |
| Farming practice & machine practice | - | - | 1(2) | - | 2 | - | 2 | - | - | 149 |
| TOTAL | 195 | 193 | 32 | 33 | 33 | 33 | 33 | 32(33) | 9669 | 9652 |

indicated above.

Farm practice is intended for schools at collective farms, and machinery and electricity for city schools. It is doubtful that such polytechnization of 8-10 grades of rural schools will give significant results, if one is to note the low state of agriculture on contemporary collective farms in USSR. Practically it will be reflected in that students in grades 8-10 instead of resting during the summer, shall work in the fields and on the farms, and on Sundays in the fall semester shall work gathering the harvest (potatoes, beets, etc.) on collective gardens, and also work plowing, which was actually what they were doing before the establishment of the ~~collectivization~~ polytechnization plan. Thus, for instance, in the official publication of the Ministry of Education (Narodnoye obrazovaniye No. 8, 1954 p. 54) it is noted: "Many students of our school (Zemlyanskaya srednyaya shkola voronizhskoy oblasti) take part during the summer in collective farm work, and work 30,50, and more full workdays." This, by the way, refers to children 14-16 years of age, whose "vacation" during which they do this lasts only two months.

Practice in machinery and electricity in urban schools (149 hours) will have significant results only in schools that have sufficient equipment, and teachers qualified to teach it.

In general the polytechnization is only in the initial stage of execution, and how far it will go only the future will show.

Secondary schools of general education had, in the old plan, one aim, and that was to prepare students for higher education. Now, however they have to perform the additional function of supplying workers for industry and agriculture. This was due to the increase in numbers of 10-year schools, especially in the cities, the number of graduates of which exceed the higher education facilities available. Therefore it is necessary to prepare students for practical technology and also probably the military.

The number of 10-year schools shall continue to grow. According to the fifth five-year plan, in 1951-55 there should have been accomplished complete conversion to universal 10-year education in the larger cities, and according to the sixth five-year plan for 1956-60, there should be completed: "universal secondary education in (all) cities and rural areas, through teaching children and youth in secondary schools of general education (10-year schools) and secondary special (professional) schools. To develop polytechnical education in academic schools, by acquainting the students with the most important branches of contemporary industry and agriculture." (The newspaper "Izvestiya" for Feb. 26, 1956, p. 6, col. 1)

The establishment of universal 10-year secondary education in larger cities of the Union, intended by the fifth five-year plan (1951-55) was not accomplished due to the necessity to pay tuition in the 8-10 grades of academic schools and

all grades of special (professional) schools, which made such education prohibitive to children of poorly paid workers. Only in 1956/57 tuition shall be free in all grades of the aforementioned secondary schools, and also in higher educational institutions (same source as above). The universal secondary education was not accomplished also due to the fact that the existing number of secondary general and special schools is insufficient to accommodate all graduates of 7-year schools. Therefore during the sixth five-year plan the number of schools in larger cities should increase. As was noted above, in other cities and in rural communities universal secondary education should be completed in 1956-1960, but one can safely say now that this problem, especially in rural communities, cannot be solved in the given time because of the following:

1) It is urgently necessary to erect many new school buildings for 8-10 grades of 10-year schools, and equip them. By the way according to the 20th congress of the Communist Party: "Kolkhozi (collective farms) must take a wider part in constructing and equipping of schools and dormitories." (Same source as above). In the contemporary economic position of the collective farms, it will be impossible for them to build school buildings for the number of schools necessary (In cities and towns construction of schools is financed by the government).

2) The absence of the number of teachers necessary to supply the great numbers of new 10-year schools.

3) Farmers, due to poverty, shall not be able to send their children to distant 10-year schools, where they would have to pay for their subsistence in dormitories, for their clothes, and for their books and school supplies. As was already noted above, 7-year universal compulsory education was supposed to have been attained in the second five-year plan, while in actuality in rural areas it was only begun 17 years later - from 1942 and is still not completed. Establishment of universal 10-year compulsory education in rural areas, is therefore a question of the distant future - at least 30-40 years, if it can ever be attained under slave-labor conditions of Soviet collective farms.

In grades 8-10 of Soviet 10-year schools a great emphasis is given to mathematics, physics and chemistry, approximately 37% of the total number of hours in the curriculum. The teaching of mathematics emphasizes the relationship between theory and practice. The students must apply their mathematical knowledge to the solution of problems from physics, mathematics, astronomy etc... Physics in grades 8-10 is taught beginning from mechanics - kinematics, statics, dynamics. A great deal of time is devoted to hydro- and avio-mechanics. After mechanics follows study of heat, molecular physics, change of

state, gas state physics, electricity, optics, acoustics, atomic structure. The studies of physics in grades 5-7 is accompanied by demonstrations, and a small number of laboratory exercises for the students. In grades 8-10, a great deal more time is devoted to laboratory work.

The physics course, according to the new plan, must be closely related to practice in electricity and machinery.

The chemistry given in grades 8-10 is mostly inorganic, and some concepts of organic chemistry are also introduced. One must note that not all 10-year schools, in fact, only a comparatively small number of them, especially in rural areas, have properly equipped physics and other laboratories. Therefore good results in study of physics and chemistry are accomplished mostly in large cities and in model 10-year schools which exist mostly to impress foreign visitors.

A great deal of attention is devoted in cities where are universities or large pedagogical institutes, to mathematical "olympic games." Thus in the magazine "Uspekhi Matkematicheskikh Nauk," Vol. 8, No. 5/58, 1953, pp. 163-168 are given problems which were presented at the mathematical olympic games in Stalingrad for students in the 9th grade at the second round of the contest. One of them is the following:

Prove the identity:

$$\frac{1}{\log_x 2 \log_x 4} - \frac{1}{\log_x 4 \log_x 8} - \frac{1}{\log_x 8 \log_x 16} - \dots - \frac{1}{\log_x 2^{n-1} \log_x 2^n} = (1 - \frac{1}{n})(\frac{1}{\log_x n})^2$$

The 10th grade students were given the following:

Solve for x in terms of a and b and determine the relationship between a, b, and x (what happens when a increases,,etc.)

$$(x - 1a^2)^5 - (x - 1b^2)^5 = (x - 1b^2)^5 - (x - 1a^2)^5$$

At the Moscow mathematical olympics in 1952 for students of the 10th grade at the second round the following problems was given:

Prove that the sum:

$$\cos 32x + a_{31}\cos + a_{30}\cos 30x + \ldots + a_1\cos x$$

can take on negative as well as positive values.

From this, of course, it does not follow that such problems could be solved by students of the said grades in all 10-year schools of the USSR. These problems were solved by the best students of some 10-year schools of large cities. These olympics are significant, however, because a large number of students attended them. Thus for instance in the first elimination round of the aforementioned olympics of the city of Stalingrad, 1019 students of grades 7-10 entered, and 804 students qualified to the second elimination. In the first round of the Moscow olympics 1500 students took part, (Uspekhi mat. nauk vol. 8, No. 4/56 pp. 194-197) of which 770 were admitted to the second round. Of these 282 qualified for the second round by solving these and other problems. Such olympics,

as was mentioned before, are held in all large cities having universities or large pedagogical institutes. Preparation to these olympics is usually directed by the mathematics departments of the universities or pedagogical institutes. Judging by the quality of the participants in these olympics, and their results, the mechanical-mathematical departments and physical-mathematical departments of universities and pedagogical institutes in cities where the above olympics are held are amply supplied with qualified students, with good mathematical backgrounds supplied by the extra training given by some 10-year schools which prepare students for the olympics. These olympics conducted in USSR, doubtless play a significant role not only in the preparation of students for successful work in universities in physics-mathematics departments, but also in the selection within the universities of the more talented among them for preparation, after graduation to the first scientific degree - Candidate of Physical-Mathematical Sciences.

TABLE 11

| School Years | Number of 10-yr schools | Total number of students in all grades | No. of students in grades 8 - 10 | | Average number of students per school | No of students in the 10th grade |
|---|---|---|---|---|---|---|
| | | | In cities and rural areas | Among them in rural areas | | |
| 1914/15 | [illegible],953 | 635,591 | — | — | 325 | — |
| 1933/34 | 2,436 | 2,011,798 | 138,677 | 15,084 | 822 | — |
| 1938/39 | 12,469 | 9,028,156 | 1,408,846 | 548,757 | 724 | — |
| 19[illegible] | 18,800 | 12,200,000 | 2,370,000 | 1,000,000 | 650 | 450,000 |
| 1950/51 | 15,000 | 10,200,000 | 1,500,000 | 640,000 | 680 | 290,000 |
| 1954/55 | 25,200 | [illegible],200,000 | 5,140,000 | 2,280,000 | 603 | 1,100,000 |
| 1955/56 | 26,900 | 15,100,000 | 5,250,000 | 2,370,000 | 550 | 1,300,000 |

Table 11 was conctructed on the basis of data published for years 1914 to 1939 in "Prosveshcheniye v SSSR", by Ye. N. Medynskiy (Education in USSR), 1955, p. 81, and for years 1940 to 1956 in "Statisticheskiy sbornik" (Statistical Collection), Moscow, 1956 p. 223. From this data the following conclusions may be drawn.

The difference between the numbers of schools in year 1914 to 1933 is about 500 schools, and the difference between the numbers of students attending these schools is about 1.5 million, which is contradictory if one takes into account that for 1953 schools - 635, 591 students and for 500 additional schools - 1,500,000 students, that is the increase in the number of students per school is too great to be possible. Also the average number of students per school was in 1914 - 325 and in 1934 - 822. Since the room facilities were about the same as before, it follows that the only way such a thing could be accomplished would be by conducting school in 3 sessions. The data for the relative numbers of urban and rural 10-year schools is also of a highly dubious nature, indicating that between 1935 and 1955 many more rural 10-year schools were built than in the cities, almost equalling the numbers of schools in the cities. This is completely untrue since, as was shown before, the establishment of 10-year education in rural areas is only beginning at the present time.

It is very important to note that the quality of education given by general secondary schools existing in the Russian Empire before the revolution was not only not of a lower caliber compared to that of the contemporary Soviet schools of secondary education, but was actually of a higher caliber. This refers specifically to the physical-mathematical field and the foreign

languages. For instance analitic geometry, and differential and integral calculus were taught in the last grades (7th year - 10th year) of the pre-Soviet "real uchilishcha" (called elsewhere "real gymnazium"). These subjects are not now taught in any 10-year schools in the Soviet Union. Besides this elementary mathematics - algebra, geometry, trigonometry, were taught more thoroughly before the revolution being approached with more depth than they are now.

Students were better trained in the solution of problems in elementary mathematics, using specially written problem manuals. These "real uchilishcha" supplied the students for Higher technical schools, to enter which the students had to pass a difficult competitive examination, much more difficult than the entrance examinations to contemporary Soviet schools of higher education. Two languages - French and German were compulsory in "real uchilishcha" and the teaching was conducted on a high level - approximately on the level of contemporary Norwegian gymnaziums. Foreign language teachers were trained in foreign countries, and were highly qualified.

In contemporary Soviet 10-year schools only one foreign language is mandatory, and the teachers teaching it are deprived of the possibility of studying foreign countries, and are of a consequently low caliber; many Soviet secondary school teachers did not even receive any special language training in a foreign language teachers' institutes as it is often noted in official publications of the Ministries of Education.

As a result foreign language teaching is continued in higher education, which did not have to be done before. The programs of all "real uchilishcha" were identical throughout the Russian empire, all teachers had to be graduates of higher educational institutions, and all material facilities were alike throughout, so the quality of education in small towns did not differ from that in large cities, and the graduates had the same chance of entering into institutions of higher learning no matter where they came from, while now the difference between rural and urban education is very great, as was shown before, and the graduates of city schools have much more chance of continuing their educations than the rural students. Religion was taught in the "real uchilishcha", but was compulsory only to the students who were of a religion. Jewish and catholic students, for instance, were exempt from religious studies of the Russian Orthodox church. Very little time was devoted to religion, and teachers of other subjects - biology, physics, etc., were not forced to accept church doctrines, and so enjoyed a measure of academic freedom which does not exist in the Soviet Union today, when party doctrine is forcibly imprinted on all studies, notably of nature, biology, etc., and every teacher must conform or be sent to Siberia. Religion in higher educational institutions was not compulsory for anyone. So the supposed domination of pre- Soviet education by the Orthodox Church, stressed so insistently by the Soviet propaganda published in the 1950 edition of Encyclopedia Americana (see Vol. 27, p. 239g) as the truth, is pure fiction.

The second type of secondary school of general education in pre-Bolshevik Russian Empire was the gymnazium - where humanities were stressed, as opposed to the stress on the sciences in the "real uchilishcha". In gymnaziums three foreign languages were compulsory - Latin, French, and German. In some of them, called classical gymnaziums four languages were compulsory - Greek, Latin, French, German. The level of mathematical and physical teaching in the gymnazium is about equal to that of the better contemporary Soviet 10-year schools in large cities. The teaching of languages in the gymnaziums, being held on a high level, allowed the students of higher grades to read classical literature in original form. The study of literature was very broad, not centered on Russian literature, and presented in total academic freedom.

In Soviet schools, however, the students cannot read original classics, and read selections published in Russia, which the authorities deem as harmonious with Marxism-Leninism. Thus 10-year school students cannot study humanities in any real sense, but are isolated from all forms of thinking except the official communist propaganda.

The gymnaziums, like the "real uchilishcha", were all of an equal level regardless of where in the Russian Empire they were, and all students had an equal chance to enter Universities. The gymnazium students were also eligible to take the entrance examinations into technical higher educational institutions, even though their preparation in the sciences was lower than that of

"real uchilishcha". In order to graduate, all students of gymnaziums had to take a special "maturity examination", which were written by special committees of teachers headed by the supervisor of schools of a region (popechitel' uchebnogo okruga), thus an equal level of knowledge was required to graduate. Beginning in 1944, the same type of test was instituted in the Soviet Union, distributed likewise from central sources - Ministries of Education of Union republics. One of the greatest faults with the tsarist educational system was the tuition, which made it prohibitive to workers and peasants.

The Communists, thus received from the tsarist regime the heritage of a high-quality educational system and promptly proceeded to destroy it, through the following reforms.

The Decree of All-Russian Central Executive Committee of the Soviets from October 16, 1918 states in Paragraph 1: "All schools of the R.S.F.S.R. (the former name of all USSR) shall be renamed "One Labor Schools" (Note 2). The separation of schools on elementary, higher elementary schools, gymnazium, real uchilishche, trade schools, technical schools, commercial school, and all other forms of elementary and secondary schools, shall be abolished"...(paragraph 2) "One Labor School" is divided into two parts - the first for children from 8 to 13 years of age (a five-year course) and the second for children from 13 to 17 years of age ( a 4-year course)" [from 1923 the "One Labor School" was divided into two parts the other way around - the first half being a four year course and the

and the second - five[. "(paragraphs 3-4) The schooling in the first and second halves of the ["One Labor"] school is free of tuition, compulsory and universal secondary education, by the way, is something that is not realized even today (as was pointed out earlier), and indeed cannot be realized in the near future. "(paragraph 5) In the schools of parts I and II coeducational system is established" (in 1944 segregation according to sex was reestablished, on the motives that coeducation did not give the desired educational effects, but in 1954 coeducation was reestablished on the very opposite motivation - that segregation by sex leads to undesirable effects, and coeducation is indeed a desirable feature)." (paragraph 17) "The assigning of homework and compulsory home projects is forbidden..." (paragraph 19)" All examinations, - entrance, promotion, and final - are abolished."

The Resolution of TsKVKP(b) (Central Committee of the Communist Party) of February 12, 1933, paragraph 2 b, repeals a circular letter from the "One Labor School" division of Narkompros (National Commissary of Education) of R.S.F.S.R. from August 1918, to the effect that: "textbooks must be totally banished from schools." It is interesting to note that letter was only repealed after 15 years of its being in effect.

Part V of the same Decree of October 16, 1918 of the Central Executive Committee of the Soviets states: "...All secondary educational institutions, and also schools resembling them in kind, governmental, public and private, are divided according to the following plan of division of men's gymnaziums:

the first three normal classes with (first three) preparatory (classes) are (hereby) converted into independent schools of level I, and are reconstructed on universal basis for the said level... Grades 4, 5, and 6, shall form schools of level II; the 8th grade is abolished." So the number of years in secondary school was diminished by one.

Among other notable reforms of that time was the firing and frequent exile or execution of all teachers of "bourgeoisie origin" (sons of priests, sons of landowners, sons of tsarist government workers who had titles, etc.) purely because of their birth, even though they cooperated fully and may have been excellent teachers. They were replaced by incompetent and unqualified persons, because none others were available. The methodology of teaching was changed to "ultraprogressive", the curriculum was greatly diminished, only one foreign language remaining taught. Religion was abolished and communist propaganda was instituted instead; the teaching of separate subjects was abolished, and the project method, the Dalton Plan and the "complex" method established. Discipline became voluntary - to be enforced by the students themselves.

The results of these curious reforms was felt very quickly. The graduates of secondary schools did not have enough preparation to continue in higher educational institutions, and Universities and higher technical schools had to drastically lower their entrance standards, the graduating engineers, doctors, etc. not knowing even elementary mathematics. Doctors for instance, did not know how to make out prescriptions in Latin, and were so poorly prepared as not to know arithmetic.

Old druggists often had to turn down prescriptions which called for doses highly poisonous to the patients. The general disintegration of education was so drastic as to necessitate equally drastic reforms to revert to the old-style educational system. Beginning with the Aug. 25, 1932 and July 1936 resolutions of the Central Committee of the Communist Party, a sharp reversion to the pre-Soviet educational system was effected. In 1930 the 10th year was added back to secondary education. The 1932 resolution returned the following: "the basic form of the organization of instruction in primary and secondary schools must be the recitation, with a careful classification of all pupils and a systematic schedule of studies." Grading and examinations were also returned. The 1936 resolution returned discipline to schools; even the tsarist practice of requiring students to wear uniforms was revived. In 1944-45 the pre-revolutionary system of "maturity examinations" was returned, and the pre-revolutionary practice of distributing gold medals to excellent students, formerly branded as "antimarxist" was reestablished. Discipline became quite severe and militaristic (much more severe than under tsarist regime). The sciences were emphasized once more, and the curriculum was increased and made more difficult. The "olympic games" in mathematics in large cities was established - positive innovation. In spite of all, however, the Soviet secondary education has in general not yet reached the tsarist level, and

it is doubtful that it can do so in the near future. However, comparing the level of secondary education in large cities of USSR with the secondary schools in the USA, it is evident that in physical-mathematical sciences the Soviet schools are quite superior. There is no need, for instance, to teach trigonometry, algebra, solid geometry, etc., in Soviet higher educational institutions, while in the USA most colleges are forced to teach them.

Table 12 shows the numbers of schools, students and teachers in various periods.

TABLE 12

Schools of general education in USSR for 1927/28 to 1955/56

| Types of schools \ Years | 1927/28 | 1940/41 | 1950/51 | 1954/55 | 1955/56 |
|---|---|---|---|---|---|
| Total number of schools (in thousands) | 118.6 | 191.5 | 201.6 | 197.7 | 195.3 |
| including: | | | | | |
| elementary | 108.8 | 125.9 | 126.4 | 111.1 | 108.8 |
| 7-year | 6.6 | 45.7 | 59.6 | 60.5 | 58.7 |
| 10-year | 1.8 | 18.8 | 15 | 25.2 | 26.9 |
| No of teachers in all these schools (in thousands) | 347 | 1216 | 1433 | 1620 | 1665 |
| No of students (in millions) | 11.5 | 34.8 | 33.3 | 29.6 | 28.2 |
| including: | | | | | |
| elementary | 8.4 | 9.8 | 7.5 | 3.6 | 3.6 |
| 7-year | 2.1 | 12.5 | 15.5 | 10.7 | 9.4 |
| 10-year | 0.9 | 12.2 | 10.2 | 15.2 | 15.1 |

Source: "Economy of USSR" - Statistical Collection 1956 - p 223

## F) Preparation of Teachers for Higher Grades of Secondary School-Pedagogical Institution

Teachers of the higher grades of secondary school are graduated by pedagogical institutes and universities.

1) Pedagogical Institutes

The pedagogical institutes have a four-year curriculum. In 1936 there were in USSR 99 pedagogical institutes with 73,817 students. In 1941 there were 112 pedagogical institutes. By September 1, 1946 the network of pedagogical institutes was as is shown in table #13.

Table #13

| Republic | Total No. of Pedagogical Institutes | |
|---|---|---|
| R.S.F.S.R. | 65 | |
| Ukrainian SSR | 20 | |
| Belorussian SSR | 5 | |
| Azerbaydzhan SSR | 2 | |
| Georgian SSR | 5 | |
| Armenian SSR | 3 | |
| Turkmen SSR | 1 | |
| Uzbek SSR | 7 | |
| Tadzhik SSR | 2 | |
| Kazakh SSR | 6 | |
| Kirgiz SSR | 1 | |

Table 008 Cont'd.

| | | |
|---|---|---|
| Karelo-Finnish SSR | - | |
| Moldav SSR | 1 | |
| Latvian SSR | 1 | |
| Lithuanian SSR | 1 | |
| Estonian SSR | - | |
| TOTAL | 120 | |

Aside from this there were in Moscow: Pedagogical Institute of Foreign Languages, Music Pedagogical Institute, Pedagogical Institute "Tsentrosoyuz". Thus, there were in USSR in 1946 123 pedagogical institutes, with 79,000 students. (N. N. Medynskiy, "Prosveshcheniye v SSSR" Education in USSR, pp. 183-5)

By January 1, 1956 in USSR there were 222 pedagogical institutes including 4 correspondence institutes, whose specializations are indicated in table [illegible].

Table [illegible]

| Pedagogical Institutes | Total No. | No. of Evening Depts. | No. of Corresp. Depts. |
|---|---|---|---|
| Pedagogical Institutes preparing teachers for 1 subject | 4 | - | 3 |
| Pedagogical Institutes preparing teachers for 2 subjects | 35 | 1 | 31 |
| Pedagogical Institutes preparing teachers for 3 subjects | 28 | 1 | 23 |

Table ### Cont'd.

| | | | |
|---|---|---|---|
| Pedagogical Institutes preparing teachers for 4 subjects | 29 | 4 | 20 |
| Pedagogical Institutes preparing teachers for 5 subjects | 25 | 5 | 22 |
| Pedagogical Institutes preparing teachers for 6 subjects | 20 | 4 | 19 |
| Pedagogical Institutes preparing teachers for 7 subjects | 36 | 13 | 28 |
| Pedagogical Institutes preparing teachers for 8 subjects | 14 | 6 | 12 |
| Pedagogical Institutes preparing teachers for 9 subjects | 5 | 2 | 6 |
| Pedagogical Institutes preparing teachers for 10 subjects | 2 | 1 | 2 |
| Pedagogical Institutes preparing teachers for 11 subjects | 2 | - | - |
| Evening Pedagogical Institute preparing teachers for 6 subjects | 1 | (1) | - |
| Foreign language pedagogical institutes for 2 languages | 2 | - | 2 |
| Foreign language pedagogical institutes for 3 languages | 14 | 2 | 11 |
| Foreign language pedagogical institutes for 4 languages | 1 | 1 | - |
| Correspondence pedagogical institutes for 6 subjects | 1 | - | - |
| Correspondence pedagogical institutes for 7 subjects | 1 | - | - |
| Correspondence pedagogical institutes for 8 subjects | 1 | - | - |
| Correspondence pedagogical institutes for 9 subjects | 1 | - | - |
| TOTAL | 222 | | |
| Higher educational institutions of physical culture | 15 | 41 | 189 |
| TOTAL | 237 | | |

This table was compiled by the author from data in "Spravochnik dlya postupayeshchikh v vysshiye uchebnyye zavedeniya 1956" (Handbook for students entering higher educational institutions in 1956) Ministry of Higher Education of USSR. The data is completely accurate, because the handbook gives names and addresses of all the schools in question, and any fictitious names or omissions for propaganda purposes would be too evident to be published here.

The higher educational institutions of physical culture were included in the table since they prepare physical education teachers for secondary schools.

Among the 222 pedagogical institutes in USSR, by January 1, 1956, there were the following 6 women's pedagogical institutes:

1) Dagestan Women's Pedagogical Institute im. Gamzata Tsadasa

Makhachkala, ul. im. 26 Bakinskikh komissarov, 43

Specialties: Russian language and literature; mathematics.

2) Kazakh Women's Pedagogical Institute

Alma-Ata, ul. Mira, 113

Specialties: Russian language and literature; mathematics; geography.

3) Kirgiz Women's Pedagogical Institute im. V. V. Mayakovskogo

Frunze, ul. Dzerzhinskogo, 48

Specialties: Kirgiz language and literature; Russian language and literature; history; mathematics; geography; nature study and chemistry; English language; German language.

4) Kokand Women's Pedagogical Institute

Kokand Uzbek SSR, ul. Karla Marksa, 61

Specialties: Uzbek language and literature; Russian language and literature; history; pedagogy and psychology.

Correspondence department: the same specialties

5) Mary Women's Pedagogical Institute im. Y. V. Stalina

Mary Turkmen SSR, Ural'skaya ul., 63

Specialties: Turkmen language and literature; Russian language and literature; history; nature study and chemistry.

6) Stal'nabad Women's Pedagogical Institutes

Stalinabad Tadzhik SSR, ul. Lenina, 139

Specialties: Tadzhik language and literature; mathematics; nature study and chemistry. (Same reference source was used for this as for the preceding table.)

The presence of women's pedagogical institutes in the republics indicated shows that the Soviet government could not to this day liquidate the historical national traditions of segregation according to sex (women in these republics once had to wear veils, etc.) and had to comply with the antagonism of the population on this question in the republics indicated, to the extent of segregating education, even though the Soviet policies were quite stringent in that direction, and from the first days of Soviet government all institutions of higher education with the exception of some in these problematic areas were always coeducational.

Russification, however, was more successful in the areas indicated, as 3 out of the 6 women's pedagogical institutes

not having their own language, and 5 out of 6 having Russian language and literature as a specialty serves to confirm once again.

As seen from data shown above, the larger pedagogical institutes have several departments, including foreign language departments. Some of these pedagogical institutes, as for instance the ones in Moscow and Leningrad, have well-equipped laboratories and other facilities, as well as excellent teaching staffs. As a rule these institutes admit the better prepared students through competitive examinations, while the small provincial institutes with one-three specialties are badly equipped and have staffs with far lower qualifications than those of/the larger ones. The students in them are also of a poorer quality. Thus educational results on various levels of quality of the institutes are obviously unequal. The graduates of the bigger institutes normally are placed to work in large cities, while the others are placed in rural areas. A great deal of attention is devoted in pedagogical institutes to pedagogical practice and discipline. In the third-fourth year, the students have several weeks of uninterrupted pedagogical practice, teaching in the higher grades of nearby secondary educational institutions. Teachers of pedagogical institutes are present during the lectures of the students, and later, in conference, make suggestions as to methodology, etc. The total curriculum is composed of about 4000 hours, ten to twelve percent of which is devoted to pedagogical studies and practice.

Curricula and educational requirements of every subject are drawn up for pedagogical institutes by the Ministry of Higher Education of the USSR, and are consequently identical in each pedagogical institute where the subject is taught.

The pedagogical institute of USSR is a graduate as well as undergraduate school, without the distinction made in USA between undergraduate and graduate studies, and the curriculum includes the graduate as well as undergraduate studies in a single sequence. In mathematics, for instance, the pedagogical institute curriculum includes the theory of functions of real variables, theory of functions of complex variables, also probability, number theory as elective courses, etc. Besides these some courses are included, as for instance a special 402-hour special course on all elementary mathematics, taught in the third year, the program of which is on a high level, and for which there are textbooks written by the best mathematical specialists. The importance of this course is very great in preparing students to teach mathematics in secondary schools.

From 1945/46 compulsory "cursovyye raboty" (extensive scientific reports) were instituted for students of the second and third year. The marks given for these reports are equivalent in importance to final examinations. The aim of these reports is to deepen the student's knowledge of the particular subject, to get the student to learn scientific material on his own, to get him to determine for himself the most important points in the development of his theme, to acquaint the student

with scientific literature and teach him to extensively use and habitually read scientific monographs and periodicals. Vestnik Vysshey Shkoly No. 10, 1947, pp. 37-39 mentions some such reports in physics submitted by the Vologda Pedagogical Institute. Some of these are the following: "Neutron - discovery and important properties;" "Theory of vacuum and gas-filled photoelectric tubes;" "The study of the phenomenon of ionic dissociation in relation to concentration of the solution (copper sulfate solution, for instance)."

In 1955/56 a new curriculum for pedagogical institutes was drawn up by the Ministry of Higher Education of USSR on the basis of directives of the SOVNARKOM in connection with the "overburdening" qualities of the old plan, the multitude of subjects, and repetitiousness.

According to the new curriculum plan, the weekly study requirement is 32-36 hours (6 days a week) of compulsory required classes of a theoretical and practical nature within the Institute buildings (the old plan often reached 40-44 hours a week). Elective courses are taken outside of the 32-36 hours. (see Vestnik Vysshey Shkoly, No. 2, p. 15). After graduation and the passing of final examinations in all subjects, the students must, before they can be employed, pass a special government examination, instituted in 1937. (see "Vysshaya Shkola" - Osnovnyye postanovleniya, prikazy i instruktsii, Moscow, 1948, p. 150-152). The head and members of the special commission giving these examinations are, for

each Institute, approved by the Ministry of Higher Education of the USSR, Members of these commissions are, various department heads of the Institute, the professors of the most advanced fields in each subject, and one-two outside specialists not on the staff of the given Institute. The work of these commissions is done from June 1 to June 30 and from September 1 to September 30. Which subjects the student must be examined in at these examinations, is determined with respect to which specialty the student wishes to teach, by the Ministry of Higher Education of the USSR. The tests are both written and oral. Students who had A's and B's in all required subjects, and got A's in all subjects of the special postgraduate examination, receive a "diploma with excellence." The Bachelor's and Master's degrees do not exist in these as well as all other Soviet schools.

Due to the greater curriculum, a 6-day work week, and the two months longer school year (September 1 to July 1), the time spent for studies is considerably greater than that spent in attaining the Bachelor's and Master's degrees in the USA. Also, since in the larger cities - as Moscow, Leningrad, Kiev, Kharkiv and other cities with Universities - the quality of teaching staffs available to teach in the pedagogical institutes is quite high, the quality of secondary school teachers profuced by them is undoubtedly high.

One must note, however, that these comments apply to the better regular pedagogical institutes, not evening or correspondence sections of such institutes, the number of students in

which equals, and even surpasses that in the regular institutes, and which can only give a "secondhand" type of education that cannot be compared to that in the regular pedagogical institutes. In addition to that, as was mentioned before, many teachers in secondary schools have no higher education of any kind. Thus, in the official publication of the Ministry of Higher Education, (Narodnoye Obrazovaniye, No. 8, 1954, p. 28) states:

"Among 1676 teachers in grades 8-10, 428 teachers do not have a higher education [in Kursk oblast']." This means that 25% of the teachers of Kursk oblast' do not have a higher education. And Kursk oblast', being centrally located, is by no means an exception, a similar situation existing all over the Soviet Union. These teachers without higher education teach predominantly in rural areas and small towns. A situation like this, with a great number of teachers teaching higher grades of high school, being themselves only high school graduates, is certainly unique, and the Soviet propaganda of their school system being the best in the world, with the best-trained teachers, is altogether false. Due to the great percentage of such teachers, the Soviet Union shall have to use them for a long time, especially if one takes into account that it plans to establish universal compulsory secondary education throughout the Union, and has a great shortage of teachers. The existence of such teachers is the reason for the great number of students enrolled in 41 evening sections and 189 evening sections of pedagogical institutes, and also the 4 correspondence institutes

with many departments. This wholesale preparation of teachers by correspondence schools is also a phenomenon unique with the Soviet Union. That correspondence-school education is of inferior quality is obvious.

The "Economy of the USSR" - Collection of Statistics (1956), does not give any figures on the numbers of students attending regular pedagogical institutes in 1955/56, but they can be approximately calculated from other data. As was noted earlier, the number of students attending 123 pedagogical institutes in 1946/47 was 79,000. According to the fifth- five-year plan (1950-55) the admission of students into pedagogical institutes was planned to be increased by 45%. If this was accomplished, then in 1955/56 there should be in the 123 regular pedagogical institutes 115,000 students, and in all 218 pedagogical institutes in 1955/56 there should be approximately 220-240,000 regular (attending) students. In addition to this there are about 10,000 students in the 41 evening sections, who are mostly secondary school teachers during the day.

According to data given by Vestnik Vysshey Shkoly No. 1, 1953, p. 19: "In pedagogical and teachers' instititues there is at the present time more than 300,000 correspondence students." "Economy of USSR - Statistical Collection" Moscow, 1956, p. 194, shows that the total number of teachers, library and cultural workers with higher and secondary education is in USSR 1,725,000. In previous discussion of the elementary school we noted that the number of teachers in elementary school was about 700,000.

From this it follows that the number of teachers in USSR secondary schools is about 900,000, not including library and cultural workers. If one assumes that the number of correspondence students in pedagogical institutes is now the same as in 1953 (300,000), then the conclusion is that the number of teachers teaching in the upper grades of the 10-year school who do not have higher education is 37% of the total number of teachers of the upper grades of 10-year schools, because correspondence school students are in overwhelming majority teachers of the upper grades of secondary school who have not yet completed secondary education but are required by law to do so.

The total number of students in pedagogical institutes of USSR - regular and correspondence, is at the present time about 520-540 thousand (220-240 thousand regular and 300 thousand correspondence). The total number of students in higher educational institutions in USSR including both regular and correspondence, is according to the "Economy of USSR - Statistical Collection 1956" p. 227, was in 1955/56 1,867,000 (1,228,000 regular students). From this it follows that the total number of students of regular and correspondence pedagogical institutes in USSR is about 30% of the total; the number of regular students being about 20% of the total number of regular students of all higher educational institutions in USSR.

As seen from the above mentioned table the number of subjects for which a Pedagogical Institute prepares teachers, varies from one to eleven. The largest are found in Moscow and Leningrad:

1) Moscow Oblast' Pedagogical Institute,

Moscow, ul. Radio, 10a

Specialties: Russian language and literature; history; mathematics; physics; natural sciences and chemistry; geography; English language; German language; French language; physical culture

Correspondence department: the same specialties

2) Moscow City Pedagogical Institute im. V. P. Potemkin

Moscow, Davydovskiy per., 4

Specialties: Russian language and literature; history; mathematics; physics; geography; natural sciences and chemistry; drafting and drawing; English language; German language; French language.

Correspondence department: the same specialties except physics

3) Moscow State Pedagogical Institute im. V. I. Lenin

Moscow, M. Pirogovskaya ul., 1

Specialties: Russian language and literature; history; mathematics; physics; natural sciences and chemistry; geography; pedagogy and psychology; defectology; English language; German language; French language.

4) Leningrad Pedagogical Institute im. A. I. Gertsen

Leningrad, Naberezhnaya Moyki, 48

Specialties: Russian language and literature; history; mathematics; physics; natural sciences and chemistry; geography; pedagogy and psychology; defectology; English language; physical culture.

Department of peoples of the Far East.

Correspondence department: the same specialties except English language, pedagogy and psychology, and department of peoples of the Far East.

Evening department: Russian language and literature; mathematics; history; natural sciences and chemistry; geography.

5) Leningrad pedagogical institute

Leningrad, Malaya Posadskaya ul., 26

Specialties: Russian language and literature; history; mathematics; physics; natural sciences and chemistry; geography; English language; German language; French language.

Correspondence department: Russian language and literature; history; mathematics; geography; natural sciences and chemistry.

The smallest pedagogical institutes are the following:

1) Osipenko pedagogical Institute im. P. D. Osipenko

Osipenko Ukrainian SSR, ul. Dyumina, 15

Specialty: mathematics

Correspondence department: same specialty

2) Slavyansk Pedagogical Institute

Slavyansk Stalinskoy obl., ul. Shevchenko, 15

Specialty: mathematics.

Correspondence department: same specialty

3) Chernigov Pedagogical Institute

Chernigov Ukrainian SSR, ul. Lassalya, 1

Specialty: mathematics

Correspondence department: same specialty

4) Azerbaydzhan Pedagogical Institute of Russian language and Literature im. Mirzy Fatali Akhundova

Baku, ul Polukhina, 205

Specialty: Russian language and literature

Professors and Instructors of Pedagogical Institutes in USSR

According to the statistical data published in the official periodical of the Ministry of Higher Education of USSR (Vestnik Vysshey Shkoly, No. 1, 1955, pp. 4-6) there is a total of 10,000 professors, instructors, etc., in pedagogical institutes of R.S.F.S.R.. If this is true, then the total number of instructors of all levels in pedagogical institutes of the USSR is about 18- 20,000, as the number of pedagogical institutes is approximately half of the total number of them in USSR. (see "Spravochnik dlya postupayushchikh v vysshyye uchebniye zavedeniya v SSSR v 1956" - Handbook For Enrolling in Institutions of Higher Education in USSR in 1956.)

The above mentioned official periodical (Vestnik Vysshey Shkoly No. 1, 1955, pp. 1-12) states on page 5 that in pedagogical institutes of R.S.F.S.R. there are 3,500 teachers holding the degree of Candidate of Sciences (the term "science" is used as translation of the Russian "nauka," which includes all fields of knowledge, e.g. the humanities, not only the "sciences" in the American sense), a degree which, as shall be

explained later, is equivalent to the Ph. D. degree in the United States, and that in 1953 there were 6,918 instructors of pedagogical institutes who did not hold a degree of any kind, that is university graduates. The sum of the two figures given above is 10,418, not including Professors of the pedagogical institutes. This seems to be a rather free use of statistical figures on the part of the Soviets, as the number of instructors not including full professors who have to hold Doctorate degrees, is 418 more than the total number of instructors of all levels including professors - obviously nonsense.

By Statute of Higher Education - law governing all higher educational institutions, every facultet must be headed by a Professor who is a Doctor of Science. The above periodical states that in R.S.F.S.R. the pedagogical institutes have 1800 departments (chairmanships - kafedra). Since the number of pedagogical institutes in R.S.F.S.R. is about half that of the whole Soviet Union, there must be in the Soviet Union about 3600 facultets of pedagogical institutes. Since every department (kafedra) must be headed by a professor, it follows that by law the minimum number of Professors-Doctors should be 3600, and taking into account that some departments need several Professors - to teach advanced subjects, the number of Professors needed in USSR is much higher than 3600. Actually, however, their number is considerably smaller than even that. Vestnik Vysshey Shkoly No. 9, 1947, p. 31 states that in pedagogical institutes of USSR: "... now are working 475 Professors-Doctors,

2,183 Docents - Candidates of Sciences, and 7,343 instructors and assistants." Since the number of Candidates of Sciences in 1955 was shown above to be 3,500, that is about 1.7 times the number of Candidates in 1947, allowing for an analogous increase in the number of Professor-Doctors should now be about 700. This means that the number of Professor-Doctors in pedagogical institutes is now only 20% of the minimum required by law, or about 4 Professors per institute.

The problem of meeting this shortage in pedagogical institutes is so great that the fulfillment of the required minimum of filling of all positions of facul'tet chairmen by full professors, is a question of the distant future, even though some pedagogical institutes as for instance the ones in Moscow, Leningrad, etc., are doubtless fully staffed with Professors, leaving smaller pedagogical institutes without any, leading to unequal results in the training of teachers by the institutes.

Pedagogical institutes underwent during the Soviet rule a considerable number of drastic changes. In 1921/22 in USSR there were about 80 pedagogical institutes, including pedagogical facul'tets of universities, with 24,816 students. In 1923/24 there was only 47 of them, with 20,641 students, while in 1927 the number fell to 27, with 15,500 students. This decrease was officially explained by that the institutes were founded on insufficient material basis, and could not "assure the needed quality of scientific training." "Therefore, it was necessary to liquidate a series of pedagogical institutes, and

to bring the network of pedagogical institutes into accordance with the financial condition of (the USSR), and the cadres of instructors available." (Vestnik Vysshey Shkoly, No. 11, 1947 pp. 36-41).

The curricula of pedagogical institutes were often changed, and before 1930's they were divided into two categories - industrial and agricultural, with "ultramodern" teaching techniques, and as the same issue of the Vestnik points out: "Here was manifested the influence of "project" methods, trying to transfer the center of gravity of the work from stuffy classrooms to collective farms and industry, organizing the so-called 'production practice' in collective farms and industry." The curriculum of the same period had 30% of it devoted to the academic study and 21% of the time on the so-called "polytechnical cycle." This "polytechnization" of pedagogical institutes stemmed from the goal of "to arm the future teacher with the knowledge of industrial or agricultural production, depending on the specialization of the institute (agricultural pedagogical institutes, and industrial pedagogical institutes)" (Source: ibid.)

After the resolution of TsK VKP(b) on September 5, 1931 on elementary and secondary schools, which "revealed anti-Leninist theory of school mortification (deterioration) and the project method," the pedagogical institutes were more geared to prepare teachers for secondary schools, and in 1934 50% of the total time was devoted to academic preparation of the teacher.

The same resolution liquidated in pedagogical institutes the so-called "laboratory-brigade" method, and the main method of study became again the lecture and individual laboratory work of the students. Previously classroom lectures were forbidden, and "brigades" of the students had to read textbooks, while the professor fulfilled only the role of a consultant to whom questions were directed from time to time. Normal testing had been abolished and the test question was directed to the whole "brigade" which answered it as a group, and was marked on its performance as a group, no individual marking being permitted. This situation existed in all schools, not only the pedagogical institutes.

The above mentioned resolution also abolished the "free curriculum" which allowed each teacher to formulate "projects" according to his wishes. Attendance was herewith also made compulsory, and with stringent checks on attendance. The resolution also abolished the "production practice on collective farms and in industry." (Source: ibid.)

The complete reversion to pre-Soviet methodology and curriculum was made in 1936, which insisted on not academic teaching, but also required original research to be done by the instructors, professors, etc., of pedagogical institutes as part of their duties. Prior to this practically no research work of any kind was conducted in the Soviet Union.

One may not at this point that it took the Soviets 18 years of experimentation leading to complete ruination of the whole school system before they reverted back to the old methods, and the results rose in quality, but have not yet reached pre-revolutionary level.

## UNIVERSITIES IN USSR

Universities in USSR fulfill a double function of preparing scientific workers for research institutions and preparing teachers for secondary schools.

According to the "Handbook for Enrollment in Institutions of Higher Education" (Spravochnik dlya post-upayushchikh v vysshiye uchebnyye zavedeniya) 1956, Moscow, Min. of Higher Ed., 1956, there are in USSR 33 universities as shown in table 15 with the numbers of facul'tets, number of specialties, and date of establishment of each. Fuller information on each of the 33 universities, including names of facul'tets and specialties of each are given in Appendix I.

As is seen from the table 15 shown above, the greatest number of departments (facul'tets) - 12, are at the Leningrad, Moscow, and Kiev universities; the greatest number of specialties are at the Leningrad University - 52 and Moscow University - 37. Twenty one out of 33 universities in USSR have been established after 1917. The most recently established are the Kirgiz University (est. 1951), and Turkmen University (est. 1950). The oldest universities are Vil'nyus University (est. 1579; Soviet - 1940), Moscow University (est. 1755), L'vov University (est. 1758, Soviet - 1944), Kazan' University (est. 1804), Khar'kiv University (est. 1805), Leningrad University (est. 1819), and Kiev University (est. 1834).

TABLE 15

Universities in USSR

| No. | University | Year of establishment | No. of faculties | No. of specialties | No. of specialties in evining section | No. of specialties in correasp. section |
|---|---|---|---|---|---|---|
| 1 | Azarbaydzhan | 1920 | 7 | 15 | 4 | 11 |
| 2 | Belorussian | 1921 | 7 | 13 | - | 9 |
| 3 | Vil'nyus | 1579 | 7 | 17 | - | 11 |
| | Sov. | 1940 | | | | |
| 4 | Voronezh | 1918 | 6 | 13 | - | 7 |
| 5 | Gor'kiy | 1918 | 4 | 7 | - | - |
| 6 | Dnepropetrovsk | 1918 | 4 | 8 | 4 | 3 |
| 7 | Yerevan | 1921 | 7 | 18 | - | 3 |
| 8 | Irkutsk | 1940 | 7 | 13 | - | 6 |
| 9 | Kazan' | 1804 | 7 | 8 | - | 6 |
| 10 | Kazakh | 1934 | 8 | 16 | - | 11 |
| 11 | Karelo-Finnish | 1940 | 4 | 8 | - | 4 |
| 12 | Kiev | 1834 | 12 | 21 | - | 15 |
| 13 | Kirgiz | 1951 | 7 | 13 | - | 7 |
| 14 | Kishnev | 1946 | 5 | 10 | - | - |
| 15 | Latvian | 1919 | 8 | 22 | 4 | 7 |
| | Sov. | 1940 | | | | |
| 16 | Leningrad | 1819 | 12 | 52 | 7 | 12 |
| 17 | L'vov | Sov. 1944 | | | | |
| | | 1758 | 11 | 23 | - | 4 |
| 18 | Molotov | 1916 | 8 | 14 | - | 7 |
| 19 | Moscow | 1755 | 12 | 37 | - | 14 |
| 20 | Odessa | 1865 | 6 | 10 | - | 7 |
| 21 | Rostov | 1917 | 6 | 11 | - | 7 |
| 22 | Saratov | 1909 | 8 | 10 | - | 7 |
| 23 | Middle Asian | 1920 | 9 | 20 | - | 1 |
| 24 | Tadzhik | 1948 | 5 | 11 | - | 4 |
| 25 | Tartu | 1802 | 5 | 17 | - | 7 |
| 26 | Tbilisi | 1918 | 10 | 23 | - | 3 |
| 27 | Tomsk | 1888 | 7 | 17 | - | 7 |
| 28 | Turkmen | 1950 | 6 | 13 | 5 | 9 |
| 29 | Uzhgorod | 1945 | 5 | 9 | - | 6 |
| 30 | Uzbek | 1933 | 4 | 10 | 5 | 8 |
| 31 | Ural | 1920 | 6 | 11 | 7 | - |
| 32 | Khar'kiv | 1805 | 7 | 13 | - | 5 |
| 33 | Chernovtsy | 1875 | 6 | 10 | - | 6 |
| | Sov. | 1940 | | | | |
| | TOTAL | | 233 | 522 | 36 | 224 |

The total number of departments (facul'tets) is 233; the total number of Kafedras is 1,900. Kafedra is near in meaning to the department in American usage; every Facul'tet has several Kafedras, e.g. the Physics Facul'tet may have a Theoretical Physics Kafedra, a Nuclear Physics Kafedra, Optics Kafedra, etc., each Kafedra being headed by a Chairman. (Source: Vestnik Vysshey Shkoly No 5, 1954, p 48.). Among the facul'tets in all 33 universities are 7 mechanics-mathematics facul'tets, and 7 physics facul'tets.

In 1954/55, there were at the Universities 12,000 full-time professors, assoc. professors (docents), and instructors, 3,000 postgraduate students working for the degree of "Candidate of Sciences", and about 100,000 students (see Vestnik Vysshey Shkoly, No 5, 1954, pp 47-8).

Large universities - Moscow University, Leningrad University, Kiev University, Khar'kiv University, Tbilisi University, etc., especially the first three - take a leading part in the most advanced and vital scientific research of the Soviet Union. They not only prepare highly qualified scientific workers, but carry on research that is often too advanced in scope for the other higher educational institutions. Some of them - Moscow, Leningrad, Kazan', Saratov, etc., have special Scientific Research Institutes. Advanced students can carry on research there under the guidance of accomplished scientists, to fulfill their graduation requirement of a "work presented for the diploma".

One may note here the Moscow University is afforded the greatest care and endowment by the Soviet government. In 1953 a series of new buildings were constructed for it, far more modern and better equipped than those of the other universities. These buildings house the Mechanics-mathematics facul'tet, physics facul'tet, biology-soil science facul'tet, chemistry facul'tet, geology facul'tet, and geography facul'tet. The new buildings house about 1000 scientific laboratories with the best and newest equipment. Humanities facul'tets were left in the old buildings.

The mechanics-mathematics facul'tet has a number of world-famous scientists, as Kolmogorov, Vinogradov, Pontryagin, Alexandrov, Petrovskiy, Gel'fond, Bogolyubov, and others; the other facul'tets employ likewise a large portion of the best Soviet scientific workers.

Moscow University serves not only as a scientific center, but a source of propaganda as well, being constantly shown to innumerable foreign diplomats, scientists and other notables, who are left breathless with the splendor, that the Soviets, despite many hardships and shortages, chose to amass at this one educational center, leaving the others in rather poor economic conditions, a fact which they neglect to mention to their foreign visitors. The visitors, as planned by the Soviets, write upon return to their various homelands of the wonders of Soviet educational conditions in general, thinking that all their educational centers are exactly

like Moscow University. The visitors are likewise fed generous portions of lies about the pay, working conditions, working hours and conditions of the scientists in USSR. Some professors of Moscow University are indeed so privilidged, but as ever the official Soviet publications intended mainly for domestic use indicate, the conditions in other Universities and other higher educational institutions are quite different.

The term of study in Soviet universities is 5 years, during which the student must fulfill requirements of the curriculum corresponding to his intended specialty, write a "work presented for the diploma" (a thesis resembling that required for the Master's degree in USA, but of a much greater scope), and pass special government-conducted examinations. The students in the Universities of USSR are the very best students from all the 10-year school, who are selected on the basis of very stiff competitive examinations. The greatest competition is for enrollment in the Universities of Moscow Leningrad and Kiev.

## Curricula of Soviet Universities

The curricula of Soviet higher educational institutions in effect up to September 1, 1955, were designed to graduate specialists of a "narrow profile," that is highly specialized in a small portion of a technical field. Thus even in 1953/54 there were separate curricula for 460 independent specialties-professions, 135 of which were subdivided further into 510 specialties (see Vestnik Vysshey Shkoly, No. 5, 1955, pp 19-23). Universities prepared students for 62 different "professions" (see Vestnik Vysshey Shkoly, No 5, 1954, p 47), in which for instance the chemistry "profession" was divided into 27 specialties; mathematics was subdivided into 10 specialties (see Ibid., No 4, 1955, p 8). The student had to choose his profession before enrollment, his specialty had to be chosen in about the third year. Every specialty had its own separate curriculum.

In 1954 there was a reconsideration of all curricula of Soviet institutions of higher education, in connection with the government resolution on "improvement in the training of specialists" (see Vestnik Vysshey Shkoly, No 5, 1955, p 19). This resolution expressed the desire of the Ministry of Higher Education to diminish the nomenclature of specialties and widen the scope of specialists to be graduated from the Universities. The nomenclature was diminished from 460 professions to 280, and [redacted] the specialty

classifications diminished by 40% (see Ibid., No 5, 1955, pp 21-23), that is the policy changed drastically from that of narrow specialization to a wider, more general character of scientists.

In connection with this, on Sept 1, 1955, the curricula of the first, second and third year of all facultets of Soviet Universities were changed to produce "wide profile" specialists; in the fourth and fifth year the old curricula were retained temporarily until the graduation of students who were in them at the time of the change, except that in the Physical-mathematical facultets, biology facultets, chemistry facultets and geography facultets, in the 7th semester was included a course in "methodology of teaching" of 36-72 hours, and in the 8th semester was included pedagogical practice of 6 weeks' duration, with a cessation during this period of all other studies.

In the new curricula specialized subjects were deemphasized and subjects of a general character were stressed. Similar specialties were fused into a broader theoretical basis with as little separation as possible and only in advanced studies. This means that in the first two-three years of studies, students of related specialties shall study the same subjects in the same scope. Thus, the 6 specialties of geology were, in the new curriculum given 27 subjects in common, for which 66-68% of the total number of hours of study for the professions shall be devoted, while 32-34% of the time shall to special separate subjects, not counting the time spent

in field work and the "work presented for a diploma."

In physics, only the following 10 specialties were left: theoretical physics; optics; x-ray and metal physics; magnetism; solid state physics; electrophysics; structure of matter; radio physics. Chemistry is left with only the following four specialties out of 27: inorganic chemistry; organic chemistry; analytic chemistry; physical chemistry. The profession of "geology and prospecting of useful mineral deposits" was left with two specialties: geology and prospecting of "magmatogenous" non-ore type useful mineral deposits; geology and prospecting of solid non-ore type useful mineral deposits. The profession of "geophysical methods of search and prospecting of useful mineral deposits" was left with thefollowing three specialties: geophysical methods of prospecting for sites of ore and non-ore type deposits; geophysical methods of prospecting for petroleum, gas, and coal deposits; geophysical methods of study of borings.

In all other new curricula, because of the time devoted to generalized subjects, only from 120 to 370 hours each is left free for the student to take electives and special seminars. These electives and special seminars play an important role in the curricula of universities, in extending and deepening the students' knowledge in some special field, in acquainting them with experimental techniques, methods and nature of scientific resea ch, help the students in fulfilling

the "work presented for a diploma," and also reveals which of the students are more gifted and have an inclination to research.

In the old (before 1955) curricula of Soviet universities, a considerably greater amount of time was devoted to electives and special seminars. Thus in the old geology curricula 626 to 944 hours were devoted to electives and special seminars, while now only 316 to 400 hours ware so devoted; in the old biology curricula, 448-458 hours were devoted to them, while now only 94-370.

Part of the time formerly devoted to electives and siminars in, for instance, biological curricula, is now devoted not only to generalized biological subjects, but also to foreign languages, physics, chemistry, higher mathematics. New subjects are also included which were formerly not given, as for instance biophysics (for all specialties of the biology faoul'tet), ichtyology with basic hydrobiology, comparative animal anatomy, zoogeography (for zoological specialties), plant geography, cytology (for botanists and physiologists). (source: Vestnik Vyasshey Shkoly No 11, 1955, pp 28-33). Some curricula now prepare a student for two related specialties instead of one. Thus the curriculum for the specialties of Slavic languages and literature now include a second specialty each. - Russian language (another manifestation of Russification). Specialties of "classical philology" and "Eastern languages and literature" had now a

second specialty each - either Russian or one of West European languages. A second related specialty was also included in geophysics, geochemistry, some specialties of biology, astronomy, and some others (source: Vestnik Vysshey Shkoly No 7, 1955, pp 1-5). The establishment of double-specialty (or double-profile) curricula was explained by the Ministry of Higher Education that since there was not enough need of specialists of those types and so it is necessary to give the student another profession in order to assure his being usefully placed. (source: Ibid.)

The whole shift to less specialization was explained by the Ministry of Higher Education by "need of various branches of industry, culture and education" in connection with the fact that many students have to be placed in teaching positions, and beginning with 1956 not less than 80% (previously 60%) of graduates of the philological, historical, geographical and biological faculties and not less than 60% (previously 20%) of graduates of physical-mathematical faculties shall be placed yearly in teaching positions of secondary schools, where "wide-profile" specialists are needed (source: Vestnik Vysshey Shkoly No 2, 1955, p 32). It is planned also to abolish and annex to universities the smaller pedagogical institutes in cities where universities exist, where parallel preparation of teachers occurs, as universities graduate teachers of much higher quality. These reforms also include emphasis on pedagogical training of university students and a closer

relationship between secondary schools and the universities. In connection with this, the diplomas of university graduates acquired an additional meaning. Instead of being marked "physicist," "mathematician," etc., the new designations are: "Physicist. Secondary school physics teacher," "Mathematician. Secondary school mathematics teacher," etc. (source: Vestnik Vyssey Shkoly No 11, 1955, p. 32).

Only the future will show the results of such a sharp shift to "wider-profile" education in higher educational institutions of USSR, especially the universities. One must note, however, that similar sharp reforms of curricula in universities and other higher educational institutions of USSR, as well as in other phases of Soviet education, have occured before. Thus in 1920 university curricula were reoriented towards narrower specialization. Also in 1932-36 drastic reforms occured in methodology, behavior regime, curricula, time of study, etc., which resulted in liquidation of "ultra-modern" methodologies and marked a return to a pre-Soviet educational methods, a basic necessity in view of the deterioration of the school system of that time, described earlier in the discussion of secondary educational institutions. Higher educational institutions deteriorated just as markedly under the "modernization" if not more so than the secondary and primary schools. After the Second World War, Soviet higher educational institutions were characterized by a sharp tendency towards, narrow specialization, while in 1955/56

period evidences a basic policy reversal towards more generalized education. It is interesting to note that this latest generalization policy marks another return to pre-Soviet educational view, which emphasized broadwr education, as opposed to very narrow specialization, even though from time to time there were discussions on possible increase in specialization (source: "Organizatsiya Upravleniya Universitetov v SSSR" (Organization of Administration of Universities in USSR) by Prof. Volodymyr Bohun-Chudyniv, Research Program on USSR (Ford Foundation) New York, 1954).

This reform, while undoubtedly leading to the improvement in the training of secondary school teachers, may have the opposite effect on the fulfillment of the other main goal of the universities - the training of scientists for science-research institutions, and so it seems possible that the sharpness of the reversal may lead to some new policy changes in the future.

Work Presented for a Diploma (Diplomnaya Rabota)

As was mentioned earlier, the University student must pass all subjects, write a so-called Diplomnaya Rabota, and then pass a government-conducted series of examinations lasting one month. The Diplomnaya Rabota (Work Presented for a Diploma) was another example of Soviet educational views reinstituted in the 1950's. Diplomnaya rabota is a small independent research work, which embraces a small part of the data which comprises

the specialty of the students. Some universities in USSR, as the Moscow, Kazan', Leningrad, Saratov, etc., have science-research institutes of various specialties. The work of these institutes is theoretical research, and solution of problems arising in industry, etc. The scientific research conducted in these institutes is done by the professors and scientific workers of the facul'tet of kafedra of the given specialty, as well as a number of upper-class students of the facul'tet or kafedra, who under the guidance of their teachers fulfill therein their requirements for the diplomnaya rabota. Thus, Vestnik Vysshey Shkoly No 7, 1954, p 44 indicated that in the Chemistry Research Institute of the Saratov University, upper-classmen yearly conduct 18 to 20 works presented for a diploma. At the Moscow University part of the students likewise fulfill their diplomnaya rabota requirements at three different research institutes (including one specializing in mathematics) of the University, while the greater part of the students of natural science fakul'tets of Moscow University assembles and generalizes material gathered during several years of studies, laboratory work, and field expeditions.

Organization of the work of the mechanical-mathematical facul'tet of the Moscow University, can be seen from information given by P. S. Aleksandrov in Vestnik Vysshey Shkoly No 5, 1956, pp 12-14. According to him, the curriculum of the facul'tet was composed of two groups - compulsory and electives. Compulsory subjects included analytic geometry,

higher algebra, mathematical analysis, differential equations, etc. The differential equations course is taught in the second year by the well-known scientist of a high caliber L. S. Pontryagin, who redesigned this course tying it in closely with problems of technology and natural sciences - regulation theory and oscillation theory for instance. Thus students from the very beginning study material closely connected with the newest scientific developments and their practical significance. Students of the third year attend the course "Analysis III," based in a large measure on material of contemporary mathematical developments.

Elective courses and seminars, of which there is a considerable number are also designed especially with the view of reflecting the newest scientific developments. Their subject matter is constantly being changed, depending on which new problems arise in mathematics and its practical application. Thus at the seminars of Academicians I. G. Petrovskiy, S. L. Sobolev, and Prof. L. S. Pontryagin on differential equations; seminars of Academician A. N. Kolmogorov on the questions of contemporary analysis, and also the theory of probability; Prof. A. G. Kurosh on algebra; and Prof E.M. Gel'fond on functional analysis and mathematical methods of theoretical physics, systematically analize the newest developments in these fields of mathematics. Members of these seminars not only refer to the newest Soviet and foreign mathematical works, but themselves solve many problems.

400 )Professor-Doctors, and 1200 Candidated of Seiences; that is
The same thing occurs also at the other mathematical seminars.
given at Moscow University. Alekdandrov gives the following
example: "At the present time, the French mathematical school
gained important results in the field of topology. It applied
to topology new algebraic methods. Now at out facul'tet several
seminars are in existence, among them some seminars organized
by various kafedra, which are working in this field. The
first works of seminar members bear evidence that our scientists,
including the youth, grasp the modern methods and successfully
apply them." Seminars and electives of the mechanics-mathematics
facul'tet of Moscow University, according to Aleksandrov,
include all the major developments of contemporary mathematical
sciences, including calculating mathematics and computer
machinery mathematics. At Moscow University a calculating
mathematics kafedra (department) with Academician S.L. Sobolev
at the head has been formed. This kafedra conducts work on the
development of calculating machines, and also the solution of
a series of theoretical problems, connected with design of
calculating machines, closely related to such fields as
mathematical logic.

The extent of work done at this facul'tet is, as one
can not emphasize too often, not by anymeans characteristic of
all the universities, but is the best in USSR.

In 1955 at Moscow University there were 2600 scientific
workers, in 210 kafedras (departments) including 89 academicians,
400 )Professor-Doctors, and 1200 Candidated of Seiences; that is

approximately 65% of the scientific pedagogical personnel of the Univeristy hold scientific degrees. (Source: Vestnik Vysshey Shkoly No 5, 1955, p 11))

The educational results of the universities are much higher than those of pedagogical institues for obvious reasons - one year more of study, better teachers and equipment, better prepared students enrolled, etc., and therefore many more students of universities become aspirants (graduate students working for the degree of Candidate of Science), take part in the work of science-research institutes, and make much better secondary school teachers than graduates of pedagogical institutes. A part of university graduates become instructors in higher educational institutions, including pedagogical institutes.

Taking into account the greater amount of time spent for studies than in the USA - 5 years, 6 days a week, 30-34 hours a week, a longer year of study - Sept. 1 to June 30; the better preparation of students in USSR than in the USA (the Soviet universities, being few in number, have a choice of the best of a great number of students wanting to get in); a greater amount of time and attention spent on the diplomnaya rabota (a thesis of a much wider scope than the Master's thesis required in the USA); the results of study and preparation for further scientific study and research are in the better Soviet universities greater than those required for a Master's degree in the USA. The Soviet students of the

better universities are also better prepared to work as aspirants for three years to attain the degree of Candidate of Science - a degree that in the Physical-Mathematical sciences, chemistry, geology, etc. (not in humanities, history, etc.) is equivalent to the American degree of Ph. D. There are no degrees in USSR equivalent to the American Bacheler's and Master's degree. All the graduate of a univeristy gets is a diploma with his specialty indicated on it, the extent of his accomplishments, though is equivalent to the American Master's degree. The better students get a "diploma of the first grade," the average and lower get a "diploma of the second grade."

## Scientific Activities of the Universities

The scientific-pedagogical staffs of Soviet universities, have among them specialists in all main fields of knowledge. Especially in the greater universities there is a considerable number of highly qualified scientists who group around themselves the younger generation of scientists and together with them solve the most difficult problems posed by modern science. Thus, as states Vestnik Vysshey Shkoly, No. 5, 1956, pp. 5-11, physicists of the Tomsk University continue their research in solid state physics, and also actively conduct research in radiophysics. At Chernovets University, under the direction of Prof. Samoilovich research on semiconductors is being done. At Gor'kiy University radiophysics research is being done, and in the same field extensive research is being done also at Saratov University. At the Middle Asian University complex work is being done in the field of alkoid chemistry. At Azerbaydzhan University, Prof. Yu. T. Mamedaliyev, conducts with his collaborators some fruitful research in the field of petroleum chemistry. Groups of geology specialists at L'vov, Kazan', and Irkutsk Universities conduct "important research in their field." In the 1955-1960 five-year plan, some universities plan to organize nuclear physics laboratories equipped with particle accelerators - cyclotrons and betatrons of various power, so that the students working in that specialty could get to work with particle accelerators. In the near

future laboratories are to be organized for cosmic ray research at the Leningrad, Yerevan, Kazakh, and Middle Asian Universities. In these to be soon established laboratories, research in chemistry of artificial isotopes and their application to study of catalytic reaction mechanisms may be broadened. Biophysical laboratories shall likewise be established, where the action of artificial radioactivity on living organisms shall be studied. In the near future the laboratories of Academician V. N. Shapochnikov in Kiev, Prof. B. A. Rubin, Prof. T. N. Godnyev, Prof. V. A. Chesnokov, and other scientists working in the field of photosynthesis shall be enlarged and improved. At Leningrad University Academician Terepinin with his co-workers conducts research on artificial photocatalysis. More than 15 universities are working in the field of semiconductor research.

Interesting work in this field is conducted also by Prof. S. G. Kalashnikov. Groups of university workers take part in the study of the electrical and optical properties of Germanium, Silica, and other semiconductors, methods of synthesis of semiconductor materials, photoconductivity of semiconductors (including processes of transformation of various radiation energies into electric energy), semiconductor detectors of infra-red light, and in working out the basis of quantum-mechanics and phenomenological theory of electronic processes in solids.

These themes characterize major interests of a number of leading scientists in a number of Soviet universities. The above information is, of course not by any means complete, but some conclusions can be formed from it on the intensive scientific work in the most important fields of modern technology done by Soviet universities.

As was shown above, the number of fakul'tets in all the 33 Soviet universities is 263; the number of kafedras is 1,900; the total number pedagogical-scientific workers is 12,000. Vestnik Vysshey Shkoly, No. 5, 1956, pp. 5-11 states that in universities, economic and judicial higher educational institutions in 1955/56 there were 16,000 scientific-pedagogical workers, including 1500 Professor-Doctors (about 10%), and 53% of the scientific-pedagogical workers in them hold scientific degrees. This means that 8480 of the scientific-pedagogical workers hold scientific degrees of Candidate of Science or Doctor of Science. Since the number of Professor-Doctors is 1500, the number of Candidates of Sciences must be 6980. From this one can approximate the number of Professor-Doctors and Docents who work in the universities of USSR. From the ratio of 12,000 to 16,000 it follows that the approximate number of Professor-Doctors in universities of USSR is between 1,100 and 1,300; the number of Candidates of Sciences (Docents) is between 6,300 and 7,000. Taking into account that the number of kafedras (departments) is 1900, and by law each must be headed by a Professor-Doctor, there is

not even the legal minimum of the Professor-Doctors needed to fill positions of department heads, and since many departments need more than one Professor-Doctor to teach advanced subjects, the shortage is quite pronounced, the need being 5,000 to 6,000 Professor-Doctors. The preparation of the scientists required will be a long and arduous task, since the degree of Doctor of Science in USSR is considerably more advanced than the American Ph. D., as will be shown in the following section (h).

The shortage of Professor-Doctors in the Soviet Union may be explained by the following two reasons: 1) Most of the universities [illegible] of 33, were established during Soviet rule without having prepared the Professors necessary. 2) High qualifications are needed for the Doctor of Science, requiring about 7 - 12 years of productive scientific work after the attainment of the Candidate of Sciences degree, and the publication of scientific works that are important contributions to science.

Contributing to the shortage is the fact that Professor-Doctors are not distributed equally. One third of their total number work at Moscow University, for instance, and another one sixth is at Kiev University, which leaves many smaller universities even more badly understaffed.

## Development of Soviet Universities

As soon as the Soviets came into power, they instituted a series of sweeping reforms throughout the educational system. One of them was the establishment on August 2, 1918 of new rules of enrollment into universities, approved by Lenin. These rules announced that all citizens could enroll in universities without showing any diploma from secondary or primary school and without any entrance examinations. The payment of tuition was abolished. As a result of that in Moscow University alone there was in 1921 27,024 students, many of whom never bothered to even attend the university. Very few students were qualified to understand the lectures or work in the laboratories. From 1922 there was established a "class principle" of student selection for universities. This meant that only members of the "proletariat" class and sons of members of the proletariat were eligible. All sons of priests, government workers, and even sons of the kulaks, the well-to-do farmers (who had two cows, a better house, 30-50 acres of land, for instance), were thrown out of the universities. Through this purge the number of students at Moscow University, for instance, was changed from 27,000 to 13,000.

In 1919 in Moscow, and in 1920 in Leningrad and others, so-called "rabfaks" (workers' fakul'tets) were established which were designed to prepare to universities those students from among the proletariat who did not have any

education and consequently could not understand the work being done at the university. On Sept 2, 1921, by signature of Lenin a new set of rules governing the universities was established. This statute changed kafedras (departments) by "subject commissions," composed of equal numbers of teachers and students-communists, something that was, to say the least, completely without precedent. These commissions regulated all phases of university life. The same principle was applied to facul'tets with the formation of "learned soviets" composed half of teachers and half of students. The communist party appointed a rector to head each university, and he became a complete dictator of all university policies, and controlled the votes of the students-communists in the "subject commissions" and "learned soviets" as their party supervisor. The objective of these reforms, as stated by Vestnik Vysshey Shkoly No. 4, 1947, p. 45: "...in one blow to end with the old school." The Soviets were looking for a new structure system for universities, and tried them out in the old universities, as well as the new ones - established at about that time.

Newly established Gor'kiy University, for instance, was given a curious assortment of facul'tets - agronomy, mining, engineering-construction, physico-chemical, professional, encyclopedic, etc..

In Ukraine in the 1920's all universities were closed, and in their place "Institutes of Public Education" were established with facul'tets: social training, professional education, political-enlightening.

In R.S.F.S.R. the universities were retained, and even in 1922/23 Moscow University was extended by establishment of several institutes by it - of mathematics-mechanics institute, physics, zoology, soil science, etc.. At Leningrad University institutes of math.-mechanics, astronomy, chemistry were established. At Tomsk University the "Siberian Physico-Technical Institute" was opened.

Many professors of universities especially of law and historical-philological facul'tets, which were closed, students dismissed and teachers fired.

From 1932 on a sharp reversion to the reestablishment of pre-soviet methods and structure in the universities was effected, in connection with the resolution of TsIK SSSR on curricula and regime in higher educational institutions.

As stated in Vestnik Vysshey Shkoly No. 5,1947, p. 44, this resolution: "...made an end to experimentation and erring policies of the NARKOMPROS with respect to the universities." This resolution devoted a special "point" to the universities, issuing a directive to: "...strengthen the existing universities as educational institutions preparing highly qualified specialists in general scientific fields and also pedagogues, and establish universities in those republics where they do not exist (Ukraine and others)." As the abovementioned article states: "This authoritative resolution put an end to all talk of there being no need for the universities." Now came the time of reestablishment of previously abolished facul'tets. In Leningrad the chemistry facul'tet and biology facul'tet were reopened. At

Moscow University the chemistry facul'tet was reestablished. In Ukraine, the Kiev University, Khar'kiv University, Odessa University, and Dnepropetrovsk University were reestablished. By these universities a series of scientific-research institutes was opened. Odessa University annexed a physical-chemical research institute, an astronomical observatory and a geophysical research station.

In 1937 the humanities facul'tets began to be re-established. Thus at Leningrad University a philology facul'tet was reopened.

The resolutions of the SOVNARKOM in 1934 and 1937, reestablished scientific degrees and titles, which the Soviets had formerly abolished, and the lack of which caused many unqualified persons to be employed by the universities, sharply lowering the teaching standards. Also reinstated was the competitive system of selecting Professors and Docents. In 1937 entrance examinations for students were likewise reestablished.

These changes towards the pre-Soviet educational views, led to a sharp rise in the quality of work done at the universities. New curricula thus oriented, with the increase to 5 years, considerably increased the depth of the students' knowledge. These curricula devoted a great deal of time to special courses and special seminars, and reinstated elective courses. Advanced students were encouraged to work in the scientific-research institutes. The whole system was geared to the production of "narrow-profile" specialists.

The Soviets, having inherited a tradition of excellent universities, with a system of highly qualified scientists in many fields, instead of improving them were at first trying very hard to destroy them. Their reckless and stupid experimentation that lasted 14-16 years, had brought the universities to almost complete ruin, having destroyed the system and ejected from the universities many expert scientists especially in history and other humanities, and in biological sciences. Only the physical-mathematical, chemical and technical sciences were not completely destroyed.

Having realized the extent of the damage they had made, the Soviets made sharp steps to reverse the system and try to undo the damage, and only thanks to the existence of many scientists of the old school and their students were they able to get the universities back on their feet. This process of restoration is continued to this day, but has not yet qualitatively reached pre-Soviet level, just as their present-day 10-year schools had not yet reached the quality of the old system and so on down the line, especially in the knowledge of foreign languages, the knowledge of which had enabled students to draw on foreign sources of scientific development in the West.

Many western observers credit the Soviet Union with a model educational system, forgetting that that system was built up by centuries of hard work to a state in which even 14 years of Soviet effort concentrated on its destruction could not completely destroy it. The only credit to the Soviets is that

they had had the sense to return to the old methods when they saw their education crumbling into dust, and allowed the remnants of the old school of scientists to build it up again. Even now the leaders of Soviet science are not communist-produced, as is testified by the fact that almost none of them are members of the communist party, despite the many personal advantages and privileges that membership in the party offers its members, and despite the pressures put on them to join.

## Scientific Degrees and Titles in Soviet Education

Resolutions of the SOVNARKOM in 1934 and 1937, returned to the fold of Soviet education the old degrees of Magister and Doctor of Sciences, renaming the former "Candidate of Sciences." These resolutions also established the organizations to regulate the giving of degrees. The highest organization for the giving of degrees is the "Vysshaya atestatsionnaya komissiya" (Supreme attestation commission) at the SOVNARKOM SSSR. As states Vestnik Vysshey Shkoly No. 9, 1953, pp. 24-30, the right to accept the Doctorate dissertation is given to 156 higher educational institutions and science-research establishments. The right to accept the Candidate dissertation was given to 278 higher educational institutions and 211 science-research institutes.

Among the 31 universities which existed in 1947, only 21 received the right to accept Doctorate and Candidate dissertation. The awarding of degrees on the basis of defense of dissertation can be done by those institutions, however, only for the degree of Candidate of Sciences, and they can recommend the aspirant for a doctorate after he successfully defended his dissertation to the Supreme Attestation Commission, which then decides whether to award the degree. The Commission also reviews Candidate dissertations and can take away the Candidate degree if it wants to, even after it has been awarded.

The following 7 universities did not get the above rights with respect to the doctorate degrees: Gor'kiy, Irkutsk, Kazakh, Karelo-Finnish, Molotov, Uzbek, Ural; Kishnev, Uzhgorod,

and Chernovtsy Universities did not get any of the above rights. (source: Vysshaya Shkola, L. of C. call no. KR 2280 .A12 1948, pp. 329-330). The Supreme Attestation Commission dividing the universities into three categories, indicated that the above-mentioned universities do not have the necessary standards.

Degrees are awarded in the following fields:

1) physical-mathematical sciences;
2) chemical sciences;
3) biological sciences;
4) geological-mineralogical sciences;
5) technical sciences;
6) agricultural sciences;
7) history;
8) economics;
9) philosophy;
10) geography;
11) judicial;
12) pedagogical sciences;
13) medicine;
14) pharmaceutical sciences;
15) veterinary sciences;
16) arts;
17) architecture.

The degree mentions only the appropriate field from the ones above, without mentioning specialties, e.g. Doctor of Medicine, Candidate of Veterinary Sciences, Doctor of Arts, etc. (source: ibid., pp. 327-8).

Persons holding the degree of Candidate of Sciences, and conducting the corresponding pedagogical and research work at a higher educational institution under the direction of a Professor, are given the title of Docent.

Persons holding the degree of Doctor of Sciences and conducting pedagogical and research work of leading quality in higher educational institutions or science-research establishments are given the title of Professor.

The title of Assistant is given to persons who have graduated from a higher educational institution having sufficient preparation for teaching or research work and conducting such work in a higher educational institution under the direction of a Professor or a Docent (source: ibid).

Statistical information given in "Narodnoye Khozyaystvo SSSR - Statisticheskiy Sbornik" Moscow, 1956, p. 233, indicates that in 1955 of USSR the number of scientific workers was 223,900, among them those having Doctorate Degrees - 9,500, the number having Candidate degrees - 78,000.

The dissertation presented for a Candidate of Science degree must reveal the general theoretical knowledge of the aspirant, his special knowledge in the field of the dissertation, and talent for independent scientific research, which must be expressed in the achievement of a new, original scientific result.

The Doctorate dissertation must be an independent research work, the result of which is the solution or theoretical generalization of scientific problems or a scientifically based presentation of new problems, with considerable scientific

interest. The Doctor of Science is an accomplished scientist who had given significant contributions to science, having made general theoretical conclusions, and having a large number of scientific works published (source: "Vysshaya Shkola," Moscow 1948, p. 326; Vestnik Vysshey Shkoly No. 8, 1955, p. 14).

The General Assembly of the Academy of Sciences of SSSR has the right to award Doctorate degrees "honoris cause" without defense of a dissertation, to especially noted Soviet and foreign scientists. Full members of the Academy of Sciences of SSSR are given doctorates at the moment of their election to membership.

From the day of the resolution of SOVNARKOM SSSR in 1934, on the reestablishment of scientific degrees and titles, to 1947, 5,236 persons received Doctorate degrees 1309 without defending a dissertation, in which during the first six years 886 persons got the Doctorate without having to defend a dissertation, while during the second six years 423 persons received them. The great number of Doctorates given without a dissertation during the first six years is explained by the fact that this degree was in the first place given to those Professors who had already achieved Doctorates before Soviet rule, and whose Doctorates (as all scientific degrees and titles) were at first taken away by the Soviets. Also during the time when there were no degrees many scientists achieved a high status of competence, despite the Soviet experimentations, and in the following years the number of Doctorates given without defending dissertations, was less and less with every year, and the main way of attaining a doctorate is now the dissertation.

From 1937 to 1947 the number of degrees of Candidate of Sciences awarded was 25,957. If the new data in the 1956 statistical collection is to be trusted, then at the present time there are 78,000 Candidate degrees, that is within the period of 8 years about 55,000 (some must have died in this period) that is every year about 8,000 were graduated. The same statistical collection, however, on p. 23 states that in 1950 4,093 aspirants were graduated, not all of whom received

the degree, and in 1955 7,607 were graduated, from which also not all received the degree, so it is evident that the Soviet figure of the total number of Candidates of Science (78,000) is optimistically exaggerated for propaganda purposes, while the actual number is not more than 60,000.

Vestnik Vysshey Shkoly No 9, 1948, pp. 26-30 states that the Supreme Attesting Commission confirmed in the degree of Doctor of Science in 1946 - 484 persons, and in 1947 - 648 persons, in the fields shown in the following table.

| Fields | Total 1946 and 1947 Number | Total 1946 and 1947 % of total | 1946 Number | 1946 % of total | 1947 Number | 1947 % of total |
|---|---|---|---|---|---|---|
| Physical-mathematical | 71 | 6.3 | 38 | 8.0 | 33 | 5.0 |
| Chemical | 60 | 5.3 | 21 | 4.0 | 39 | 6.1 |
| Biological | 113 | 9.9 | 36 | 7.4 | 77 | 11.9 |
| Geology-mineralogy | 81 | 7.3 | 33 | 6.9 | 48 | 7.4 |
| Technical | 239 | 21.3 | 98 | 20.3 | 151 | 23.3 |
| Agricultural | 48 | 4.4 | 20 | 4.0 | 28 | 4.3 |
| History | 37 | 3.4 | 17 | 3.5 | 20 | 3.0 |
| Economics | 19 | 1.8 | 10 | 2.2 | 9 | 1.4 |
| Philosophy | 6 | .5 | 4 | .9 | 2 | .3 |
| Philology | 42 | 3.8 | 15 | 3.2 | 27 | 4.2 |
| Geography | 14 | 1.2 | 3 | .6 | 11 | 1.7 |
| Law | 23 | 2.1 | 12 | 2.7 | 11 | 1.7 |
| Medicine | 302 | 26.8 | 151 | 31.2 | 151 | 23.3 |
| Pharmaceutical | 2 | .2 | 1 | .2 | 1 | .2 |
| Pedagogical | 9 | .8 | 4 | .8 | 5 | .8 |
| Veterinary | 29 | 2.7 | 13 | 2.6 | 16 | 2.5 |
| Art | 19 | 1.7 | 8 | 1.8 | 11 | 1.7 |
| Architecture | 5 | .4 | — | | 5 | .8 |
| Military | 1 | .1 | — | | 1 | .2 |
| Military-naval | 1 | .1 | — | | 1 | .2 |
| Total | 1132 | 100 | 484 | 100 | 648 | 100 |

From this table it follows that the number of persons having received doctorates in physical-mathematical, chemical, biological, geological-mineralogical and technical fields in 1946 was 46.6% of the total number of persons who received doctorates during this year, and 50% of the total in 1947. In one assumes that such a relationship between the group of specialties indicated and the total, then the number of persons in USSR holding doctorate degrees in these fields is now about 4,300 to 4,600, that is about a half of the total number of Doctorates in USSR (9,500).

Aspirantura.

According to the rule approved by SOVNARKOM SSSR on March 31, 1939 (see "Vysshaya Shkola, Moscow, 1948, p. 299, 232), the main method of preparation of Professor-pedagogical scientific cadres is the process called "aspirantura." An aspirant (person undergoing aspirantura) is a graduate student working for the degree of Candidate of Sciences, or a Candidate of Sciences working for the degree of Doctor of Science, in which case it is called doktorantura. Aspirantura is, by law, in effect only at such higher educational institutions and science-research institutes which are staffed with highly qualified scientific "leaders" and has the corresponding scientific research facilities. Aspirant contingents and also the institutions and kafedras in which preparation of professor-pedagogical cadres by way of aspirantura can take place are confirmed by the All-Union Committee of Higher Education at the recommendation of the appropriate "narkomat." All Candidate degree aspirant contingents must pass examinations

in Marxism-Leninism, their specialties and one foreign language. The aspirant works for a certain definite kafedra under the direction of an advisor who bears responsibility for the results of the aspirant's work. The advisor formulates an individualized curriculum for the aspirant, which is a three-year program. The aspirant is to fulfill works related to his dissertation theme, systematically study sources in foreign and Russian literature in his specialty, study and attend classes in related subjects, and perfect his knowledge of foreign languages. The language in which the aspirant took his entrance exam is studied in the first year, the second language in which he must be proficient before defending his dissertation is studied in the 2nd year. Aspirants have full use from the first year of aspirantura of all facilities of laboratories, special libraries and the library of the Academy of Science, on equal basis with regular research workers in the institutes. The aspirant must take an examination at the end of each year in his specialty and foreign language, within the scope of his individual curriculum. At the end of the term indicated by his individual curriculum the aspirant must defend his dissertation for the degree of Candidate of Science.

The aspirant must be dismissed from aspirantura if:

a) such is recommended by his advisor on motives of demonstrated inadequacy in scientific research work;

b) he fails examinations in his specialty and foreign language;

c) he does not submit on time his dissertation work.

All accepted aspirants get government stipends during aspirantura. They also get an allowance for the acquisition of scientific literature. The amount of this allowance is equal to the stipend itself. The aspirant is also allowed to supplement his income by teaching in a higher educational institution, but no more than 30 hours a month. The aspirant gets 12 days vacation in the Winter and 2 months in the Summer.

Doktoranturs.

To doktoranturs are accepted persons not older than 45, or in exceptional cases 50 years of age, holding the degree of Candidate of Sciences, knowing two foreign languages (a third is studied during doktoranturs), and having recommended themselves as competent scientific research workers. Acceptance to doktoranturs is by competition on the basis of judgement of the caliber of scientific works published by the applicant, and an examination in the knowledge of two foreign languages. The doktorant enjoys the same privileges in using facilities of the institution he works in. Doktoranturs is conducted by the Academy of Sciences of USSR, and also in some large universities, where facilities for advanced research are available. Responsibility for the work of the doktorant is assumed by his appointed advisor or two advisors.

The term of study is determined for each doktorant individually, depending on the level of his knowledge and the nature of the dissertation work to be presented, but comprises of more than four years of work, including the defense of the dissertation, without taking the doktorant away from his main work. Recently a system was devised for the doktorant to finish doktoranturs in two years, being granted a leave of absence with full pay from the institution of his main work.

The theme of the dissertation is included in the regular schedule of the research plan of the institute where the dissertation is fulfilled, among all the regular non-degree research being done by the institute.

The doktorants finishing their doktorantura must be proficient enough in three foreign languages to fully utilize all scientific literature in those languages in their field. Doktorants who have defended the dissertation for the Doctor of Science degree are considered as having finished their doktorantura.

According to information found in Vestnik Vysshey Shkoly No.4, 1955, p. in Soviet universities, economic vuzes and judicial institutes, in the period of 1947-1955 inclusive, 6757 persons finished aspirantura, only 1925 (28.5%) of which defended the dissertation on time. A similar situation of late presentation exists also in doktorantura. This is explained in Vestnik Vysshey Shkoly No.8, 1955, pp 12-15 by Correspondent Member of the Academy of Sciences of USSR, V.N. Kuznitsov (from Tomsk University), by the fact that the theoretical preparation of aspirants is usually composed of four subjects, one of them in a foreign language, one in philosophy, and two in their specialty, all of which he must pass during one and a half years, in which the first two subjects take up half the time. Kuznitsov feels that the one and a half years left, are insufficient for the preparation of a dissertation for Candidate of Sciences degree.

In the same Vestnik, Kuznitsov notes that a considerable number of Candidate dissertations are not of any scientific value. This he explains by the fact that the responsibility for the aspirant's finishing his work on time is put with his advisor. Such a system assumes that each aspirant must become

a scientific worker, and if he does not become such, his advisor is blamed. He is blamed for choosing the wrong theme for the dissertation of the aspirant. And thus advisors are apt to try put themselves out of blame's way by taking appropriate measures, choosing a theme which is not a search of something new, yet will be satisfactory for a dissertation. "This is why there are yet so few Candidate dissertations that contribute to science in any real way. In most cases they are developments of subjects already known".

Vestnik Vyesshey Shkoly No.1, 1955, p.10, gives some examples of strange themes in pedagogical sciences for which Soviet aspirants received Candidate degrees: "It sometimes is also this way. A teacher writes on the theme 'Role and Significance of the School Bulletin Board (stennaya gazeta) in the Work of Communist Upbringing of 7th Grade Public School Students.' And lo, he was awarded a degree of Candidate of Science. Or take the dissertation for Candidate of Pedagogical Sciences, 'Jumping Over the Gym Horse by the "Legs Spread" method.' Now where is pedagogy here!?!"

From these remarks it of course does not follow that there are no Candidate dissertations that have definite scientific value. Doubtless aspirants who undergo aspirantura at the large universities and institutes of the Academy of Science of USSR, in the fields of physics, mathematics, biology, technology, and others have presented dissertations of evident worth. This is indicated in part in Mathematical Reviews (American publication),

where are reviewed some positive Soviet works, among Candidate degree dissertations. Many of these works equal in scope American Ph. D. dissertations. One must, however note that these dissertations do not equal in scope the dissertations for a Magister degree which existed before Soviets came into power. This is so because the Magister aspirant was studying as a rule in a better universities than the present Soviet ones, even though they were few in number (9), and consequently the students and therefore aspirants were better prepared in approaching their Magister dissertation, and it was of a higher level. Prof. Kuznitsov corroborates this in the already mentioned article in Vestnik Vyssahey Shkoly: "To defend the former Magister dissertation in pre-revolutionary Russia was harder than the present Candidate dissertation, but easier than contemporary Doctorate."

The Magister applicant knew at least three languages - French, German, Latin, and some four languages, adding Greek to the other three. Therefore he did not have to study a new language during his preparation period for the Magister degree, and also did not have to pass examinations in Marxism-Leninism or any correspondent ideological equivalent of the Tsarist system. He had instead to pass 7 subjects all pertaining to his profession before he was allowed to defend the dissertation, one of which was a written examination on a theme not revealed to him until the examination. So the Magistrate degree had a greater significance than the present-day Soviet equivalent of Candidate of Sciences. Also his knowledge of the foreign languages was very

much greater than the present-day knowledge of the Candidate of Sciences. This can be seen from the fact that the Candidate aspirant has to pass one language and then study another for only one year, and the entrance examination in foreign language required before graduation of pre-Soviet secondary schools. In the present 10-year schools, however, only one language is taught, and that on a comparatively low level with respect to the former depth with which the language was treated. The confirmation of this comes from the following fact given by the Vestnik Vysshey Shkoly No.5, 1955, p.47. At the Moscow Institute of Non-Ferrous Metals and Gold where entrance examinations in foreign languages are given, 60% of all (freshmen) must start the continuation of their secondary school language courses beginning with the alphabet. At the graduation from the pre-Soviet gymnazium, however, the student could freely speak at least two foreign languages, almost with the same proficiency as the present-day secondary school graduates of Norway and Denmark. The knowledge of foreign languages is, though, essential for all scientific workers who wish to attain any depth in their researches, and have to follow foreign literature.

As states Vestnik Vysshey Shkoly No. 8, 1955, pp. 12-15 (article by V. N. Kuznitsov), a considerable part of Doctors of Sciences got their doctorate by a dissertation at the end of a doktorantura. Notwithstanding the measures taken, however, the ranks of the Doctors of Sciences in educational institutions under the Ministry of Higher Education are filled lately at a very slow rate. "The system of preparatinn of Doctors (of Sciences) is, in our opinion, contrary to the very notion of Doctors of Sciences. A Doctor of Science is an accomplished scientists in his field, having had a considerable number of works (published) and co-workers working under his direction. It follows that at Doctor of Science not only need no advisors, but himself is able to guide a group of scientists. Doctorantura, however, does not differ in principle from aspirantura. In both cases the theme is given by the advisor and the applicants work under the guidance of the advisors, the only difference being that the theme of the doctorant is more complex and broader (in scope) than that of the aspirant."

In the pre-revolutionary Russian universities, the Magister prepared his Doctorate dissertation working at the university as "extraordinary" professor (lower in rank than "ordinary", which was the highest), chose himself the theme of the dissertation, had no official advisors, and after finishing it sent it to the official reviewers (retsenzent). If they found it satisfactory he was given the right to defend it at the university. After being granted the Doctorate he received the right to be an "ordinary" professor, and to the one and a half

times the pay of the "extraordinary" professor that went with it. At no time was the applicant forced or hurried in any way. Being unhampered by any time schedule he could work at his leasure and submit his work only after he was absolutely positive of its results.

The contemporary Soviet dissertation, is, as Prof. Kuznitsov mentions above, higher in level than the Magistrate dissertation, but lower than the pre-revolutionary Doctorate, and the time is still distant when the Candidate dissertations shall reach the scope of the Magistrate dissertations, and the Soviet Doctorates shall reach the scope of the pre-revolutionary Doctorate. It shall not happen until the 10-year school reaches in quality the teaching of pre-revolutionary gymnasium, the university reaches the quality of the old university, the system of preparation of Candidates will be analogous to former Magister applicants, and the preparation of Doctors be analogous to the preparation of pre-revolutionary Doctors, which, in the opinion of the author of this report is impossible, until the Communist system exists no more.

The present Candidate of Sciences, is, however, as was noted previously, in physics, mathematics, chemistry, biology, technology etc., equivalent to the American Ph. D. degree, while the Soviet Doctorate is considerably higher, and in this lies a considerable advantage of the Soviet system as opposed to the American system. This fact of the superiority of Soviet Doctorates, is not only the opinion of this author, but is recognized by many responsible scientists. A notable example is Dr. Richard M. Borzoth of the Bell Telephone laboratories,

quoted in this by Harrison E. Salisbury in the article on Dr. Kapitsa on p. 3 col. 2, of the Wednesday, July 11, 1956, issue of the New York Times.

At this time, while the Communist Party in Russia is trying all possible means to gain domination of the whole world, and the U.S.A. is forced to defend itself and lead the defense of the free world, and while the USA has now the full advantage over the USSR in agriculture, industry, transportation, and free initiative of its people, the level of science is of the utmost importance. America is fully able at the present time to effect the needed changes to improve its educational system, and is potentially able to maintain the finest educational system in the world, far surpassing that of the Soviets. If these changes are not effected, however, we may be led to an eventual Soviet scientific supremacy, which would be disastrous for the free world.

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# A P P E N D I X I

Universities in USSR: names, addresses, dates of establishment, faculties, specialties of faculties.

# Universities in USSR

Following are the 33 Soviet universities with their addresses, dates of establishment and facul'tets:

1) Azerbaydzhan State University im. S. M. Kirov
Baku, Kommunisticheskaya ul., 6; established in 1920

A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Azerbaydzhan language and literature; Russian language and literature; library science and bibliography; journalism; Iranian languages and literature.

C) Law facul'tet.
Specialty: jurisprudence.

D) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

E) Chemistry facul'tet.
Specialty: chemistry.

F) Biology facul'tet.
Specialties: botany zoology.

G) Geology-geography facul'tet.
Specialties: geological survey and search for useful mineral deposits; physical geography; economic geography.

H) Correspondence section.
Specialties: mathematics; history; Russian language and literature; Azerbaydzhan language and literature; journalism; jurisprudence; botany; zoology; physical geography; library science and bibliography.

2) Belorussian State University im. V. I. Lenin
Minsk, Universitetskiy gorodok; established 1921

A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Belorussian language and literature; Russian language and literature; journalism.

C) Law facul'tet.
Specialty: jurisprudence

D) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

E) Chemistry facul'tet.
Specialty: chemistry.

F) Biology facul'tet.
Specialties: botany; zoology.

G) Geology-geography facul'tet.
Specialties: geology and search for sites of useful mineral deposits; physical geography; economic geography.

H) Correspondence section.
Specialties: history; Belorussian language and literature; Russian language and literature; journalism; jurisprudence; mathematics; physical geography; economic geography; botany; zoology.

3) Vil'nyus State University im. V. Kapsukas
Vil'nyus, Universitetskaya ul., 3; established 1579, Soviet est. 1940.

A) History-philology facul'tet.
Specialties: Lithuanian language and literature; Russian language and literature; library science and bibliography; journalism; history; English language and literature; German language and literature; French language and literature.

B) Economics facul'tet.
Specialty: finances and credit.

C) Law facul'tet.
Specialty: jurisprudence.

D) Physical-mathematical facul'tet.
Specialties: physics; mathematics.

E) Chemistry facul'tet.
Specialty: chemistry.

F) Facul'tet of natural sciences.
Specialties: physical geography; botany; zoology.

G) Facul'tet of medicine.
Specialty: the healing arts.

H) Correspondence section.
Specialties: Lithuanian language and literature; Russian language and literature; library science and bibliography; history; jurisprudence; journalism; mathematics; finances and credit; accounting; English language and literature; German literature and language.

4) Voronezh State University
Voronezh, prospekt Revolutsii, 24; established 1918.
A) History-philology facul'tet.
Specialties: history; Russian language and literature.

B) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

C) Chemistry facul'tet.
Specialty: chemistry.

D) Biology-soil science facul'tet.
Specialties: botany, zoology; soil science and agrochemistry.

E) Geology facul'tet.
Specialties: geology and search for sites of useful mineral deposits; hydrogeology and engineering geology.

F) Geography facul'tet.
Specialties: land hydrology; physical geography; economic geography.

G) Correspondence section.
Specialties: Russian language and literature; history; mathematics; botany; zoology; physical geography; economic geography.

5) Gor'kiy State University im. N. I. Lobachevskiy
Gor'kiy, ul. Sverdlova, 37; established 1918
A) History-philology facul'tet.
Specialties: history; Russian language and literature.

B) Physical-mathematical facul'tet.
Specialties: mathematics; physics; mechanics.

C) Chemistry facul'tet.
Specialty: chemistry.

D) Biology facul'tet.
Specialties: botany; zoology.

6) Dnepropetrovsk State University im. 300th Anniversary of Union of Ukraine with Russia.
Dnepropetrovsk, Shevchenkovskaya ul., 59; established 1918.
A) Philology facul'tet.
Specialties: Ukrainian language and literature; Russian language and literature.

B) Physical-mathematical facul'tet.
Specialties: mathematics; physics; mechanics.

C) Chemistry facul'tet.
Specialty: chemistry.

D) Biology facul'tet.
Specialties: botany; zoology.

E) Evening section.
Specialties: Russian language and literature; mathematics; botany; zoology.

F) Correspondence section.
Specialties: Ukrainian language and literature; Russian language and literature; mathematics.

7) Yerevan State University im. V. M. Molotov
Yerevan, ul. Abovyana, 104; established 1921.
A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Armenian language and literature; Russian language and literature; English language and literature; Iranian languages and literature; German language and literature; French language and literature.

C) Economics facul'tet.
Specialties: planning of national economy; accounting; jurisprudence.

D) Physical-mathematical facul'tet.
Specialties: mathematics; physics; mechanics.

E) Chemistry facul'tet.
Specialty: chemistry.

F) Biology facul'tet.
Specialties: botany; zoology.

G) Geography facul'tet.
Specialties: physical geography; economic geography.

H) Correspondence section.
Specialties: finances and credit; planning of national economy; accounting.

8) Irkutsk State University im. A. A. Zhdanov
Irkutsk, Vuzovskaya naberezhnaya, 20; established 1918
A) History - philology facul'tet.
Specialties: history; Russian language and literature; Buryat-Mongolian language and literature.

B) Law facul'tet.
Specialty: jurisprudence.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

D) Chemistry facul'tet.
Specialty: chemistry.

E) Biology-soil science facul'tet.
Specialties: botany; zoology.

F) Geology facul'tet.
Specialties: geology and prospecting for sites of petroleum and gas deposits; geological survey and search for sites of useful mineral deposits

G) Geography facul'tet.
Specialties: physical geography; economic geography.

H) Correspondence section.
Specialties: Russian language and literature; history mathematics; physical geography; economic geography; botany; zoology.

5) Kazan' State University im. V. I. Ul'yanov (Lenin)
Kazan', ul. Chernyshevskogo, 18; established 1804

A) History-philology facul'tet.
Specialties: history; Russian language and literature; Tatar language and literature.

B) Law facul'tet.
Specialty: jurisprudence.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics; mechanics; astronomogeodesy.

D) Chemistry facul'tet.
Specialty: chemistry.

E) Biology-soil science facul'tet.
Specialties: botany; zoology.

F) Geology facul'tet.
Specialties: geological survey and search for sites of useful mineral deposits; geophysical methods of searches and prospecting of sites of useful mineral deposits; geology and prospecting of sites of petroleum and gas deposits.

G) Geography facul'tet.
Specialties: physical geography; economic geography; meteorology.

H) Correspondence section.
Specialties: Russian language and literature; Tartar language and literature; history; mathematics; botany; zoology.

10) Kazakh State University im. S. M. Kirov
Alma-Ata, Sovetskaya ul., 26; established 1934

A) History faculty.
Specialty: history.

B) Philology faculty.
Specialties: Kazakh language and literature; Russian language and literature; journalism.

C) Law faculty.
Specialty: jurisprudence.

D) Economics faculty.
Specialties: industrial economics; trade economics; finances and credit; accounting.

E) Physical-mathematical faculty.
Specialties: mathematics; physics.

F) Chemistry faculty.
Special: chemistry.

G) Biology-soil science faculty.
Specialties: botany; zoology.

H) Geography faculty.
Specialties: physical geography; economic geography.

I) Correspondence section.
Specialties: Kazakh language and literature; Russian language and literature; history; mathematics; journalism; botany; zoology; juris-prudence; trade economics; finances and credit; physical geography.

11) Karelo-Finnish State University
Petrozavodsk, prospect Lenina, 85; established 1940.

A) History-philology faculty.
Specialties: history; Russian language and literature; "Finno-ugorskiye" languages and literature.

B) Physical-mathematical faculty.
Specialties: mathematics; physics.

C) Forestry engineering faculty.
Specialty: forestry engineering.

D) Agricultural facul'tet.
Specialties: agronomy, zootechnics.

E) Correspondence section.
Specialties: mathematics; history; Russian language and literature; "Finno-ugorskiye" languages and literature.

12) Kiev State University im. T. G. Shevchenko
Kiev, Vladimirskaya ul., 59; established 1834.

A) History facul'tet.
Specialty: history.

B) Economics facul'tet.
Specialty: political economics.

C) Philosophy facul'tet.
Specialties: philosophy, psychology.

D) Philology facul'tet.
Specialties: Ukrainian language and literature; Russian language and literature; English language and literature; French language and literature.

E) Journalism facul'tet.
Specialty: journalism.

F) Law facul'tet.
Specialty: jurisprudence.

G) Mechanics-mathematics facul'tet.
Specialties: mathematics; mechanics.

H) Physics facul'tet.
Specialty: physics.

I) Chemistry facul'tet.
Specialty: chemistry.

J) Biology-soil science facul'tet.
Specialties: botany; zoology.

K) Geology facul'tet.
Specialties: geological survey and search or sites of useful mineral deposits; hydrology and engineering geology; geophysics.

L) Geography facul'tet.
Specialties: physical geography; economic geography.

M) Correspondence section.
Specialties: mathematics; physics; physical geography economic geography; history; Russian language and literature; Ukrainian language and literature; English language and literature; French

language and literature; philosophy; political economics; botany; zoology; journalism; jurisprudence.

13) Kirgiz State University.
Frunze, Zapadnaya ul., 72; established 1951
A) History faculty.
Specialty: history.

B) Philology faculty.
Specialties: Kirgiz language and literature; Russian language and literature.

C) Foreign language faculty
Specialties: English language; German language.

D) Economics-law faculty.
Specialties: industrial economics; agricultural economics; jurisprudence.

E) Physical-mathematical faculty.
Specialties: botany; zoology.

F) Geography faculty
Specialties: physical geography; economic geography.

G) Biology-soil science faculty.
Specialties: botany; zoology.

H) Correspondence section.
Specialties: Russian language and literature; jurisprudence; mathematics; botany; zoology; industrial economics; agricultural economics.

14) Kishnev State University.
Kishnev, ul. Pirogova, 65; established 1946.
A) History-philology faculty.
Specialties: history; Moldavian language and literature; Russian language and literature.

B) Economics faculty.
Specialty: finances and credit.

C) Physical-mathematical faculty.
Specialties: mathematics; physics.

D) Chemistry faculty.
Specialty: chemistry.

E) Biology-soil science faculty.
Specialties: botany; zoology; soil science and agronomy.

15) Latvian State University
Riga, bul'var Raynisa, 19; established 1919; Soviet est. 1940.

A) History-philology facul'tet.
Specialties: history; Latvian language and literature; Russian language and literature.

B) Economics facul'tet.
Specialties: industrial economics; finances and credit; agricultural economics; jurisprudence.

C) Physical-mathematical facul'tet.
Specialties: physics; mathematics.

D) Chemistry facul'tet.
Specialties: chemistry; silicate technology.

E) Biology facul'tet.
Specialties: botany; zoology.

F) Geography facul'tet.
Specialties: physical geography; economic geography.

G) Construction engineering facul'tet.
Specialties: industrial and civil construction; agricultural construction; architecture.

H) Mechanical (technology) facul'tet.
Specialties: machine-building technology, metal-cutting machines and instruments; electrical stations, networks and systems; electrification of industrial enterprises and installations.

I) Evening section.
Specialties: machine-building technology, metal-cutting machines and instruments; electrical stations, networks and systems; industrial and civil construction; telegraph and telephone communications.

J) Correspondence section.
Specialties: Latvian language and literature; Russian language and literature; history; mathematics, jurisprudence; physical geography; economic geography.

16) Leningrad Prize Order of Lenin State University im. A. A. Zhdanov
Leningrad, Universitetskaya naberezhnaya, 7/9; established 1819.

A) History facul'tet.
Specialty: history.

B) Economics facul'tet.
Specialty: political economics.

C) Philosophy facul'tet.
Specialties: philosophy; psychology.

D) Philology facul'tet.
Specialties: Russian language and literature; Romano-Germanic languages and literature: English language and literature; German language and literature; French language and literature; Spanish language and literature; Swedish language and literature; Norwegian language and literature; Danish language and literature; Italian language and literature; Slavic languages and literature; Polish language and literature; Czech language and literature; Bulgarian language and literature; classic philology: Greek language and literature; Latin language and literature; journalism.

E) Eastern facul'tet.
Specialties: Eastern languages and literature: Chinese language and literature; Korean language and literature; Indian languages and literature; Vietnamese language and literature; Malayan language and literature; Iranian languages and literature; Turkic languages and literature; Arabian languages and literature; Africana.

F) Law facul'tet.
Specialty: jurisprudence.

G) Physics facul'tet.
Specialties: physics; geophysics.

H) Mechanics-mathematics department.
Specialties: mathematics; mechanics; astronomy.

I) Chemistry facul'tet.
Specialty: chemistry.

J) Biology-soil science facul'tet.
Specialties: botany; zoology; physiology of plants; physiology of men and animals; soil science and agrochemistry.

K) Geology facul'tet.
Specialties: geological survey and search for sites of useful mineral deposits; geophysical methods of searches and prospecting of sites of useful mineral deposits; geochemistry; hydrogeology and engineering geology.

L) Geography facul'tet.
Specialties: physical geography; economic geography; meteorology; land hydrology.

M) Evening section.
Specialties: Russian language and literature; history; chemistry; botany; zoology; physical geography; economic geography.

N) Correspondence section.
Specialties: mathematics; history; Russian language and literature; English language and literature; German language and literature; political economics; philosophy; jurisprudence; botany; zoology; physical geography; economic geography; journalism.

17) L'vov State University im. Ivan Franko.
L'vov, Universitetska ul., 1; established 1758.

A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Ukrainian language and literature; Russian language and literature; Slavic languages and literature; Polish language and literature; Czech language and literature; classic philology; Greek language and literature; Latin language and literature.

C) Journalism facul'tet.
Specialty: journalism.

D) Foreign language facul'tet.
Specialties: English language; German language; French language.

E) Law facul'tet.
Specialty: jurisprudence.

F) Physics facul'tet.
Specialty: physics.

G) Mechanics-mathematics facul'tet.
Specialty: mathematics.

H) Chemistry facul'tet.
Specialty: chemistry.

I) Biology facultet.
Specialties: botany; zoology.

J) Geology facul'tet.
Specialties: geological survey and search for sites of useful mineral deposits; geology and prospecting of sites of useful mineral deposits.

K) Geography facul'tet.
Specialties: physical geography; economic geography (in 1956 there is no enrollment for these specialties).

L) Correspondence section
Specialties: history; Ukrainian language and literature; Russian language and literature; mathematics; jurisprudence; botany.

18) Molotov State University im. A. M. Gor'kiy.
Molotov oblastnoy, ul. Genkelya, 1; established in 1916 as an annex to Petrograd University.

A) History-philology facul'tet.
Specialties: history; Russian language and literature.

B) Law facul'tet.
Specialty: jurisprudence.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

D) Chemistry facul'tet.
Specialty: chemistry.

E) Biology facul'tet.
Specialties: botany; zoology.

F) Geology facul'tet.
Specialties: geology and search for sites of useful mineral deposits; hydrogeology and engineering geology.

G) Geography facul'tet.
Specialties: physical geography; economic geography.

H) Technology facul'tet.
Specialties: technology of inorganic substances; metallurgy, equipment and technology of heat treatment of metals.

I) Correspondence section.
Specialties: mathematics; history; jurisprudence; botany; zoology; physical geography; economic geography.

19) Moscow Order of Lenin and Order of the Red Banner of Labor State University im. M. V. Lomonosov.
Moscow, Leninskiye gory; established 1755.

A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Russian language and literature; Romano-Germanic languages and literature: English language and literature; German language and literature; French language and literature; Iranian languages and literature; Turkic languages and literature; classic philology: Greek language and literature, Latin language and literature.

C) Journalism facul'tet.
Specialty: journalism.

D) Philosophy facul'tet.
Specialties: philosophy; psychology.

E) Economics facul'tet.
Specialty: political economics.

F) Law facul'tet.
Specialty: jurisprudence.

G) Physics facul'tet.
Specialties: physics; geophysics.

H) Mechanics-mathematics facul'tet.
Specialty: mathematics; mechanics; astronomy.

I) Chemistry facul'tet.
Specialty: chemistry.

J) Biology-soil science
Specialties: botany; zoology; physiology of plants; physiology; of men and animals anthropology; soil science and agrochemistry.

K) Geology facul'tet.
Specialties: geology and search for sites of useful mineral deposits; geology and prospecting of sites of petroleum and gas deposits; geological survey and search of useful mineral deposits; geophysical methods of searches and prospecting of sites of useful mineral deposits; geochemistry; hydrogeology and engineering geology.

L) Geography facul'tet.
Specialties: physical geography; economic geography; cartography; hydrology of land; meteorology.

M) Correspondence section;
Specialties: mathematics; physics; history; Russian language and literature; journalism; botany; zoology; physical geography; economic geography; political economics; philosophy; English language and literature; French language and literature.

20) Odessa State University im. I. I. Mechnikov.
Odessa, ul. Shchepkina, 12; established 1865.
A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Russian language and literature; Ukrainian language and literature.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

D) Chemistry facul'tet.
Specialty: chemistry.

E) Biology facul'tet.
Specialties: botany; zoology.

F) Geography facul'tet.
Specialties: physical geography; economic geography.

G) Correspondence section.
Specialties: history; Russian language and literature; Ukrainian language and literature; mathematics; physical geography; economic geography; botany; zoology.

21) Rostov State University im. V. M. Molotov.
Rostov-na-Donu, ul. Fridrikha Engel'sa, 15; established 1917
A) History-philogy facul'tet.
Specialties: history; Russian language and literature.

B) Physical-mathematical facul'tet.
Specialties: mathematics; physics; mechanics.

C) Chemistry facul'tet.
Specialty: chemistry.

D) Biology-soil science facul'tet.
Specialties: botany; zoology.

E) Geology-geography facul'tet.
Specialties: physical geography; economic geography.

F) Law facul'tet.
Specialty: jurisprudence.

G) Correspondence section.
Specialties: history; mathematics; Russian language and literature; botany; zoology; physical geography; economic geography.

22) Saratov State University im. N. G. Chernyshevsky.
Saratov, Astrakhanskaya ul., 83; established 1909.
A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialty: Russian language and literature.

C) Mechanics-mathematics facul'tet.
Specialties: mathematics; mechanics.

D) Physics facul'tet.
Specialty: physics.

E) Chemistry facul'tet.
Specialty: chemistry.

F) Biology facul'tet.
Specialties: botany; zoology.

G) Geology facul'tet.
Specialties: geological survey and search for sites of useful mineral deposits; geology and prospecting of sites of useful mineral deposits.

H) Geography facul'tet.
Specialties: physical geography; economic geography.

I) Correspondence section.
Specialties: Russian language and literature; history; mathematics; botany; zoology; physical geography; economic geography.

23) Middle-Asiatic State University im. V. I. Lenin.
Tashkent, ul., Karla Marksa, 32; established 1920.

A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Uzbek language and literature; Russian language and literature; journalism.

C) Eastern facul'tet.
Specialties: Indian languages and literature; Uygur language and literature; Irano-Afghanian languages and literature.

D) Law facul'tet.
Specialty: jurisprudence.

E) Physical mathematical facul'tet.
Specialties: mathematics; mechanics; physics; geophysics.

F) Chemistry facul'tet.
Specialty: chemistry.

G) Biology-soil science facul'tet.
Specialties: botany; zoology; soil science and agrochemistry.

H) Geology facul'tet.
Specialties: geological survey and search for sites of useful mineral deposits; hydrogeology and engineering geology.

I) Geography facul'tet.
Specialties: physical geography; economic geography; hydrology of soil.

J) Correspondence section.
Specialty: jurisprudence.

24) Tadzhik State University.
Stalinabad, ul. Lenina, 17; established 1948.
A) History-philology facul'tet.
Specialties: history; Tadzhik language and literature; Russian language and literature.

B) Law facul'tet.
Specialty: jurisprudence.

C) Economics facul'tet.
Specialties: industrial economics; agricultural economics.

D) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

E) Natural sciences facul'tet.
Specialties: geological survey and search for sites of useful mineral deposits; botany; zoology.

F) Correspondence section.
Specialties: jurisprudence; industrial economics; agricultural economics; trade economics.

25) Tartu State University.
Tartu Estonskoy SSR, ul., Yulikooli, 42; established 1802
A) History-philology facul'tet.
Specialties: history; Estonian language and literature; Russian language and literature; library science and bibliography.

B) Law facul'tet.
Specialty: jurisprudence.

C) Science-mathematics facul'tet.
Specialties: mathematics; physics; chemistry; botany; zoology; physical geography; economic geography.

D) Economics facul'tet.
Specialty: finances and credit.

E) Medical science facul'tet.
Specialties: the healing art; pharmaceutics; stomatology; physical conditioning.

F) Correspondence section.
Specialties: history; Estonian language and literature; Russian language and literature; jurisprudence; mathematics; physical conditioning; library science and bibliography.

26) Tbilisi State University im. I. V. Stalin
Tbilisi, Universitetskaya ul., 1; established 1918.
A) History facul'tet.
Specialties: history; philosophy; psychology.

B) Philology facul'tet.
Specialties: Georgian language and literature; Russian language and literature; journalism; Iranian languages and literature; Turkic languages and literature; semitology.

C) Foreign languages and literature facul'tet.
Specialties: English language and literature; German language and literature; French language and literature.

D) Economics facul'tet.
Specialties: finances and credit; accounting.

E) Law facul'tet.
Specialty: jurisprudence.

F) Mechanics-mathematics facul'tet.
Specialties: mathematics; mechanics.

G) Physics facul'tet.
Specialty: physics.

H) Chemistry facul'tet.
Specialty: chemistry.

I) Biology facul'tet.
Specialties: botany; zoology.

J) Geology-geography facul'tet.
Specialties: physical geography; economic geography; geological survey and search for sites of useful mineral deposits.

K) Correspondence section.
Specialties: accounting; finances and credit; industrial economics.

27) Tomsk State University im. V. V. Kuybyshev.
Tomsk, prospekt Timiryazeva, 3; established 1888.
A) History-philology facul'tet.
Specialties: history; Russian language and literature.

B) Economics-law facul'tet.
Specialties: jurisprudence; planning of national economy; agricultural economics.

C) Physics facul'tet.
Specialty: physics.

D) Mechanics-mathematics facul'tet.
Specialties: mathematics; mechanics.

E) Chemistry facul'tet.
Specialty: chemistry.

F) Biology-soil science facul'tet.
Specialties: botany; zoology.

G) Geology-geography facul'tet.
Specialties: geological survey and search for sites of useful mineral deposits; geochemistry; physical geography; economic geography; soil hydrology; meteorology.

H) Correspondence section.
Specialties: history; Russian language and literature; mathematics; botany; zoology; physical geography; economic geography.

28) Turkmen State University im. A. M. Gor'kiy.
Ashkhabad, Pervomayskaya ul., 133

A) Philology facul'tet.
Specialties: Turkmen language and literature; Russian language and literature; English language; German language.

B) History-law facul'tet.
Specialties: history; jurisprudence.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

D) Technology facul'tet.
Specialties: industrial and civil construction (engineering); water supply and sewers.

E) Biology-geography facul'tet.
Specialties: botany; zoology; physical geography.

F) Physical culture facul'tet.
Specialty: physical culture.

G) Evening section.
Specialties: history; Turkmen language and literature; Russian language and literature; mathematics; English language.

H) Correspondence section.
Specialties: Turkmen language and literature; Russian language and literature; mathematics; jurisprudence; history; physics; botany; zoology; physical geography.

29) Uzhgorod State University.
Uzhgorod Ukr. SSR, pl. Gor'kogo, 1/3; established 1945.
A) History-philology facul'tet.
Specialties: history; Ukrainian language and literature; Russian language and literature.

B) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

C) Chemistry facul'tet.
Specialty: chemistry.

D) Biology facul'tet.
Specialties: botany; zoology.

E) Medical science facul'tet.
Specialty: the healing arts.

F) Correspondence section.
Specialties: history; Ukrainian language and literature; Russian language and literature; mathematics; botany; zoology.

30) Uzbek State University im. Alisher Navoi.
Samarkand, bul'var Gor'kogo, 15; established 1933.
A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Uzbek language and literature; Tadzhik language and literature; Russian language and literature; English language; German language.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

D) Biology facul'tet.
Specialties: botany; zoology.

E) Evening section.
Specialties: history; mathematics; Uzbek language and literature; Tadzhik language and literature; Russian language and literature.

F) Correspondence section.
Specialties: history; Uzbek language and literature; Tadzhik language and literature; mathematics; physics; obtany; zoology.

31) Ural State University im. A. M. Gor'kiy.
Sverdlovsk, u., Belinskogo, 71-a; established 1920
A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Russian language and literature; journalism.

C) Physical-mathematical facul'tet.
Specialties: mathematics; mechanics; physics.

D) Chemistry facul'tet.
Specialty: chemistry.

E) Biology facul'tet.
Specialties: botany; zoology.

F) Geology facul'tet.
Specialties: geological survey and search of sites of useful mineral deposits; geology and prospecting of sites of useful mineral deposits.

G) Correspondence section.
Specialties: history; Russian language and literature; mathematics; physics; journalism; botany; zoology.

32) Khar'kiv State University im. A. M. Gor'kiy.
Khar'kiv, Universitetska ul., 16; established 1805.

A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Ukrainian language and literature; Russian language and literature.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics; astronomy.

D) Chemistry facul'tet.
Specialty: chemistry.

E) Biology facul'tet.
Specialties: botany; zoology.

F) Geology facul'tet.
Specialties: hydrogeology and engineering geology; geological survey and search for sites of useful mineral deposits.

G) Geography facul'tet.
Specialties: physical geography; economic geography.

H) Correspondence section.
Specialties: history; Ukrainian language and literature; Russian language and literature; mathematics; physical geography.

33) Chernovtsy State University
Chernovtsy UkR. SSR, Universitetskaya ul., 28; established 1875, Soviet established 1940.

A) History facul'tet.
Specialty: history.

B) Philology facul'tet.
Specialties: Ukrainian language and literature; Russian language and literature; German language and literature.

C) Physical-mathematical facul'tet.
Specialties: mathematics; physics.

D) Chemistry facul'tet.
Specialty: chemistry.

E) Biology-soil science facul'tet.
Specialties: botany; zoology.

F) Geography facul'tet.
Specialty: physical geography.

G) Correspondence section.
Specialties: history; Ukrainian language and literature; Russian language and literature; English language and literature; mathematics; economic geography.

Note: The data in this Appendix was compiled from the "Handbook for Enrolling in Institutions of Higher Education" - 1956 (Spravochnik dlya postupayushchikh v vysshyye uchebnyye zavedeniya) "Sovetskaya Nauka," Moscow, 1956; and "Education in USSR" (Prosveshcheniye v SSSR) by Ye. N. Medinskiy, Akad. Pedag. Nauk R.S.F.S.R. Moscow, 1955.

# APPENDIX II

## Aviation Institutes of USSR

1) Kazan' Aviation Institute.
Kazan', ul. Karla Marksa, 10.
Has an evening section.

2) Kuybyshev Aviation Institute.
Kuybyshev, Molodogvardeyskaya ul., 151.
Has an evening section.

3) Leningrad Aviation Institute.
Leningrad, ul. Gastello, 9.
Has an evening section.

4) Moscow Aviation Technology Institute.
Moscow, Strastnoy bul'var, 16.
Has an evening section.

5) Moscow Order of Lenin Aviation Institute im. Sergo Ordzhonikidze.
Moscow, Volokolamskoye shosse, 18.
Has an evening section.

6) Ufa Aviation Institute im. Sergo Ordzhonikidze.
Ufa, ul. Lenina, 61.
Has an evening section.

7) Khar'kiv Aviation Institute.
Khar'kiv, Sumska ul., 18/20
Has an evening section.

8) Shcherbakov Evening Aviation Institute.
Shcherbakov, Yaroslav oblast'.
Specialties: construction and technology of radio apparatus industry; machine construction technology, metal-cutting lathes and and instruments; machinery and technology of pressure metal-working; machinery and technology of the smelting industry.

9) Kiev Institute of the Civil Air Fleet im. K. Ye. Voroshilov.
Kiev, Poleva ul., 103-6
Has a correspondence section.

# APPENDIX III

## Statistics on Soviet Schools of General Education

The following statistical tables were taken from "National Economy of USSR - Statistical Collection," Moscow, 1956, published by the Central Statistical Administration of the Soviet Ministers of USSR, pp. 221, 227, 229, 233, 235 respectively.

Table A

Numbers of Students in Schools of General Education and Higher Educational Institutions

| | 1927/8 | 1940/1 | 1950/1 | 1954/5 | 1955/6 |
|---|---|---|---|---|---|
| In elementary, 7-year and 10-year schools, in schools of worker, rural youths and adult schools (thousands) | 11,589 | 35,528 | 34,752 | 31,486 | 30,070 |
| In higher educational institutions (including correspondence students) thousands) | 169 | 812 | 1,247 | 1,730 | 1,867 |

TABLE B

Graduation of Specialists in USSR from Higher Educational Institutions

| | First 5-year plan ('29-'32) | Second 5-year plan ('33-'37) | Three yrs of third 5-year pl. ('38 - '40) | War years (1941-1945) | Fourth 5-year plan ('46-'50) | Fifth 5-year plan ('51-'55) |
|---|---|---|---|---|---|---|
| Graduated during the whole period | 170 | 370 | 328 | 302 | 652 | 1,121 |
| among them: | | | | | | |
| not including correspondence students | 170 | 370 | 304 | 286 | 561 | 874 |
| correspondence students | - | - | 24 | 16 | 91 | 274 |
| Graduated per year (average) | 42.5 | 74.0 | 109.4 | 60.4 | 130.4 | 224.2 |
| among them: | | | | | | |
| not including correspondence students | 42.5 | 74.0 | 101.4 | 57.2 | 112.2 | 174.8 |
| correspondence students | - | - | 8.0 | 3.2 | 18.2 | 49.4 |

## Table C

## Numbers of Scientific Workers in USSR (in thousands)

| | By October 1 | | |
|---|---|---|---|
| | 1950 | 1954 | 1955 |
| Total number of scientific workers | 162.5 | 210.2 | 223.9 |
| Including: | | | |
| In science-research establishments | 70.5 | 88.7 | 96.5 |
| In higher educational institutions | 86.5 | 114.2 | 119.1 |
| In industry, administration, etc. | 5.5 | 7.3 | 8.3 |
| From the total number of scientific workers | | | |
| holding the degree of | | | |
| Doctor of Sciences | 8.3 | 9.0 | 9.5 |
| Candidate of Sciences | 45.5 | 69.2 | 78.0 |
| holding the title of | | | |
| Professor | 8.9 | 8.8 | 9.0 |
| Docent | 21.8 | 26.8 | 28.6 |
| Senior Research Fellow | 11.4 | 14.0 | 14.6 |
| Junior Research Fellow and Assistant | 19.6 | 16.2 | 17.1 |

Table D

Numbers of Aspirants (grad. students working for the degree of Candidate of Sciences) in USSR at end of years indicated

| | 1940 | 1950 | 1955 |
|---|---|---|---|
| Total number of aspirants (thousands) | 16.9 | 21.9 | 29.4 |
| Including: | | | |
| In higher educational institutions | 13.2 | 12.5 | 16.8 |
| In science-research establishments | 3.7 | 9.4 | 12.6 |

Table E

Aspirants Graduating (at end of year indicated) in USSR

| | 1940 | 1950 | 1955 |
|---|---|---|---|
| Total number of aspirants graduated | 1,978 | 4,093 | 7,607 |
| Including: | | | |
| By higher educational institutions | | | |
| non-working aspirants | 1,411 | 2,281 | 4,263 |
| aspirants working in industry at time of graduation | 61 | 180 | 489 |
| By science-research establishments | | | |
| non-working aspirants | 454 | 1,368 | 2,273 |
| aspirants working in industry at time of graduation | 52 | 264 | 582 |

Table F

Enrollment of Aspirants (at end of year indicated) in USSR

| | 1940 | 1950 | 1955 |
|---|---|---|---|
| Total number of aspirants enrolled | 3,530 | 7,717 | 7,367 |
| Including: | | | |
| non-working aspirants | 2,782 | 6,377 | 5,384 |
| aspirants working in industry | 748 | 1,340 | 1,983 |
| From the total number of aspirants, enrolled | | | |
| In higher educational institutions | 2,768 | 4,763 | 4,193 |
| Including: | | | |
| non-working aspirants | 2,223 | 4,253 | 3,225 |
| aspirants working in industry | 545 | 530 | 968 |
| In science-research institutes | 768 | 2,934 | 3,174 |
| Including: | | | |
| non-working aspirants | 559 | 2,124 | 2,159 |
| aspirants working in industry | 203 | 810 | 1,015 |