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ACADEMY OF SCIENCES OF THE KAZAKH SSR¹

The Academy of Sciences of the Kazakh Soviet Socialist Republic (AN KazSSR) is one of the fourteen academies under the jurisdiction of the nominally independent union republics (in contrast with the "federal" status of the USSR Academy of Sciences).

Of the fifteen republics of the USSR only the largest, the Russian Republic (RSFSR), has no academy of its own.* The seeming asymmetry in the network of the academies of sciences derives from the history of these institutions and reflects the pre-eminent role of the Russian Republic in the formation of the Soviet Union.

After the February Revolution in 1917 the Imperial Academy of Sciences was renamed the Russian Academy of Sciences. For a time it remained the only institution of its kind within the present territory of the Soviet Union. A second, the Ukrainian Academy of Sciences, was established in 1919. In 1925, however, three years after the formation of the Soviet Union, the Russian Academy was renamed the Academy

*The Siberian Division of the USSR Academy of Sciences, however, is accountable both to its parent institution and the RSFSR Council of Ministers. M. V. Keldysh, president of the USSR Academy of Sciences, stated that in consequence of the 1963 reorganization that in all activities except in the election of its members the Siberian Division ". . . shall possess the rights of a republic academy of sciences" (Vestnik Akademii nauk SSSR, No. 6, June 1963, p. 20).

of Sciences of the USSR--to emphasize its national status and the expanded scope of its activities. The USSR Academy gradually established a number of branch institutions (filialy) both in the RSFSR and in other union republics. Nine of such branches of the USSR Academy--in the Uzbek, Kazakh, Georgian, Azerbaidzhan, Kirghiz, Tadzhik, Armenian, Turkmen, and Moldavian Republics--were eventually reorganized as the academies of sciences of the corresponding republics. Thus the origin of the Kazakh Academy is typical of that of the majority among the Soviet academies of sciences under the union republic jurisdiction.

History

The history of the AN KazSSR goes back to the establishment of a Kazakh Station (baza) of the USSR Academy of Sciences in 1932. The Kazakhstan Station originally included two sections: zoological and botanical. A botanical garden in Alma-Ata was started also in 1932.

In 1938 the Station was reorganized as the Kazakh Branch (filial) of the USSR Academy of Sciences (KazFAN). By 1939 the Kazakh Branch had seven sections, as follows:

- Zoology (1932)
- Botany (1932)
- Geology (1935)
- History (1935)
- Kazakh language and literature (1936)
- Folk creativity (tvorchestvo) (1936)
- Soil sciences (1939)

Four botanical gardens assigned to the Academy were located in:

Alma-Ata (1932)
 Balkhash (1935)
 Leninogorsk (1935)
 Karaganda (1939)

Until World War II the Kazakh Branch of the USSR Academy was a small institution. In 1941 its total staff numbered only 111 individuals in the following academic categories:

Doctors of sciences	3
Candidates of sciences	14
University graduates without advanced degrees	72
Graduate students	22
	<hr/>
	111

The Branch had only one research institute (Institute of Geological Sciences) and only two laboratories. Its annual research budget was only 3.9 million (pre-1961) rubles.*

A period of rapid growth set in with the outbreak of World War II. With the German occupation of the Ukraine and other areas in the European USSR, the agricultural and industrial resources of Kazakhstan counted heavily for the support of the Soviet war effort. Kazakhstan also served as a major relocation area for industrial and other organizations evacuated from the war zone, including research and development facilities and personnel.

Among other metropolitan scientists who during this period were stationed at the Kazakh Station for extended periods were Academicians

*Or .39 million "new" rubles introduced on January 1, 1961 at the rate of one new ruble for ten old rubles.

I. P. Bardin (1883-1960, metallurgy), A. A. Baikov (1870-1946, metallurgy), V. A. Obruchev (1863-1956, geography), A. A. Skochinski (1874- , mining engineering), N. B. Tsitsin (1898- , botany), and D. N. Pryanishnikov (1865-1948, agrochemistry).

During World War II the permanent staff of the Kazakh Branch was increased by the transfer of certain faculty members of the Alma-Ata institutions of higher education to the Academy, by the assignment of current graduates of these institutions, and by the mobilization of other individuals. Within a five-year period (1941-1946) the permanent staff of the Kazakh Branch increased from 111 to 872 persons, the number of research institutes from 1 to 16, and its research budget from 3.9 to 45.2 million rubles. On June 1, 1946 the Kazakh Branch of the USSR Academy was reorganized into the Academy of Sciences of the Kazakh SSR (An KazSSR).

In 1949 the Academy had 3 honorary members, 13 active members, and 15 corresponding members; the total number of scientific workers in the Academy in 1949 was "more than 1,000."² As shown in Table 1, by 1957 its professional staff had increased to 1,355 individuals, the number of research institutes to 21, and the budget to 91.9 million rubles.

Table 1

THE KAZAKH ACADEMY OF SCIENCES

Selected Data on the Growth of the Academy from 1941
to 1946 (as Kazakh Affiliate of the AN USSR) and
from 1946 to 1960

	1941	1946	1957		1959	1960	
	Number	Number	Number	Per Cent	Number	Number	Per Cent
Doctors of sciences	3	57	88	3	1,500	90	2
Candidates of sciences	14	184	480	15		517	10
VUZ graduates	72	503	652	21		1,085	22
Resident graduate students	22	128	135	4			
Professional staff	111	872	1,355	53		1,700	34
Supporting personnel			1,776*	57		3,300	66
Total staff			3,131	100		5,000	100
Budget (million rubles)	3.9	45.2	91.9		150**		
Number of institutes	1	16	21		25	29	
Projects in progress	60	368	341				
Field expeditions	23	141	220				

*1,176 laboratory and other technicians and 600 clerical and service personnel.

**"More than 150 million rubles" (Source 2).

Note: In 1961 the total staff was reported at "over 6,100 workers" (K. I. Satpayev in Vestnik Akademii nauk Kazakhskoi SSR, No. 8, August 1961).

Sources: (1) Nauka v Kazakhstane za sorok let sovetskoi vlasti /Science in Kazakhstan during the Forty Years of the Soviet Rule/, Alma-Ata: Kazakh Academy of Sciences Press, 1957, pp. 36-48.

(2) Vestnik Akademii nauk Kazakhskoi SSR, No. 5, May 1960.

(3) Nauka Sovetskovo Kazakhstana, 1920-1960 /Soviet Kazakhstan Science, 1920-1960/, Alma-Ata: AN KazSSR Press, 1960.

In 1957 the Academy had 42 "scientific institutions" (of which 21 were rated as nauchno-issledovatel'skiye, i.e., research institutes) distributed as follows (see also Table 2):

Department of Mineral Resources--10 institutions

8 Institutes:

Geological Sciences
Mining
Metallurgy and Ore Concentration
Refractory and Construction Materials*
Energetics
Chemical Sciences
Petroleum (at Gur'ev)
Mining-Metallurgical (at Ust'Kamenogorsk)

1 Sector:

Geography

1 Republican Geological Museum

Department of Physico-Mathematical Sciences--8 institutions

2 Institutes:

Astronomy and Astrophysics
Nuclear Physics (1957)

3 Sectors:

Mathematics and Mechanics
Astrobotany
Computational Mathematics

1 Astrophysical Laboratory

2 High-Altitude Stations:

Corona Station
Station for the Study of Cosmic Rays

*In 1959 this institute was transferred to the Kazakh Affiliate of the All-Union Academy of Construction and Architecture.

Department of Biological and Medical Sciences--12 institutions

7 Institutes:

Soil Science
 Botany
 Zoology
 Physiology
 Regional Pathology
 Clinical and Experimental Surgery
 Microbiology and Virusology

3 Botanical Gardens (Alma-Ata, Karaganda, and Leninogorsk)*

2 Experimental Bases

Department of Social Sciences--6 institutions

3 Institutes:

Language and Literature
 History, Archaeology, and Ethnography
 Economics

3 Sectors:

Study of the Arts
 Philosophy and Law
 Oriental Studies

The Presidium of the Academy--5 institutions

Editorial-Publishing Council
 Council for the Study of Productive Forces of the Republic
 Commission for the Combat of Silicosis**
 Committee for the Preservation of Nature
 Commission on the History of Science and Technology

Scientific Library of the Academy (800,000 volumes in 1957)

*The Balkash Botanical Garden, which was established in 1935, was not mentioned in the 1957 listing.

**In 1959 this organization was transferred to the Scientific-Technical Committee of the Council of Ministers, Kazakh SSR.

Table 2

KAZAKH ACADEMY OF SCIENCES
Organization by Type of Institutions
1957 and 1960

Divisions	Scientific Institutions					
	Institutes		Other		Total	
	1957	1960	1957	1960	1957	1960
Mineral Resources	8	10	2	13	10	23
Physico-Mathematical	2	6	6	3	8	9
Biological and Medical	7	8	5	13	12	21
Social Sciences	3	5	3	-	6	5
Presidium of the Academy	-	-	5	-	5	-
Subtotal	20	29	21	29	41	58
Library			1	1	1	1
Total number, institutions	20	29	22	30	42	59

Sources: See Table C-1.

The preceding list of 42 institutions accounts for the 1957 structure of the Kazakh Academy. By 1959 the number of institutions had increased to 55, of which 25 were rated as research institutes.³ In this category of major scientific institutions the new Chemico-Metallurgical Institute in Karaganda exemplifies the increasing emphasis on the Academy's support of industrial development. This institute was organized under the Academy's Department of Mineral Resources in 1958 by the consolidation of several industrial laboratories and other facilities in Karaganda.⁴ Academician K. I. Satpayev, the president of the Kazakh Academy, stated that this institute is concerned with the development of the ferrous and non-ferrous mining, and of the coal and chemical industries of the region.⁵

Other recent additions to the list of research institutions of the Kazakh Academy include the following institutes:

Chemical Sciences
 Chemistry of Petroleum and of Mineral Salts*
 Geology of Petroleum and of Natural Gas*
 Ichthyology and Fisheries (with branches at the Aral Sea,
 Lake Zaisan, and Lake Balkhash)**

*Created by the reorganization of the former Petroleum Institute.

**The Aral Branch was formerly a branch of the All-Union Scientific Research Institute of Deep-Sea Fisheries and Oceanography. The Balkhash Branch was transferred to the Academy from the All-Union Scientific Research Institute of Lake and River Fisheries.

Also recently, the former Sector on Philosophy and Law in the Department of Social Sciences has been reorganized and given a new status as the Institute of Philosophy and Law.

Whatever the role of the Academy's department of social science, the major objective of the Academy's activities is the development of the regional industries. In the previously cited Pravda article Academician Satpayev stated that the most important research of the Kazakh Academy "is dedicated to the study of the very rich mineral resources of the republic, to the problems of their exploitation, and the technical progress of the heavy industries."

Correspondingly, the expansion of research facilities of the Kazakh Academy in recent years has taken place primarily in the industrially oriented sectors. That the trend is likely to continue is suggested, for example, by a recent article on the problems of research and development for the automation of industrial processes in Kazakhstan. Advocating the establishment of a special institute for automation and telemechanics within the Kazakh Academy, the author emphasized that such an institute "by all means should have an engineering and not at all a theoretical physico-mathematical orientation [profil']."6

Personnel

As of January 1, 1958 the total number of individuals associated with the Academy was given as 3,549 of which 1,400 were referred to

as "scientific workers."⁷ Among the scientific workers there were:

Academicians, AN SSSR	2
Corresponding members, AN SSSR	1
Academicians, AN KazSSR	32
Corresponding members, AN KazSSR	27
Doctors of sciences	92
Candidates of sciences	478

An election of academicians and of corresponding members was held in 1958. The notice of election which appeared in Kazakhstanskaya Pravda (March 25, 1958) listed 24 vacancies.

By 1959, with the election of the academicians and corresponding members to fill these vacancies, the membership rose to 40 academicians and 36 corresponding members.* At the same time (by the end of 1959) the total number of scientific workers increased to 1,500--a gain of 100 in approximately two years.⁸

Estimate of the Academy Payroll

Using the personnel data in Table 1 and the assumed average salaries in each category, the Academy's 1957 payroll may have been approximately as follows:

*In addition to the academicians and corresponding members the Academy had two honorary members.

	<u>Rubles/Year</u>	<u>Million Rubles</u>
88 Doctors	@ 48,000	4.2
480 Candidates	@ 30,000	14.4
652 <u>Sotrudniki</u>	@ 15,000	9.8
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Subtotal: "Scientific Workers"		
1,220 @ <u>23,282 ave.</u>		28.4
<hr/>		
1,176 Technicians	@ 10,000	11.8
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Subtotal: Technical Staff		
2,396 @ <u>16,777</u>		40.2
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600 Nontechnical workers	@ 6,000	3.6
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Total employees		
2,996 @ <u>14,620</u>		43.8

As estimated, the salary component would account for approximately 47.7 per cent of the 1957 budget of 91.9 million rubles, which happens to be very close to the 48.5 per cent share provided for salaries in the "science" budgets of the union republics in 1957.⁹ It may serve as a first approximation for the evaluation and analysis of certain budget-personnel data. This estimate suggests that in round figures the yearly cost of research and development personnel in republic academies may be approximated on the following basis:

	<u>Rubles</u>
1. "Scientific workers" (university graduates including the holders of advanced degrees) Average salary per year	24,000
2. "Scientific" and "scientific-technical" workers Average salary per year	17,000
3. All employees of the republic academies of sciences Average salary per year	15,000

Graduate Training Facilities

Most of the institutions of the Academy have graduate training programs, and a few are also authorized to accept dissertations defended for the degrees of candidate and doctor of sciences. The institutions listed below are correspondingly coded: A - aspirantura, graduate training; C - candidate dissertations; and D - doctoral dissertations.¹⁰

Institutes:

A	Astrophysical
A	Nuclear Physics
ACD	Geological Sciences
A	Mining
AC	Metallurgy and Ore Concentration
A	Construction and Construction Materials
AC	Power
A	Petroleum
A	Mining-Metallurgical (Altai Institute)
A	Chemical Sciences
A	Botanical
A	Zoological
A	Microbiology and Virusology
A	Soil Sciences
AC	Physiology*
AC	Regional Pathology*
AC	Clinical and Experimental Surgery*
ACD	History, Archeology, and Ethnography**
A	Economics
ACD	Language and Literature**
A	Philosophy and Law

Other Institutions:

A	Astrobotanical Sector
A	Mathematics and Mechanics Sector
A	Laboratory of Mechanized Computation Mathematics
A	Geography Sector
A	Sector of the Arts
A	Sector on the Study of Productive Resources
A	Sector of Oriental Studies

*Candidate dissertations accepted by the Joint Council of these 3 institutions.

**Dissertations accepted by the Joint Council of these 2 institutions.

No comprehensive statistics on the graduate training are given in the sources used for this outline. One source, however, gives the number of doctoral and candidate dissertations defended in 1958 and 1959 as follows:¹¹

<u>Year</u>	<u>Doctoral</u>	<u>Candidate</u>
1958	5	60
1959	3	37

The same source comments on the status of graduate training at the Academy as follows:

There must be an improvement in the selection of young specialists graduated from higher educational institutions. Heads of scientific institutions must establish close liaison with higher educational institutions and recruit gifted young persons for the Academy.

The state of training of our young scientific personnel gives cause for alarm. It must be emphasized that the future development of the Academy--the creation of new institutes and the strengthening of existing ones--depends entirely upon the preparation of young personnel: doctors and candidates of sciences. Yet recent years have seen a sharp drop in the number of dissertations for the academic degree of doctor and candidate of sciences.

The training of personnel is extremely inadequate in such branches of science as automatics, telematics, the chemistry of polymers, computer engineering, mathematical physics, etc.

The Institute of Nuclear Physics is doing a completely unsatisfactory job of training scientific personnel.

The Academy possesses great possibilities for training doctors and candidates of sciences. But these possibilities are not being utilized.¹²

Notes

¹Except as otherwise noted, the data are from Nauka v Kazakhstane za sorok let sovetsoi vlasti, Alma-Ata: Kazakh Academy of Sciences Press, 1957, pp. 36-48.

²Bol'shaya Sovetskaya Entsiklopediya [Soviet Large Encyclopedia], 2nd ed., Vol. 1, 1949, p. 568.

³Kazakhstanskaya Pravda, June 4, 1960, p. 3:7.

⁴Ibid., September 21, 1958, p. 4, and August 5, 1959, p. 4.

⁵"Nauka i tekhnicheskii progress" [Science and Technical Progress], Pravda, August 15, 1960, p. 2.

⁶"Vmeste s praktikami" [Together with the Practical Men], Kazakhstanskaya Pravda, June 4, 1959, p. 2.

⁷Vestnik Akademii nauk Kazakhskoi SSR (Alma-Ata), No. 6, June 1958.

⁸Narodnoye khozyaistvo SSSR v 1959 godu [The National Economy of the USSR in 1959], Moscow: Gosstatizdat, 1960, p. 759.

⁹Raskhody na sotsial'no-kul'turnye meropriyatiya po gosudarstvennomu byudzhetu SSSR [USSR Budget Expenditures for Socio-Cultural Purposes], Moscow: Gosfinizdat, 1958, p. 60:

	<u>Million Rubles</u>	<u>Per Cent</u>
Total republics "science" budgets	2,706.8	100.0
Salaries	1,312.2	48.5

^{10A}. V. Topchiev, ed., Nauchnyye kadry s SSSR [Scientific Manpower in the USSR], Moscow: The USSR Academy of Sciences Press, 1959, pp. 154, 180, and 189.

¹¹"Current Activities of the Kazakh Academy of Sciences" (JPRS: 5682), September 26, 1960 (mimeographed translation of selected articles from Vestnik Akademii nauk Kazakhskoi SSR, No. 5, May 1960).

¹²Ibid., p. 37.