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REPORT ON HISTORY OF SCIENCE IN USSR

A visit to USSR for two months from 17 May, 1983 to 16 July, 1983 was made by the reporter on an invitation from USSR Academy of Sciences which was approved by the Indian National Science Academy under Indo-Soviet Joint Collaborative Programme to study the status of History of Science in USSR, establish contacts with Historians of Science of USSR working in Indian as well as Central Asian Sciences and explore the scope for future plan for History of Science under Indo-Soviet Joint Collaborative Programme operative between the INSA and the USSR Academy of Sciences.

Centres of History of Science

A large number of research institutes under Republican Academy of Sciences in Moscow, Tashkent, Samarkhand, Dushanbe and Leningrad are at present engaged in the study of History of Science. The report is prepared on the basis of visit to these places.

Moscow: In Moscow the Institute of History of Science and Natural Technology is a large organization exclusively devoted to the study of History of Science. The institute at present has sections on History of Mathematics, Physics, Chemistry, Science about the Earth and History of Engineering, History of modern revolution, general problems of development of Natural Science, History and theory of the organization of scientific activities, problems of scientific creative work, sociological problems of science, socio-economic problems of the USSR Academy of Sciences, systematic studies of science and history of international scientific links. Internationally known scholars, Prof. S. R. Mikulinsky (Director), Prof. A. P. Yuskevitch (Head of the Department of History of Mathematics), Professor A. T. Gregory (Head of the Department of Physics) and others are associated with this organization. The Institute has focussed its attention on fundamental works on individual problems and trends of development of Natural Science and Engineering. The Presidium provided guidelines for the Institute's research activities and resolved that its basic task was to tackling of problems of the World History of Natural Sciences and Engineering at all its major stages especially in the 19th and 20th centuries. It was recommended that the Institute should study the history of Natural Science and Engineering with all their branches as a component of world history. The institute was also entrusted with establishing close contacts with scientists of Academy's various other institutes, Republican Academy of Sciences and country's colleges and universities. The Institute offers excellent opportunities to conduct comprehensive studies on scientific development and deepen the historico-scientific and historico-technological investigations. Since 1953, the Institute has prepared 700 monographs including 148

on History of Physics and Mathematics, 92 on History of Biology, 141 on general problems of the history of Natural Sciences, 102 on the History of Engineering, 15 on the problems of scientific and technological revolution, 16 biographies and dictionaries etc. A seminar on "Indian *Śriyantra* and its mathematical characteristics" was organised at the Institute by A. P. Kulaichev of the Moscow University. The modified version of Kulaichev's paper has been submitted for publication in the *Indian Journal of History of Science*. The Institute of Oriental Studies, Lenin Library, Polytechnical Museum, Moscow University are good source centres for studies in History of Science.

Tashkent: The Uzbek Academy of Science at Tashkent does not have a full fledged institute in History of Science, but almost every institute under this Academy has some openings for studies in this field. Prof. H. Sirazdinov, the Vice-President of the Presidium is a great exponent of History of Mathematics and Astronomy and his two students, Prof. G. P. Matvievskaya of the Institute of Mathematics and Dr. Asraf Akhmedov of the Institute of Oriental Studies, are renowned scholars of History of Astronomy. Both these scholars have published many papers and books relating to contributions of Central Asia to World Knowledge of Astronomy. Prof. H. Khairullaev (Director), Prof. Sabohat Azinijanova (expert on Sources), Prof. I. M. Hashimov (expert on Science of Science) are associated with the Institute of Oriental Studies. The Institute has a big manuscript library which is a rich centre for study of History of Science in Central Asian and Indian contexts. It contains also five manuscripts of *Zij-i-Muhammad Sahi* containing details of astronomical observation of Jai Singh and contains many important manuscripts of Indian and Central Asian interest. Many scholars from Central Asia travelled to India during Mughal rules and details of their travel accounts are available in this library. Prof. Shalakhuddinov (Director of the Institute of Mathematics), Prof. K. K. Khanjarov (Director) and Prof. A. F. Faisullaev (Prof. of History of Mathematics) at the Institute of Philosophy, Prof. Latipov (Institute of Astronomy) showed great interest and emphasised on the importance of the subject.

Samarkhand: In Samarkhand, the important places of attraction were Institute of Archaeology, Ulug Beg Observatory and a few museums relating to Central Asia. Ulug Beg, grandson of Tamarland (born on 22 March, 1394) built up an observaroty in 1428-29 A.D. on Kukhak hills in Samarkhand. Prominent scholars who helped in this project were Giyasuddin Djemshed, Salahuddin Musa Ibn Muhammad Kaji-Zade Rumi, Ali Kushchi and Giyasuddin Al-Chusti. Only a part of the huge sextant of the observatory now remains. According to Babur's description, the observatory was a three-storied building with an exquisite ceramic work. Ulug Beg established two Madrassas at Bukhara and Gizhduvan and collected a large number of books from different parts of Central Asia and India. The museum of Ulug Beg contains a few copies of his manuscripts and instruments. Ulug Beg's catalogue of 683 towns were very famous in Central Asia, Armenia and other places including India.

Dushanbe: Prof. M. S. Asimov, President of Tazik Academy of Science Institute

of History. is a great scholar of History of Science. He is also the Director of Institute of Oriental Studies at Dushanbe. The Institute has planned to published ten volumes of manuscript catalogues out of which five have already seen the light of the day. The studies include scientific description of manuscripts in Arabic, Persian and Tajik and Firdausi's epic *Shahnamah*. Volumes on Biruni and other scholars have been published. Of great interest are the studies of the development of engineering and production processes, socio-economic relations in Central Asia of ancient times and the middle ages. Many research programmes are carried out on request coming from factories, farms, ministries, top economic and government bodies, design and research organization. Such programmes are primarily concerned with plans for socio-economic developments. Prof. R. P. Baratov, Vice-President of the Presidium, Prof. H. M. Said Muradov, the learned Secretary of the Presidium, Prof. B. I. Iskandarov, Prof. K. S. Aini, Prof. G. Nabruz, Dr. I. Hojiev (Historian of Mathematics), Prof. N. N. Nigmatov (Historian of Science), and Prof. Lev Nikolaevich of the Institute of Astrophysics showed great interest in the joint bilateral Indo-Soviet exchange programme in History of Science and requested to send more materials on Indian sciences. They also showed interest for joint project on Central Asian and Indian Sciences.

Leningrad: Leningrad branch of History and Philosophy of Natural Science and Engineering, Leningrad branch of USSR Academy of Science, Lomenosev Museum on Chemistry and Astronomical observatory, Anthropological Museum, St. Peter's Observatory, Hermitage and Institute of Oriental Studies of Academy of Science are of interest to the Historian of Science. Dr. E. P. Karpeyer (Head of the Leningrad Branch of History of Natural Science), Dr. E. P. Ozigova (History of Mathematics) and Prof. N. I. Nebskaya (History of Astronomy), Prof. Bladimir Filov (Director of the Academy of Science Library) and many other scientists explained the structure and role of the USSR Academy in the development of Science. A series of volumes have been planned to assess the role of the USSR Academy in the development of all the major branches of Science. Two volumes have already been published. The records of St. Peter's Observatory mentioned that one Indian scholar was associated in its observation work. The Indian Calendar by Euler was also printed in Latin (18th century). A comparative assessment may help us to know the exact nature of transmission in the field of astronomical knowledge. The scholars showed interest for joint venture in the bilateral and international activities in the field of science.

Status and Characteristics of History of Science and Technology in USSR

In 1921, first scientific bodies in Moscow came up for studying the History and Natural Science & Engineering under the guidance of the Commission for the study of History of Science, Philosophy, and Engineering under the auspices of the Academy of Science. The Commission was renamed later as the Commission for Knowledge.

In 1945, the Institute for History of Natural Sciences was set up within the framework of USSR Academy of Science. In 1953, the Institute of History of Natural Sciences was merged with the History of Technology and renamed as Institute of the History of Natural Sciences and Technology.

As per constitution, the Institute also was given power for presentation of historical movements. Accordingly special groups were formed for identifying, studying and recording movements of history of science and engineering.

The institute also attach great importance to the training of scientists. Many post-graduates have been trained and doctorate theses have been prepared on history of physics, mathematics, chemistry, biology, geography, geology, mineralogy, technical sciences and successfully defended for the doctorate degrees. Total staff strength of the institute is at present 152 and each sector is supported with specialists to study development of sciences of other major cultural areas.

Every year the scientific conferences of post-graduates and young specialists in history of natural sciences and engineering are organised which involve also men of science from many Soviet towns and research centres. The leading scientific institutions which study the History of Natural Sciences and Engineering co-ordinate all research work in the field. An Association known as Soviet National Association of the Historians of Natural Sciences and Technology was also active from 1956 to study the major problems in the fields of History of Natural Sciences and Engineering. The Association organises meetings twice in a year and discusses questions relating to the organisation of scientific historical research, international co-operation in the field, approves five-year plans of research as well as co-ordination plans for conducting conferences on History of Natural Sciences and Engineering.

From 1950 USSR Academy of Sciences joined the International Union of the History and Philosophy of Science, and since then Soviet scientists have been maintaining an active participation in International Congresses devoted to History of Science. The Thirteenth International Congress of History of Science was held in August 1971 in Moscow. Soviet participants took active part in these congresses and as many as 88 scholars attended the XVIth International Congress in History and Philosophy of Science (IUHPS) held at Bucharest in 1981.

It is interesting to note that internationally established scholars have been made the heads of different sectors of History of Science. As a result, the liaison, and mutual respect between the universities and research institutions have greatly improved. The well-known scholars of the universities are requested to deliver lectures at the institutes and *vice versa* for mutual benefit of scholars and students. Another important feature is that in each centre, scholars have been appointed to study nature and development of science of other cultural areas like India, China, Japan, Greece

etc. This helps assess the growth as well as problems of Science, which is international in character.

Indo-Soviet Collaboration

Indian National Science Academy has already entered into bilateral programme with Institute of History of Natural Science and Technology (Moscow), Uzbek Academy of Science (Tashkent) and Tajik Academy of Science (Dushanbe) under Indo-Soviet bilateral programme in History of Science. All these institutes have shown great interest for bilateral programme with India in the field of History of Science and expressed sincere co-operation in the following areas:

1. Exchange of scientists in greater number in the field of History of Science.
2. Organisation of bilateral seminars at regular intervals and publication of proceedings relating to India and Soviet Central Asia.
3. Translation and publication of all materials relating to Soviet Central Asia and India, into English by Indian side and Russian version by Russian side.
4. Preparation of a list of select Arabic and Persian manuscripts containing useful informations of both countries—its studies and publication.
5. Permission for liberal flow of books, journals, microfilms, manuscripts and other materials.
6. Joint Research programme on editing of monographs, research and survey programmes, travel accounts.
7. Translation from English to Russian and *vice versa* for selected works. Russian side has already shown interest for printing into Russian the collected papers of History of Sciences in India. A selected list to be submitted by each side for considerations.
8. Comparative studies of Ulug Beg's observatory at Samarkland with Jai Singh's Observatories at Delhi, Ujjain, Mathura, Benaras and Jaipur.

Remarks

In India there is no Centre for History of Science like that of the Institute of History of Natural Science and Technology (Moscow), and there is no scholar in India who is engaged on a full time basis in the field of History of Science. Unless the History of Science work in India is organised, it would be difficult for the amateur Indian scientist-historians to contribute in an organized manner and complete the works on a time-bound programme. The Soviet side is very much eager to publish multi-volumes in this joint venture and already prepared articles in English for joint two-volume monographs on (*i*) Interaction between Indian and Central Asian Science and Technology in Medieval times, and (*ii*) History of the Cultural Relations between Central Asia and India (Uzbek language).

There are many books and manuscripts which give descriptions about Soviet Central Asia and India. Many rare copies of Arabic and Persian manuscripts of India's interest are also available in Oriental Libraries of USSR. An Indian colony, inhabited by traders from India, particularly from Punjab, existed in Astrakhan region of Russia in the beginning of 19th Century. This is proved by 600 manuscripts found there in Indian and South Asian languages. Most of them are Sanskrit and Pali classics. Hand-written copies of Hindi and Panjabi books, including the *Bhāgvat Gītā* and *Gurugranth Sahib* in addition to the books are in possession of the Institute of Oriental Studies of the Academy of Science, Leningrad. A team of specialists from both countries should be requested to prepare list of important books from their own countries for translation, joint programme and contribution. Soviet scholars showed genuine interest for Indian science and requested to send scientific books, journals, manuscript materials through this exchange programme.

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