

41. COMMISSION DE L'HISTOIRE DE L'ASTRONOMIE

PRESIDENT: M. NEUGEBAUER.

MEMBERS: MM. Armitage, Birkenmajer, Danjon, Dijksterhuis, Dingle, Dittrich, Hubble†, Idelson†, Spencer Jones, Kukarkin, Kulikovsky, Lundmark, Marguérat, Nordenmark, Nørlund, Pannekoek, Pelseneer, Pogo, Sadykov, Seydl, Volta, Zinner.

This is a new Commission, formed at the 1948 Meeting, and its first activities would therefore necessarily have been in any case mainly experimental. Unfortunately they have not even been that. The President, Prof. O. Neugebauer, who was appointed to this office in his absence, has expressed the conviction that 'an international organization in the history of astronomy has no positive function', and, as he puts it, 'my only activity during my term of service consisted in iterated attempts to resign' In these circumstances I agreed, as an interim measure, to act as President for the 1952 Meeting.

It seems clear that the first thing to be done is to consider whether, in fact, the Commission can have a positive function and, if so, to decide as far as possible what it might be. Accordingly, on 2 April 1952, I sent the following letter to the members:

Professor O. Neugebauer unfortunately finds himself unable to continue to act as President of Commission 41, and I have been asked by the Executive Committee to serve as acting President up to the end of the General Assembly at Rome in September 1952. In view of the shortness of time available before the meeting, I have agreed to do so in order that the opportunity for a full discussion of the future of this Commission shall not be lost through the delay which might be caused by the process of choosing a more suitable member for this office. Some doubt has been expressed as to the usefulness of the Commission. It is desirable, therefore, that the matter should be fully considered at Rome, and with this end in view I should be greatly obliged if you would be good enough to let me know your views on the question as early as possible, so that a Report can be drafted to serve as a basis for discussion.

It is clear that the functions of a Commission on the History of Astronomy must have certain special characteristics. It must be relatively detached, since its work inevitably interacts with that of the other Commissions much less than they interact with one another. The subject will necessarily be investigated largely for its own intrinsic interest rather than for its effect in solving current astronomical problems. Further, it is a concern not only of this Union but also of the International Academy for the History of Science, and it may well be felt that it can be left wholly to that Academy, which is very active.

On the other hand, owing to the great stretches of time with which astronomers are concerned on account of the leisureliness of many of their phenomena, astronomy is much more closely bound up with its history than are most sciences. One need only mention such subjects as proper motions, for which Bradley's *Catalogue* of 200 years ago is still a living source of information, calendar reform, records of ancient eclipses, novae and comets, to show that the history of astronomy is by no means wholly separable from current activities. At any moment the trustworthiness of some early observations may become crucial for the testing of a theory on which much future work will depend. It may therefore be reasonably held that the I.A.U., even if its object be regarded solely as that of adding to existing astronomical knowledge, should give some attention to the knowledge of the past.

If this be accepted, it becomes necessary to define the scope of the Commission and to determine the nature of its activities. An obvious suggestion is that a liaison of some kind should be established with the International Academy for the History of Science. It might be the function of Commission 41 to bring to the notice of the International Academy certain investigations which it considers should be made, ancient documents which it considers should be reissued or translated, and so on; while, in its turn, the Academy might refer to the Commission any question on which the opinion of practising astronomers is required. It is conceivable that in these and other ways the Commission might serve a useful purpose as a link between the I.A.U. and the International Academy.

The triennial Reports of the Commission might well conform to the pattern followed by other Commissions, in summarizing the work done in the history of astronomy since the previous Meeting and indicating what researches are in hand and what are desirable in the immediate future. In view of the special nature of this Commission they might have other features, and this question might be discussed at the meeting in Rome.

The foregoing remarks, I need hardly say, are intended merely to open up the question and to serve as a stimulus to members to express their views as freely and on as wide a basis as possible. As I have already said, I should be very grateful if you would be kind enough to send me in good time a statement of your ideas on the matter, to enable me to prepare a useful Report for circulation before the meeting.

The replies have been fewer than I hoped. It may be that others will yet be received, in which case their substance will be read at the meeting in Rome. The following is a summary of the views that have been expressed.

Neugebauer's remarks should be given verbatim. They are as follows:

The reason for this purely negative attitude consists in my conviction that an international organization in the history of astronomy has no positive function. Negatively new plans for handbooks, digests, bibliographies, conferences, symposia, etc. will effectively contribute to diverting time and efforts from scholarship to compilation.

Active help in astronomical problems like novae, secular acceleration, occultations and eclipses, etc. can only be given in very specific cases by competent specialists. And in the great majority of cases the historian will be unable to respond, simply because of lack of adequately published material. If one out of a thousand Arabic, or Latin, or Sanskrit, astronomical texts is published we may call ourselves lucky. What is the sense of a Commission when there are no ways and means to get at the sources?

And what is worse: where are the means of teaching young men the necessary languages, Latin, Greek, Sanskrit, Arabic, Persian—to mention only the obvious? Where is the money to make the texts available in which historical observations, and theories are recorded? Who will educate the scholars who are capable of analysing the sources when properly edited?

The few people who actively work in the history of astronomy know well enough that their lifetime is only a short span for the task ahead. No Commission is needed to tell them what to do. Delambre, Schiaparelli, Tannery, Dreyer have made their splendid contributions as responsible scholars without committees and conferences. Let us put all money which is spent for travel and reports into a fund for the education of young scholars and we shall soon have a new era not only of historical research but of scholarship as a whole.

My arguments apply equally well to the International Academy for the History of Science. I would also not hesitate to extend them to all the U.N.E.S.C.O. projects which now absorb so much energy and money. I would like, however, to avoid one misunderstanding. I never suggested that 'everyone should work independently'. I think I have myself a fairly good record of co-operation, having published joint works with mathematicians, astronomers, Sanskritists, Greek scholars, Arabists, Egyptologists, and Assyriologists. All I consider detrimental is the planning of work by outsiders who have great ideas instead of getting their own hands dirty and letting the problems develop in an organic fashion by themselves.

On this it may be commented that while everyone will probably agree that the Commission could not possibly fulfil all the needs of the historian of astronomy, it does not follow that it could not fulfil some of them or that it could not serve in the reverse direction as a means of making more effective the application of the knowledge that already exists to the solution of current problems.

All the other replies have been favourable to the continuance of the Commission.

Birkenmajer points out that the Commission, being solely concerned with the history of astronomy, would be better situated than the comprehensive International Academy for the History of Science both for determining the primary needs of the subject and for financing them. As examples of projects that might be sponsored he mentions an English or French translation of the *de Revolutionibus* of Copernicus, with notes making clear

the thought of Copernicus to present-day astronomers (no trustworthy translation of this work into a modern language exists at present), and an edition of the correspondence of Hevelius based on the MSS. in the Bibliothèque Nationale de Paris.

Dittrich writes similarly, with the additional recommendation that translations of classics such as the *Almagest*, *de Revolutionibus*, Newton's *Principia*, etc., should include a translation into present-day mathematical notation.

Spencer Jones thinks that a liaison with the International Academy for the History of Science would be desirable and would be facilitated if the President of the Commission were also a member of the International Academy.

As further examples of the dependence of current astronomical work on the history of astronomy he mentions chronology and the bearing of ancient eclipse observations on the frequent small erratic changes to which the rotation of the Earth seems to be subject. Historical knowledge in this field might considerably modify our conclusions about the secular acceleration of the Moon, the effects of tidal friction, etc. He suggests also that the Commission might undertake the summarizing of work done in the history of astronomy, some of which, being published in journals not normally consulted by astronomers, might otherwise escape notice. It could also keep astronomers informed of researches in progress, and so prevent unnecessary duplication. He considers it inadvisable to define the scope of the Commission too strictly at this stage; it would be best to start with the widest possible field of activity, and gradually narrow the scope as the result of experience.

Seydl favours a liaison with the International Academy for the History of Science, without further suggestion as to its character.

It is evident that the chief problem to be settled at Rome is that of the future, if any, of the Commission. It will therefore suffice merely to mention that two reports have been received on work done in this field during recent years—from the Soviet Union and Japan, respectively. If the Commission is to be continued and is to include a review of current work in the history of astronomy among its functions, this can be included in the next Report.

July 1952

HERBERT DINGLE

Report of meeting

ACTING PRESIDENT: Prof. H. DINGLE.

ACTING SECRETARY: G. J. WHITROW.

A letter was read from Prof. Neugebauer further elucidating his reasons for regarding the Commission as superfluous. Prof. Pannekoek wrote to the same effect, but Prof. Lundmark sent a letter strongly expressing the hope that the Commission would continue.

The acting President pointed out that the objections to the Commission were in fact objections to the Union, which seemed to be regarded as in some way an alternative to the work of individual astronomers. This seemed to be a misapprehension. On the other hand, this Commission was peculiar in that its field of study was also part of the field of study of other international bodies, the International Union for the History of Science and the International Academy for the History of Science. If the Commission was to continue it was therefore desirable to see what particular work remained for it to do which was not otherwise provided for. For example, the fact that current astronomical work was tending more and more to require historical references (e.g. the identification of 'radio stars' with early novae) might make the Commission a useful medium for bringing to the attention of historians of astronomy such problems as were most immediately important.

Prof. Stratton pointed out that the Commission was originally formed at the request of I.C.S.U. and that other international unions had similar commissions.

During the discussion several present spoke in favour of the existence of the Commission and it was decided to recommend that it be continued. It was not considered

desirable at the present time to define its functions very rigorously. A report should, however, be presented at the next meeting on the work which had been done in the meantime, and the needs of the subject could then be more fully reviewed.

Attention was called to the following reports from Japan and the U.S.S.R.:

JAPAN

In the past twenty or thirty years, researches into the history of Chinese astronomy have been promoted by the late Prof. S. Shinjo, T. Iijima, M. Hashimoto, C. Noda and others. Their works are summarized in the following books:

S. Shinjo, *Researches on the History of Chinese Astronomy* (1928).

T. Iijima, *Studies on the Origin of Chinese Astronomy* (1930).

M. Hashimoto, *Researches on the Ancient History of Chinese Astronomy* (1943).

C. Noda, *Essays on the History of Chinese Astronomy* (1943).

These works have contributed to the general researches into Chinese classics for the thorough chronological treatment of dates and interpretation of astronomical descriptions therein. But the domain of these researches is limited to Chinese astronomy of ancient times, before the Christian era. Recently K. Yabuuti has studied the development of the history of Chinese astronomy before and after the Christian era. A part of his researches has been published in 1944 as *Researches on the History of Chinese Astronomy in the Sui-T'ang Dynasties (ranging from the sixth century to the end of the tenth century)*, with a brief account of Chinese astronomy since the remotest time of Chinese history up to the Sui Dynasty. He has also studied the development of astronomy after the T'ang Dynasty and has lately published a short article 'The Arabian astronomy introduced in China' (1950) in which the relations between Chinese and Arabian astronomy in the thirteenth and fourteenth centuries are treated. In this connexion we must refer to an article by K. Tasaka, 'Introduction of European Astronomy and Mohammedan calendars' (1947). K. Yabuuti has published a revised edition of his *Chinese Astronomy* (1949). This book contains a short summary of the important problems of Chinese astronomy. K. Yabuuti has also written an article on 'Ancient Chinese time keepers' (1951).

With regard to Japanese astronomy, the unpublished work, 'The Calendar of Nihon Syoki' by the late Kiyohiko Ogawa, is very valuable. It solves many important problems of ancient Japanese chronology. As a part of the compilation of the history of Japanese sciences before the Meiji era planned by the Academy of Japan, the history of Japanese astronomy has been studied for nearly ten years. These researches were at first made by the late Prof. K. Hirayama and after his death were continued by Prof. Y. Hagihara. The collaborators were S. Kanda, C. Noda, T. Akioka and K. Yabuuti. The work has nearly been completed, but has not yet been published.

K. Suzuki made checks of records of 567 solar eclipses given in ancient Japanese chronicles from A.D. 628 to 1600 on the basis of Oppolzer's elements, and found a few of them to be reliable (in Japanese, *Tenmon-Yoho*, Vol. 6, no. 4).

For the outlook of Japanese astronomy after the Meiji era, since 1866, the following two articles must also be noticed:

F. Shimamura, 'Annual Table of Astronomy of Modern Japan' (1950).

S. Imoto, 'Bibliography of Astronomy in Meiji Era' (1949).

So far, the work of Japanese scholars on the history of Chinese astronomy has reached a comparatively high level, but being written in Japanese is almost unknown to European scholars. It is desirable to translate these investigations into a European language.

SHORT REPORT FOR COMMISSION NO. 41 CONCERNING WORK
CARRIED OUT IN THE U.S.S.R.

For the past years numerous studies were carried out related to the progress of astronomy in the Soviet Union and to the life and activity of a number of astronomers of various peoples of the country. These studies refer to a wide period of time, beginning with the nineteenth century and continuing up to the present time. The development of astronomical views and the activity of individual scientists were regarded in these studies in close connexion with the general economic and social conditions of each epoch.

Many studies are based upon the new historical and archaeological data discovered during the last few years by Soviet historians and archaeologists. These studies caused an essential change in our views concerning the role played in Middle Asia from the tenth to the fifteenth centuries by the so-called 'Arabic culture' and lead us to a far better understanding of the history of the national cultures of the peoples of the Caucasus and the Near East. The cultures of these peoples can by no means be considered as borrowed from the Arabs, but are quite independent achievements of great significance.

Among studies connected with the scientists of the Middle Ages the following should be mentioned:

The work of the Armenian scientist A. G. Abramyan concerning Ananiya Shirakatzi, the Armenian astronomer of the seventh century (doctorate dissertation, Erevan, 1944), studies of the Tadjik scientist H. U. Sadikov on the chorezmer Abu-Raihan-Biruni (*A. J. U.S.S.R.* 27, no. 2, p. 73, 1950; symposium *Biruni*, published by Acad. Sci. U.S.S.R. pp. 74-87, 1950); the work of A. P. Jushkevich concerning the Tadjik scientist Omar Haiyam and his algebra (*Publ. Inst. History of Nat. Sci.* Vol. II, 1948); an article by the Azerbaijan G. D. Mamedbeyli about Nasr Eddin Tusi, the Azerbaijan scientist (from the 'History of the Maraguine Observatory', *Publ. of the Conference on the History of Natural Science*, 24-26 Dec. 1946, published by Acad. Sci. U.S.S.R. 1948); a large monograph by T. N. Kara-Niyasov, the Uzbek scientist, member of the Academy of Sciences of the Uzbek S.S.R., about Ulugh-Beg, the Uzbek astronomer, and his astronomical school (*Astronomical School of Ulugh-Beg*, published by Acad. Sci. U.S.S.R. 1950), R. J. Dzjalyalov, astronomer of the Tashkent astronomical observatory, published an article 'The sextant as the chief instrument of Ulugh-Beg's Observatory' (*A. J. U.S.S.R.* 24, no. 4, 1947). M. E. Masson's monograph (1941) was devoted to a description of Ulugh-Beg's Observatory. N. J. Leonov published in 1949 the monograph *Ulugh-Beg, the great astronomer of the fifteenth century* (2nd ed. 1950).

The history of astronomy in Russia in the eighteenth century is described shortly in an article by V. G. Fesenkov, member of the Academy of Sciences of U.S.S.R. (*Publ. Inst. Hist. Nat. Sci.* no. 11, 1948), and the history of astronomy in Russia in the nineteenth century in an article by Prof. B. A. Vorontsov-Velyaminov (*ibid.*).

A large monograph by Prof. S. N. Blazhko, devoted to the history of astronomy in the Moscow University, was published in 1941 (*Scientific Papers of the Moscow Univ.* no. 91). An article by Prof. S. K. Vsessviatsky was devoted to the 100th anniversary of the Kiev University Observatory (*Publ. Kiev Univ. Obs.* Vol. 1). In Vol. III of the collection, *Variable Stars*, by various authors, Prof. B. V. Kukarkin gave a general historical outline of the development of variable star study (published by the State Tech. Edit. 1947).

A treatise on the astronomical works of M. V. Lomonosov, the great Russian scientist of the eighteenth century, was published by P. G. Kulikovsky in 1950 (monograph). The history of the Pulkovo Observatory for the 100 years of its existence was the subject of a special symposium (published by Acad. Sci. U.S.S.R. 1945). In 1948 appeared the symposium *Astronomy in the U.S.S.R. during 30 years* (State Tech. Edit. 1948).

A historical study of the astronomical activity of J. V. Bruss, Peter the Great's fellow-champion, was published by V. L. Chenakal (*A. J. U.S.S.R.* 28, no. 1, 1951).

Prof. N. I. Idelson published his study *Lobachevsky—astronomer* (symposium, *Questions of the History of Native Science*, State Technical Edition, 1949).

The ancient Armenian calendar was the object of a special study of L. L. Semenov (*Conference on the History of Natural Science*, 24–26 Dec. 1946, published by Acad. Sci. U.S.S.R. 1948).

Prof. B. A. Vorontsov-Velyaminov produced an article concerning the studies of W. Struve on stellar statistics (*Conference on the History of Natural Science*, 24–26 Dec. 1946, published by Acad. Sci. U.S.S.R. 1948).

Prof. D. J. Martynov studied the work of M. A. Kovalsky, who deduced as early as in 1860 formulae of galactic rotation and applied to the analysis of proper motions of stars the method of construction of figures, which later received the name of Kapteyn figures.

Books and special studies devoted to Bruno, Copernicus, Galilei, and Newton, containing some of their works in Russian translation, were also published in the U.S.S.R.

Nikolai Copernicus, devoted to the 400th anniversary of the death of Copernicus (published by Acad. Sci. U.S.S.R. 1947), contains, in addition to the new translation of the first ten chapters of Book I of *De Revolutionibus*, two articles by Prof. N. I. Idelson: 'Life and work of Copernicus' and 'Studies on the history of planetary theories'; V. A. Fock, member of the Academy of Sciences of the U.S.S.R., presented a paper on 'The systems of Copernicus and Ptolemy from the point of view of the general theory of relativity', and some others.

In *Galileo Galilei* (published by Acad. Sci. U.S.S.R. 1943), devoted to the 300th anniversary of the death of the great scientist, among others is an article by Prof. N. I. Idelson, 'Galileo in the history of astronomy', and N. I. Idelson's translation of the *Messages to Frančesko Ingoli*. In *Galileo Galilei* also S. I. Vavilov published an extremely interesting paper, 'Galileo in the history of optics'

S. I. Vavilov, member and ex-President of the Academy of Sciences of the U.S.S.R., published a monograph devoted to Isaac Newton, in connexion with the 300th anniversary of his birth (Acad. Sci. U.S.S.R. 1943, 2nd ed. 1945). In 1943 was published the speech of A. N. Krylov, member of the Academy, *Newton and his Significance in World Science*. A large symposium by various authors devoted to Newton was published by the Academy of Sciences of the U.S.S.R. in 1943. The symposium, issued in spite of all the difficulties of war-time, contains the following articles on astronomy: Prof. J. A. Khvostikov, 'Newton and the development of the doctrine concerning the refraction of light in the Earth's atmosphere'; Prof. N. I. Idelson, 'Law of universal gravity and the theory of the Earth's motion'; Prof. L. N. Sretensky, 'Newtonian theory of the tides and the figure of the Earth'; Prof. A. D. Dubyago, 'Comets and their significance in the general system of Newton's *Principia*'. Works of Newton, translated into Russian, were published by the Academy of Sciences of the U.S.S.R. in separate issues, as *Lectures in Optics* (transl. by S. I. Vavilov and supplemented by his comments, published by Acad. Sci. U.S.S.R. 1946).

In connexion with the history of geodesy should be mentioned a translation of A. Clairaut's book, *Theory of the Figure of the Earth, based upon the Principles of Hydrostatics*. This book was published in 1947 in the series of 'Classics of Science', under the editorship of Prof. N. I. Idelson, with his detailed comments.

Among publications of old documents should be mentioned the *Letters of P. S. Laplace, C. F. Gauss and F. V. Bessel to I. Schubert, member of the Petersburg Academy of Sciences*, edited by Prof. N. I. Idelson and with an introduction by him, published in the symposium *Scientific Inheritance*, Vol. 1 (1948).

Besides the above are published in Russian the *Dialogues* by Giordano Bruno with a commentary by Prof. M. A. Dinnik (State Political Edition, 1949), *Dialogue Concerning two Principal World Systems* by Galileo Galilei and the biography of Copernicus by G. Revsine (Young Guards Edition, 1949).

Prof. N. I. IDELSON
Prof. B. V. KUKARKIN
Dr P. G. KULIKOVSKY

SUPPLEMENT TO THE REPORT OF COMMISSION 41 CONCERNING THE INVESTIGATIONS INTO
THE HISTORY OF ASTRONOMY PUBLISHED IN THE U.S.S.R. DURING 1951

G. D. Mamedbeili published an investigation devoted to the activity of the outstanding Azerbaijan astronomer Nasr Eddin Tusi (*Bull. Acad. Sci. Azerbaijan S.S.R.* no. 9, 1951).

V. L. Chenakal's book, *Outlines of the History of Russian Astronomy* (edited by the Acad. Sci. U.S.S.R. 1951), contains interesting information about the development of observational astronomy in Russia during the seventeenth and early eighteenth centuries, based on material from archives and other sources.

A historical investigation of the activity of the masters of Russian astronomical instrument-making of the mid-eighteenth century, N. G. Chizjov and A. I. Kolotoshin, has been published by V. L. Chenakal (*A.J. U.S.S.R.* 28, no. 3, 1951; 29, no. 2, 1952).

A separate investigation has been undertaken by V. L. Chenakal concerning the equipment of the astronomical observatory of the Petersburg Academy of Sciences in the time of Lomonosov (*A.J. U.S.S.R.* 28, no. 5, 1951).

A series of investigations connected with the history of the Tashkent astronomical observatory has been published by V. P. Shcheglov. In particular, he claims that the idea of the construction and application of the small vertical circle for geodetic purposes should be ascribed to D. D. Gedeonov (*A.J. U.S.S.R.* 28, no. 4, 1951; 28, no. 6, 1951).

The Academy of Sciences of the U.S.S.R. has edited in 1951 in the series 'Classics of Science' the translation of a number of works by Christian Huygens (general editor, Prof. K. K. Baumgart).

Prof. B. V. KUKARKIN

The acting President also read the following note from Prof. Lindblad on recent excavations of Tycho Brahe's observatories:

Report concerning Tycho Brahe's Observatory, Stjärneborg, on Ven

During more than fifty years the question how to protect the remnants of Tycho Brahe's observatories on the island of Ven has caused much discussion among astronomers and archaeologists in Denmark and Sweden, but owing to the lack of the necessary funds no definitive steps have been taken until quite recently. The first modern excavations were made in 1901 in connexion with the 300th anniversary of the death of Tycho Brahe. On this occasion it was found that of the castle of Uraniborg only the foundation walls, the deepest parts of the basement and some portions of the ramparts were preserved. The ground around the former castle was, however, arranged in its present form. The ruins of Stjärneborg were also excavated and they were found in better condition owing to the fact that this observatory was mainly subterranean, consisting of a number of crypts for the instruments. After the excavations were finished the ruins were covered by sand for the purpose of protection. Several minor excavations have been made on the island since then and interesting finds have been made, for instance the remains of Tycho's paper mill.

The late Prof. Elis Strömberg, Director of the Observatory of Copenhagen, was very much interested in the problem of excavating and protecting Stjärneborg, but the second world war prevented any plans being carried out.

On the initiative of Prof. N. V. E. Nordenmark the Swedish National Committee for Astronomy took up the question in 1950. A new design for the reconstruction of Stjärneborg had been drawn up by the architect Mr H. Carlheim-Gyllensköld. The National Committee reported to the Swedish Academy of Science with a definite proposition in the matter. The necessary funds were given by the Tycho Brahe Fund of the University of Lund, the Swedish Astronomical Society, the Swedish Academy of Sciences, the Danish Carlsberg and Rask-Örsted Funds in Copenhagen, the Swedish Academy of Literature, History and Antiquities, as well as from a number of private donors. The reconstruction was carried out under the auspices of the Director-General of the Office of National Antiquities.

The building constructed above the excavated crypts has been made in the form of a slightly rounded concrete roof in the level of the surrounding ground. On this roof small towers with spherical or conical domes have been built above the crypts, resembling the original domes of Stjärneborg. The domes can be opened, allowing visitors to examine the crypts from above. Visitors may also descend into the underground part of the building.

The reconstruction is intended to give the visitor a clear conception of the appearance and purpose of the original observatory. Some of the crypts are preserved in a remarkably good shape and it is hoped that later on replicas of Tycho's instruments may be placed there.

BERTIL LINDBLAD