

41. HISTORY OF ASTRONOMY (HISTOIRE DE L'ASTRONOMIE)

PRESIDENT: O. Gingerich.

VICE-PRESIDENT: J. Dobrzycki.

ORGANIZING COMMITTEE: W. Hartner, Z. Horský, M. Hoskin, P. Slavenas, O. Pedersen (representative of the International Union for the History and Philosophy of Science).

1. INTRODUCTION

The 1973 'Year of Copernicus' provided an unprecedented opportunity for the recognition of the history of astronomy as a serious discipline. A historical symposium was among the six arranged in conjunction with the IAU Extraordinary General Assembly in Warsaw, and the commission president was invited to give a major address on Copernicus at the inaugural session. Throughout the world astronomers joined with other scientists, scholars, and philosophers to take stock of the scientific enterprise in the light of its historical origins. Representing the views of many distinguished spokesmen was Janusz Groszkowski, past president of the Polish Academy of Sciences; at the Fifth International Symposium of the Smithsonian Institution he said 'Mikolaj Kopernik is and will forever remain a symbol of free and independent scientific mind, and of the dedication to truth. He searched for it, and he served it. This should be an eminent characteristic of every researcher. Without it there is no progress in science.'

In introducing the resulting symposium volume, I wrote, 'From his "remote corner of the world," Nicolaus Copernicus set into motion not only the Earth, but the entire spirit of inquiry that has so richly increased our understanding of the universe. But the ultimate reason for the anniversary celebration – and indeed its challenge – is a rededication to preserve the fragile freedom of inquiry and the resources that make inquiry possible.'

Although many scientists and scholars who are not ordinarily historians of Copernicus were enlisted into service for the quinquecentennial so that the Copernican anniversary represented a major effort for this discipline, historians of science pursued many other activities during the triennium just past. Of particular note was the XIVth Congress of the International Union for the History and Philosophy of Science (IUHPS) held in Tokyo and Kyoto in August, 1974, and the Greenwich Tercentenary Symposium cosponsored by the IAU and IUHPS in July, 1975.

This report of Commission 41 does not aspire to present a comprehensive review of the many recent symposia or conferences in this field, much less the individual publications and activities of numerous researchers. Nevertheless, I wish to single out one achievement for particular mention: the publication in 1975 in three volumes of *A History of Ancient Mathematical Astronomy* by O. Neugebauer, which gives in penetrating detail some of the principal astronomical results of a lifetime of investigation in the exact sciences of antiquity.

2. MEMBERSHIP

A characteristic feature of Commission 41 is that many eminent scholars, active workers in the history of astronomy but not astronomers, serve as consulting members although they are not regular members of the IAU. At present the Commission is composed of 65 regular members and 35 consulting members. If Commission 41 is to remain both professional and representative, the IAU must continue on occasion to admit into full membership experts in the history of astronomy who are not practicing astronomers. In 1973 the Commission co-opted into full IAU membership Dr Eric Forbes (U.K.) and Prof. O. Pedersen (Denmark).

3. COMMISSION PUBLICATIONS

The commission president has continued the publication of the *Information Circular*, a newsletter founded by P. G. Kulikovskiy in 1962 and distributed free to all members and consulting members of Commission 41. Numbers 23 (December 1973), 24 (December 1974), and 25 (September 1975) have appeared since the Fifteenth General Assembly in Brighton, and 26 is planned for the spring of 1976. The Circulars contain names and addresses of our members as well as information on symposia and anniversary celebrations.

Issue 13 of the *Bibliography of Books and Papers Published on the History of Astronomy* for 1972, and issue 14 for 1973 appeared in 1973 and 1975 respectively, and issue 15 for 1974 was in press at the end of 1975. These were as usual prepared by N. B. Lavrova (Scientific Library of the Moscow University) and edited by Z. K. Sokolovskaya (Institute for the History of Science and Technology, Moscow) with the help of L. M. Vasil'eva (Pulkovo Observatory).

The proposed *General History of Astronomy*, (GHA) being undertaken jointly with IUHPS under the general editorship of M. A. Hoskin, received a setback resulting from the high rate of inflation and uncertain conditions in the publishing industry. MIT Press (Cambridge, Mass.), which had agreed to underwrite many of the editorial expenses, withdrew its offer, temporarily leaving the GHA without viable financial support.

By the end of 1975 active negotiations were begun by Dr Hoskin with another publisher with a good prospect of success. Meanwhile, in December 1974 P. G. Kulikovskiy visited Hoskin in Cambridge especially to discuss the arrangement of Volume 3 of which they are joint editors, and O. Gingerich tentatively agreed to replace G. Whitrow as editor of Volume 4.

4. ASTRO-ARCHEOLOGY

Proceedings of the Royal Society-British Academy symposium of December, 1972, have been published in the *Philosophical Transactions A* 276, no. 1257 and as the volume *The Place of Astronomy in the Ancient World*. A continuing series of articles on stone monuments of Britain and Brittany by A. Thom and his associates have appeared in the *Journal for the History of Astronomy*.

The sessions on 'Archaeoastronomy in Pre-Columbian America' held in Mexico City at the American Association for the Advancement of Science in June, 1973, proved so successful that a second conference on this topic took place at Colgate University in Hamilton, New York, on 23–26 September, 1975. Papers included discussions of Mayan and Peruvian astronomy as well as North American stone circles and pictographs.

5. AL-BIRUNI MILLENNARY

The thousandth anniversary of Abu Raihan Muhammad ibn Ahmad al-Biruni (973–1048) was celebrated with an International Congress in Pakistan from 26 November through 8 December, 1973, organized by Hakim Mohammed Said under the auspices of the Hamdard National Foundation. Delegates from 16 other countries participated, and 75 scholarly papers were presented at the congress. A summary of the program was printed in *Hamdard*, 17, no. 7–12, 1974. The *UNESCO Courier* devoted its June, 1974, issue to al-Biruni.

6. COPERNICAN QUINQUECENTENNIAL

The IAU commemorated the birth of Copernicus with an invited lecture in Warsaw on 'The Astronomy and Cosmology of Copernicus' (published in *Highlights in Astronomy 1973*). In this lecture the commission president announced the discovery, in the Vatican Library, of Tycho Brahe's annotated copy of Copernicus' *De revolutionibus*, a volume containing what are

probably the most important Tycho cosmological manuscripts in existence.

The IAU cosponsored (with the IUHPS and the Academie Internationale d'Histoire des Sciences) a symposium on 'The Astronomy of Copernicus and Its Background' at Toruń (Copernicus' birthplace) on 7–8 September, 1973. Review papers were given by W. Hartner (G.F.R.), O. Pedersen (Denmark), and E. Rosen (U.S.A.); these and other contributions have been printed in the *Studia Copernicana* series of the Polish Academy of Science. This symposium was part of the longer 'Colloquia Copernicana,' which included a tour of Olstyn, Lidzbark, and Frombork in northern Poland as well as sessions on the reception of the heliocentric theory.

Innumerable symposia, lectures, and exhibitions in honor of Copernicus took place during 1973. Some of the most significant were mentioned in our Commission report for 1973. A detailed listing has been proposed for a future volume in the *Studia Copernicana* series.

A major result of the Copernican anniversary has been the preparation of the three-volume *Nicholas Copernicus Complete Works* by the Polish Academy of Sciences under the editorship of Pawel Czartoryski. The first volume, containing a facsimile of the original holograph manuscript, has already appeared, and publication of the remaining volumes is imminent. Volume 2 will contain *De revolutionibus* itself in three different versions, Latin, Polish, and English; the latter will feature a new translation by E. Rosen. Volume 3 will contain the letters and a new recension of the *Commentariolus* by J. Dobrzycki based on the newly found manuscript in Aberdeen, Scotland. In the past triennium new Copernican translations have appeared in French, Slovak, and other languages.

Despite the concentrated research on Copernicus, no 'standard' biography exists, and in fact, the paucity of information about his life may render such a project unattainable. But in the absence of a full biography, a notable sourcebook has now become available: the *Regesta Copernicana* by Marian Biskup, which systematically lists every known contemporary document concerning Copernicus. It is published in Polish as *Studia Copernicana* VII and in English as VIII. Another important documentary source for Copernican studies has recently become more widely accessible through an English translation (prepared under the supervision of J. Dobrzycki and O. Gingerich) of L. A. Birkenmajer's *Mikolaj Kopernik*, originally published in Polish in 1900. It is available as LD00044 for \$22 from Xerox University Microfilms, attention Sharon Horton, 300 North Zeeb Road, Ann Arbor, Michigan 48106. The oldest known biography of Copernicus, written by Bernardo Baldi in 1588, has been rediscovered and published in *Studia Copernicana* IX.

Important insights in our understanding of Copernicus' work made over the past three years include N. Swerdlow's demonstration that much of *De revolutionibus* was written comparatively late (in the 1530s), and K. Moesgaard's argument that in many essential details it was unfinished. Swerdlow has also given evidence that Copernicus arrived at his heliocentric cosmology via a Tychoic-type geocentric theory, which he rejected because of a continuing belief in solid celestial spheres. Several studies, especially O. Pedersen's on the 'corpus astronomicum,' cast new light on the fifteenth-century rediscovery of Ptolemy and the concurrent philosophical problems of reconciling the theory of the equant with the Aristotelian spheres. The quinquacentennial year brought a wider awareness that the thirteenth-century Damascene astronomer Ibn ash-Shatir had anticipated several of the specific planetary mechanisms that figured large in Copernicus' elimination of the Ptolemaic equant.

A census of locations of *De revolutionibus*, which now includes about 225 copies of the first edition (1543) and a like number of the second (1566), coupled with a personal survey of their manuscript annotations by the commission president, has revealed a family of common glosses deriving primarily from Erasmus Reinhold in Wittenberg. Related studies by R. Westman have shown how thoroughly the Osianderian view (that the heliocentric cosmology was essentially only a hypothesis) permeated university teaching in the sixteenth century, but these studies have also delineated nuances of interpretation between different Lutheran astronomers.

By now most of the 1973 Copernican symposium volumes have appeared in print, and are listed in the Bibliography in Section 9.

7. GREENWICH TRICENTENARY

The Fourth Joint IAU/IUHPS Symposium on the History of Astronomy took place in Greenwich, England, 14–18 July, 1975, to commemorate the 300th anniversary of the Royal Observatory. D. H. Waters (U.K.) served as president of the organizing committee and A. J. Meadows (U.K.) was designated as IAU representative. Other members of the organizing committee were I. B. Cohen (U.S.A.), F. Greenaway (U.K., IUHPS representative), H. D. Howse (U.K.), P. Laurie (U.K.), O. Pedersen (Denmark), and D. V. Proctor (U.K., secretary).

Participants from nearly 20 nations gathered at the National Maritime Museum and considered not only the history of the Greenwich Observatory but of other observatories, navigation, timekeeping, and instruments. A closing reception at the Royal Society in London emphasized the historical links between the two institutions. A brief description of the celebration is found in *Sky and Telescope* 50, pp. 217–218, October, 1975, and the symposium papers will be printed in a forthcoming issue of *Vistas in Astronomy*.

8. JOURNALS AND SERIES

In 1976 the *Journal for the History of Astronomy* begins its seventh volume under the editorship of M. A. Hoskin. The journal, issued thrice yearly, has treated a wide variety of topics ranging from Kepler's analysis of Mars to timekeeping in ancient Armenia, and from the planetary theory of Viète to van Maanen's measurements of proper motions in spiral nebulae. The *JHA* continues to be the primary journal in our field, and members of the Commission and their institutions are urged to help ensure its viability by subscribing to it.

Other important articles and reviews in our field are scattered in many other journals such as *Centaurus*, *Isis*, and *History of Science*. The recently revived *Archives Internationales d'Histoire des Sciences* has carried several particularly significant papers.

The *Studia Copernicana* series issued by the Institute of History of Science and Technology of the Polish Academy of Science contains both monographs and collections of great interest for the history of Renaissance astronomy. The current titles are listed in the next section.

By the end of 1975 twelve volumes of the *Dictionary of Scientific Biography* (edited by C. C. Gillispie) had appeared. Major astronomical articles of the first seven volumes were mentioned in the previous report; volumes 8–12 include Lockyer (H. Dingle), Mästlin (E. Rosen), E. A. Milne (G. J. Whitrow), Newcomb (B. G. Marsden), Newton (I. B. Cohen), Ptolemy (G. J. Toomer), Qutb al-Din (S. H. Nasr), Regiomontanus (E. Rosen), Reinhold (O. Gingerich), Rheticus (E. Rosen), H. N. Russell (B. C. Cogan), Sacrobosco (J. F. Daly), Schiaparelli (G. Abetti), Schwarzschild (S. H. Dieke), Shapley (O. Gingerich), Shayn (P. G. Kulikovskiy), and Ibn al-Shatir (D. A. King).

9. NEW BOOKS IN THE HISTORY OF ASTRONOMY

The following compilation of approximately 100 titles is based primarily on the volumes sent for review to the *Journal for the History of Astronomy* and on the *Bibliography of Books and Papers Published on the History of Astronomy* for 1972 and 1973. I wish to thank Barbara Welther for her considerable help in assembling this list.

Of particular interest among these titles is the largest and most expensive book, the epoch-making 1034-page volume 18 of *Vistas in Astronomy*, which contains, *inter alia*, the papers of the Second Joint IAU/IUHPS Symposium, the 1971 Leningrad conference on Kepler. Arthur Beer and Peter Beer have gathered over 100 articles into this collection, and which papers were presented at Leningrad can be deciphered from the key on page 1016.

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Avant, Avec, Après Copernic: La Représentation de l'Univers et ses Conséquences Epistemologiques: 1975, Libr. Scient. Techn. Albert Blanchard, Paris.

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- Berendzen, R. (ed.): 1972, *Education in and History of Modern Astronomy*, *Annals New York Acad. Sci.*, 198.
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- Birkenmajer, A.: 1972, *Études d'histoire des sciences en Pologne*, (*Studia Copernicana IV*), Ossolineum, Wrocław.
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- Centkowski, J.: 1973, *Fromborski Samotnik*, Lud. Spoldz. Wyd., Warsaw.
- Cohen, I. B. (ed.): 1975, *Isaac Newton's Theory of the Moon's Motion (1702)*, Science History Publications, New York.
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O. GINGERICH
President of the Commission