

In Memoriam *Paul Kunitzsch*

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Paul Kunitzsch died peacefully in a rehabilitation centre in Munich on May 7, 2020. He had broken his hip on 31 January, had survived several operations and pneumonia during his rehabilitation, but was never able to return to his home again. Although he was not directly affected by the coronavirus, during the last two months of his life he was not allowed to receive any visitors except for one near relative. Kunitzsch was the world specialist in particular on two overlapping areas in the history of Islamic and medieval European astronomy, namely on the one hand the tradition of Ptolemy's *Almagest* and on the other all aspects of stars and constellations in the Arabic and medieval Latin traditions, especially the etymology of star names, star tables and catalogues, and stars depicted on astrolabes.

Paul Kunitzsch was born on 14 July 1930 in Neu-Krüssow in the district Ost-Prignitz in the German province of Brandenburg, 100 km northwest of Berlin. In 1937 he moved with his parents and younger brother to Spandau, the westernmost borough of Berlin. From 1944 onwards he was a student at the humanistic Kant-Gymnasium. Due to the war, this school was relocated to a village near Lodz (Poland), 500 km east of Berlin. With the Soviet army marching on to the German capital, Kunitzsch made his way back to Berlin on his own in early 1945.

Thanks to practical lessons in stellar astronomy and a basic course in Hebrew offered at the Gymnasium, Kunitzsch developed the two main interests that would shape his more than 60-year long career as a scholar, namely star names and Semitic languages. After having received his diploma in 1950, he enrolled at Munich University in 1951. From 1952 onwards, he continued his studies at the Freie Universität in Berlin, where he graduated in classical philology in 1957. But already one year earlier he had received his Promotion (first doctorate, PhD) in Oriental studies for his first major work on Arabic star names in Europe, a topic of his own choosing for which the well-known Munich Orientalist Anton Spitaler was the ex-

ternal adviser. Spitaler would continue to actively support Kunitzsch during much of his career.

In the 1950s and 1960s it was practically impossible to find research positions in the history of Islamic science. In 1956/57 Kunitzsch taught Arabic at Göttingen University. From 1957 to 1960 he taught German at the Goethe Institute in Cairo. During this period, he travelled extensively in the Near East and prepared a catalogue of the microfilms that the Institute of Arabic Manuscripts in Cairo had collected of astronomical manuscripts from around the Arabic world, including manuscripts that have meanwhile become inaccessible due to wars or sales of private collections. From 1960 to 1963 Kunitzsch continued to work for the Goethe Institute in Germany and from 1963 to 1968 he was a consultant for the Arabic world at the Deutsche Welle in Cologne.

A fellowship of the German Research Foundation (DFG) allowed Kunitzsch to prepare a Habilitationsschrift (second doctoral thesis) on the tradition of Ptolemy's *Almagest* and its star catalogue in Arabic and Latin. He received his Habilitation (which qualifies for a professorship) in June 1971 from the Faculty of Philosophy of the Ludwig Maximilians University in Munich. In 1975 he moved to Munich to become a lecturer for Classical Arabic studies. In 1977 he became an extraordinary professor, and in 1978 a full professor. He would continue to teach classes on Arabic language, literature and history and occasionally on the history of Arabic science until his retirement in 1995.

Kunitzsch became a corresponding member of the Académie Internationale d'Histoire des Sciences in 1967 and an ordinary member in 1986. He was an ordinary member of the Bavarian Academy of Sciences and Humanities since 1985 and a corresponding member of the Academy of the Arabic Language in Cairo since 1992. In 1997 he received the medal of honour of the Jordanian Astronomical Society, and in 2014 the Šūfī medal of the Arab Union for Astronomy and Space Sciences in Sharjah (United Arab Emirates).

Kunitzsch's first major publication, *Arabische Sternnamen in Europa* (1959), was an expanded version of his doctoral dissertation, which he finished during his stay in Cairo. It places the interest in the origin of peculiar modern star names that he developed during his school years on a solid scholarly basis by means of an extensive, detailed study involving published sources in Greek, Syriac, Arabic, medieval Latin and modern Western languages. Kunitzsch showed that the Arabic names of stars were first adopted in Europe when Arabic astronomical sources became known in Spain around the year 1000 and especially during the translation

movement from Arabic into Latin in the 12th and 13th centuries. Later adoptions and confusions took place in particular in Beyer's star atlas *Uranometria* (1603) and in Piazzzi's catalogue of stars published in 1803/1814. These mostly derived from Latin translations of Arabic works published in the 16th and 17th centuries and from philological studies of these works. An English summary of the results from *Arabische Sternnamen* can be found in the booklet *Short Guide to Modern Star Names and Their Derivations* (1986; revised edition *A Dictionary of Modern Star Names*, 2006), written together with Tim Smart.

While his dissertation still had a primarily European perspective, in later publications Kunitzsch widened his scope significantly to include sources that influenced the transmission of star names at much earlier stages. In *Untersuchungen zur Sternnomenklatur der Araber* (1961) he discussed 329 original (i.e. non-Ptolemaic) Arabic star names on the basis of the work of early Arabic lexicographers and philologists found in the *anwā'* literature (especially Ibn Qutayba and Abū Ḥanīfa) and of the *Kitāb Šuwar al-kawākib* (AD 964) by 'Abd al-Raḥmān al-Šūfī (in Latin: Azophi), who made the first comprehensive attempt to identify the original Arabic names with the stars listed by Ptolemy in the *Almagest*. Kunitzsch found that the development of star names can be traced along several paths: originally Babylonian names were adopted both by the Greeks as well as in the pre-Islamic Arabic star lore. The Arabs combined the Babylonian names of the constellations with Bedouin names for animals and objects that played an important role in their lives and with some traditional popular names whose meanings cannot anymore be determined. The Greek star names were rendered into Arabic during the translation movement of the ninth century, resulting in parallel names for the same constellations or stars, e.g. *al-jawzā'* and *al-taw'amān* for Gemini. *Untersuchungen* remains the primary source for the origin of the names of the lunar mansions in Arabic names.

A full study of the designations of the 48 constellations and 1025 stars in the star catalogue in Ptolemy's *Almagest* was the logical next step in this series of investigations. Kunitzsch carried out this research as part of his Habilitation and published it in 1974 under the title *Der Almagest. Die Syntaxis Mathematica des Claudius Ptolemäus in arabisch-lateinischer Überlieferung*. In the analytical first part of this book, a careful inventory of all lost and surviving versions of the *Almagest*, starting with the Middle-Persian and Syriac translations, on the basis of all accessible Arabic and Latin manuscripts and a detailed study of references in the Arabic biobibliographical literature, made Kunitzsch the main authority for the traditions of the Arabic and medieval Latin *Almagest* up to our time. Both

for this book and for his later full edition of the star catalogue, Kunitzsch also considered the important secondary tradition («Nebenüberlieferung»), which consists, among others, of such important works as Naṣīr al-Dīn al-Ṭūsī's *Tahrīr al-Majisṭī* (Alamut, AD 1247), which includes the entire Ptolemaic star catalogue for its original epoch AD 147; al-Ṣūfī's catalogue already mentioned above the complete catalogues in the astronomical handbooks of al-Bīrūnī (Ghazna, c. 1030) and Ulugh Beg (Samarqand, 1437) and the extract in al-Battānī's *Ṣābi' Zīj* (Raqqā, c. 900), which includes around half of the stars from the *Almagest*. The second part of the book contains full overviews and extensive discussions of the variants found in these sources for all 650 star names that have characteristic elements (i.e. are not only expressed as «next to» or «following» another star). This shows very clearly how, on the one hand, translations of the Ptolemaic designations of the stars with respect to their constellations are combined with the original Arabic names and how, on the other hand, further variants resulted from different translations of such common words as «bright star» (*muḍī'* vs *nayyir*) or «shoulder» (*katif* vs *mankib*) or from misreadings or misinterpretations of the original names.

One more source belonging to the secondary tradition, namely Ibn al-Ṣalāḥ al-Sārī's treatise on the errors and scribal mistakes in Ptolemy's star catalogue (extant in Istanbul and Oxford), is an excellent example of the type of important sources that Kunitzsch was able to identify thanks to his detailed knowledge of the secondary literature and his meticulous study of the primary sources and was able to obtain access to due to his excellent contacts in the field. It is from this treatise that Kunitzsch took the information that he loved to quote till the end of his life:¹

In the middle of the twelfth century, Ibn al-Ṣalāḥ had access to five different versions of Ptolemy's *Almagest*: a Syriac translation from the Greek; a translation from Greek into Arabic made by al-Ḥasan ibn Quraysh for the caliph al-Ma'mūn; a translation from Greek into Arabic by al-Ḥajjāj, likewise for al-Ma'mūn; an unrevised translation from Greek into Arabic by Ishāq ibn Ḥunayn (available to Ibn al-Ṣalāḥ in an autograph copy); and that same translation revised by Thābit ibn Qurra.

In his treatise Ibn al-Ṣalāḥ painstakingly compares the stellar coordinates and magnitudes in all five versions and registers and explains any differences that he notes. In his 1975 *Zur Kritik der Koordinatenüberlieferung im Sternkatalog des*

1. *Der Almagest* (1974), pp. 22-24; *Ibn al-Ṣalāḥ* (1975), pp. 40-41.

Almagest, Kunitzsch critically edited the entire text with an extensive commentary. He furthermore added discussions of the star tables of al-Battānī and Kūshyār ibn Labbān (Iran, c. 1000), whose dependency on the now lost early Ma'mūnic translation of the *Almagest* he was able to show on the basis of Ibn al-Ṣalāḥ's work.

The single remaining *desideratum* for a full control of the star names and coordinates in the medieval tradition was now a critical edition of the star catalogue in the *Almagest* in its Arabic and Latin versions. Kunitzsch completed this with *Der Sternkatalog des Almagest. Die arabisch-mittelalterliche Tradition*, published between 1986 and 1991. The three volumes contain:

- (1) Parallel critical editions of the Arabic translations by al-Ḥajjāj and Ishāq/Thābit and German translations of these that stay as closely as possible to the originals.
- (2) A critical edition of the very literal Latin translation by Gerard of Cremona, prepared in the second half of the twelfth century. This translation exists in an earlier **A** and a revised **B** version, generally follows the Arabic of Ishāq/Thābit, but with numerous elements from the al-Ḥajjāj translation. Kunitzsch incorporated in his apparatus 34 of the more than 50 surviving manuscripts as well as the early print Venice 1515.
- (3) (supplemented by an introduction in English) A comprehensive concordance of the coordinates in all primary versions of Ptolemy's star catalogue, namely the Greek as edited by Heiberg on the basis of four early manuscripts, the Arabic and Latin as edited by Kunitzsch in volumes I and II, and additionally al-Ṭūsī's *Tahrīr al-Majisī* and the Latin *Almagest* translation from the Greek made in Sicily around 1150. As a «bonus», Kunitzsch provides a concordance of the faulty editions of al-Ṣūfī's *Kitāb Ṣuwar al-kawākib* by Schjellerup and the Osmania Oriental Publications Bureau in Hyderabad with the three oldest known manuscripts of this work, allowing the reader a reliable access to this source as well.

It is impossible to discuss here in detail the subjects of Kunitzsch's more than two hundred other publications. Besides studies on new types of *anwā'* treatises, the classification of types of star tables, specific star tables and the names of specific stars, the astrological significance of certain types of star lists, the star catalogue of the Alfonsine Tables based on Gerard's Latin translation and the «Ṣūfī Latinus» tradition and its influence on the star maps of Peter Apian, Kunitzsch also published glossaries of Arabic and Latin astronomical terminology and wrote arti-

cles on astrolabes, celestial globes, the transmission of knowledge from Greek Antiquity to the Islamic world and on to Europe, and the occurrence of Arabic names in western poetry and literature.

After his retirement Kunitzsch found a second home at the Munich University Chair for History of Science of Professor Menso Folkerts, which was housed in the Deutsches Museum until 2011. He there worked together intensively with Richard Lorch, resulting in the publication of Arabic and Latin versions of the Spherics and several smaller works by Theodosius, as well as various other important mathematical works. Most recently Kunitzsch collaborated with Ralph Neuhäuser and several other colleagues on traces of astronomical phenomena (such as supernovae) in medieval Arabic sources.

Although the meticulousness and the huge extent of Kunitzsch's publications may make one believe that he was a scholarly recluse, nothing is further from the truth. In February 1973 he spent two weeks in a hotel on the southern coast of Ceylon in order to observe the heavens as the ancient and medieval astronomers must have seen it, with special attention for the southern constellations that were invisible from the locations where Ptolemy and many Islamic astronomers were active. In April/May 1968 and March/April 1981 he made extensive lecture trips in North Africa and the Middle East during which he presented his findings in Arabic. He was a very regular participant in conferences in Europe and the Arabic world, at which he would read his carefully prepared lectures, nearly all of which were published in proceedings.

Several dozens of Kunitzsch's most important articles were reprinted in the two Variorum volumes *The Arabs and the Stars* (1989) and *Stars and Numbers* (2004). On the occasion of his seventieth birthday (2000) a Festschrift with the appropriate title *Sic itur ad astra* and significant contributions by more than thirty colleagues appeared with Kunitzsch's house publisher Harrassowitz.²

It has been a privilege and a great pleasure to get to know Professor Kunitzsch better during my employment in Munich since 2008. I found him to be an extremely friendly person, always prepared to help in any way and never in a bad mood, although he was increasingly bothered by several types of physical prob-

2. Menso Folkerts and Richard Lorch (eds), *Sic itur ad astra. Studien zur Geschichte der Mathematik und Naturwissenschaften. Festschrift für den Arabisten Paul Kunitzsch zum 70. Geburtstag*, Wiesbaden: Harrassowitz, 2000. Some of the information on Kunitzsch's life in this obituary was taken from the extensive «Lebenslauf» included in the Festschrift.



Paul Kunitzsch (second from the right) in 2016 with other affiliates of the project *Ptolemaeus Arabus et Latinus*; from left to right: Menso Folkerts, Mohammad Mozaffari and the present author.

lems. He was a man of fixed habits, who carefully planned his trips in Germany or abroad and reserved specific times for all routine activities during the day. During the more than forty years that he lived in his apartment in the Davidstraße in Munich he not even once turned on the cooking plates or the oven, but instead went out for a cooked lunch every day. After his retirement he usually had this lunch together with Menso Folkerts and Richard Lorch at the European Patent Office, next to the Deutsches Museum. Since 2013, he became a regular participant in the team lunches of the Bavarian Academy project *Ptolemaeus Arabus et Latinus* in a local Indian restaurant. Without a single exception, he always ordered an extra spicy chicken curry with a Green Veltliner white wine. Whenever we would ask him for help on a specific research topic or to correct a transcription of an Arabic text, he would inform us of his detailed program and assured us that he would not have time for at least the next six weeks. Nevertheless, his highly detailed and accurate responses and comments usually came within some days.

His fixed habits prevented Kunitzsch from learning how to use the personal computer, which became ubiquitous only after his retirement. But till just before his hospitalisation he continued to reply promptly and in detail to questions and requests that had reached him either by ordinary mail or through the email ac-

counts of colleagues by means of letters carefully typed on his decades-old typewriter. To these letters he would then carefully add by hand Arabic quotations and the diacritical symbols on transliterated words. Hundreds of colleagues all over the world have in this way benefited from his friendliness and his extensive knowledge on the wide variety of topics represented in his publications.