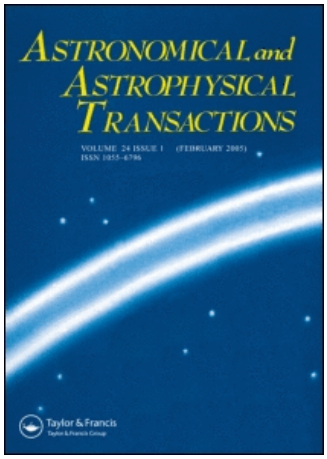

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A. A. Gurshtein [a]; E. N. Kaurov [b]; T. M. Potemkina [c]; D. S. Raevsky [d]
[a] Institute for History of Science and Technology RAS,
[b] Euroasian Astronomical Society (EAAS),
[c] Institute of Archaeology RAS,
[d] Institute of Oriental Stadies, Moscow, Russia

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ON THE STATUS OF ARCHAEOASTRONOMY IN RUSSIA

A. A. GURSHTEIN[1], E. N. KAUROV[2], T. M. POTEMKINA[3], and D. S. RAEVSKY[4]

[1] *Institute for History of Science and Technology RAS*
[2] *Euroasian Astronomical Society (EAAS)*
[3] *Institute of Archaeology RAS*
[4] *Institute of Oriental Stadies Moscow, Russia*

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This paper is primarily concerned, with the results of work conducted in 1993–1994 in Europe. Also information concerning more recent Russian results is added.

KEY WORDS Archaeoastronomy

Recent years have seen an upsurge of an interaction between such disciplines as astronomy, archaeology and history in research on some of their interdisciplinary problems. The Europian Society for Astronomy in Culture (SEAC) qualifies such problems as problems of archaeoastronomy and/or ethnoastronomy.

The determination and the specification of the main problems in archaeoastronomy were noted by the British astronomer G. S. Hawkins, who discovered in his well–known work of 1960–1963 the astronomical content of an ancient relic – Stonehenge dated from the second millenium BC.

At once G. Hawkins paid attention to some new feature of archaeoastronomy. So, he wrote: "If I can catch a conformity in a general interconnection or functions of various parts of Stonehenge, then, you see, its creators should have known these facts".

Characterizing this hypothesis, he continued: "It appeared to me as a conservative one, so it is based on an assumption, that the builders of Stonehenge were like me, but no more clever that me. But many facts, such as, for instance, the 56-year eclipse cycle were known neither to menor to other astronomers, but were found (being said more correctly "discovered again") the solution of a Stonehenge puzzle".

After Hawkins the same researches began to be developed in many countries.

After 30-years experience of research in this field one may determine, that archaeoastronomy is a sphere of science that is at the boundary of the humanities and natural science; it is researching the relics of past epochs by means of historical

(including archaelogical) and astronomical methods, those having the aims both of a reconstruction of archaic ideas (taking into account also a factor of a natural enviroment) and an explanation of modern astronomical hypotheses.

This preliminarly definition is the subject of the next more accurate determination.

According to an estimation of SEAC in 1994–1995 archaeoastronomical researches are carried out in not less than 16 contries of Europe (in Russia, Ukraine, United Kingdom, Germany, Italy, Spain, Poland, Hungary, Romania, Greece and others). Having no pretension on the fullness of this observation we want to cite some kind of researches in European countries (some information about European research is selected from SEAC Newsletter No. 1).

BRITAIN. Aubrey Burl (Birmingham) completed a large study of the relationship in size, shape and aligments between the great stone circles of northwestern England and southwestern Scotland dated to the Late Neolithic (about 3000 BC). Clive Ruggles (Leicester University) has been working recently with Susan Hills (Nottingham University) to develop Bayesian hierarchical methods for analysing data on astronomical orientations. Finally, he has been working to establish a multi-media database for archaeoastronomy.

BULGARIA. Alexey Stoev (Astronomical Observatory in Stara Zagora) is currenly working on lunar images from the Neolithic and Eneolithic sanctuaries in Bulgaria.

Peter Valev (Archaeological Institute and Museum, Bulgarian Academy of Sciences, Sofia) carried out an archaeoastronomical survey of Thracian tombs at Shipka (lat. 42°40′, long. 25°20′) and Hissar (lat. 42°30′ N, long. 24°50′ E). The purpose of the survey (supported by the Academy of Sciences) is to study religious–philosophical and mathematical–astronomical bases of the cult construction in ancient Thrace.

CZECH REPUBLIC. Emilie Pleslova-Stikova (Prague) initiated a new research project entitled Central Europe, Fourth millennium BC: the beginnings of the exact sciences.

Zdenec Ministr (Kladno) continued investigations concerning the astronomical orientations of the Neolithic so-called rondell-like enclosures, Celtic rectangular structures, and the earliest church buildings from the territory of Bohemia and Moravia.

Ladislav Krivsky (Astronomical Institute, Ondrejov) is continuing work on the solar cult in Egypt focussing on the hypothesis that the pyramidal shape could have been modelled on a pyramidal shape of the rising sun.

GERMANY. Franz Tichy (Erlangen) is continuing research on the ritual significance of the solstices in Prehistoric and Medieval Central Europe. Some interesting investigations were done by Prof. W. Schlosser.

HUNGARY. Ildiko Ecsedy (Department of Oriental Languages, Institute of Linguistics, Hungarian Academy of Sciences, Budapest) along with Katalin Barlai (Konkoly Observatory) completed the study of the use of a sidereal calendar among the agricultural populaton of ancient China. Both scholars are continuing research on the astronomical tradition of ancient China.

ITALY. Giuliano Romano (Department of Astronomy, Padova University) continued his research in the Andes. After completing his investigations in Peru he has carried out fieldwork measurements in several sites in Bolivia and Columbia. On the other hand, he is active in investigating church orientations in northern Italy.

POLAND. Mariuz Ziolkowski (Andean Archaeological Mission, Warsaw University) continued his research on Andean astronomy and calendries.

Stanislav Jwaniszewski (State Archaeological Museum, Warsaw) completed a 2-year research in Biskupin (Bydgoszcz voivodeship, Central–Western Poland).

Arnold Lebeuf (Institute of Archaeology, Warsaw University) completed a 2-month research project in Mexico (investigations made in Xochicalco and Tabasqueno). He also investigated the astronomical and calendric content of Indo–European folk culture and the allegorical transmission of astronomical knowledge.

Elzbeta Siarkiewicz (Department for Iberian Studies, Warsaw University) completed a comprehensive study of ancient Mesoamerican astronomy.

ROMANIA. A multidisciplinary project entitled "Astro–Dacia" was proposed jointly by the Romanian National Museum in Bucharest (Radu Florescu), the Museum of Transylvania at Cluj (Gheorghe Lazarovici) and the University of Sibiu (Florin Stanescu).

National Conferences on Archeometry and Archaeoastronomy are organized yearly in Cluj by Georghe Lazarovici. Archaeoastronomy was also among the topics of the Conference on Archaeology held in Deva in December 1993.

SPAIN. Growing archaeoastronomical activity may be observed in the Canary Islands. José Barrios Garcias (University of La Laguna, Tenerife) research focused on the traditional astronomical concept and calendars of the Guanches before the Spanish conquest of the Canary Islands (c. 14th–15th centuries).

Antonio Aparicio (Canarian Institute of Astrophysics, La Laguna, Tenerife) in collabration with Juan A. Belmonte and Cezar Esteban (both at the same Institute) continued the fieldwork on the pyramidal complex of Chacona.

RUSSIA. In Russia, during the last few years archaeoastronomical studies have progressed significantly. Alexander Gurshtein (Institute for History of Science and Technology, Russian Academy of Sciences, Moscow) has developed a new hypothesis of the origin of zodiacal constellations.

In spring 1994 a two-day meeting on archaeoastronomy in Russia took place at the Institute of Archaeology, RAS. Several authors reported on archaeoastronomical investigations: (1) Tamila M. Potemkina (Institute of Archaeology, RAS) on circular structures in Savin (Siberia, about the third millennium BC); (2) L. A. Dryabina (Tumen University) on the Velygdany two circular monument (near Tumen); (3) N. M. Chairikina (Institute for History and Archaeology, Ural Division, RAS) on Boyarki site (near Ekatherinbourg); (4) Igor L. Kyzlasov (Institute of Archaeology, RAS) on the Tuim cromlech; (5) Galina G. Ershova (Inctitute of Archaeology, RAS, she is a close collabrator of Yu. Knorosov) on the Mesoamerican Milky Way perception some 6–8 millennia BC; and (6) I. K. Fedorova (Peter the Museum of Ethnography, Saint-Petersburg) on astronomical concepts of the ancient Polynesians.

I. A. Svyatopolk–Chetvertinsky (Russian Language Institute, Moscow) is currently studying astronomical cuneiform tablets from Mesopotamia.

The next meeting on archaeoastronomy in Russia took place in spring 1996 at the Sternberg State Astronomical Institute of the University, where archaeoastronomy was one of the session topics during the science memorial conference "Our Galaxy".

Notice should be taken of one more fact.

Under the heading "The ancient world in the light of interdisciplinary studies", "Journal of Ancient History" (No. 1(212), 1995) published a selection of articles of a round-table discussion devoted to the hypothesis of A. A. Gurshtein on the origin of the Zodiacal constellations.

Summing up preliminarly results of the present stage of development of archaeoastronomy in Russia some important points should be noted, that were revealed or confirmed in past research.

(1) Recently a considerable increase in research connected with solar physics in antiquitly has noted the important role of the ancient sun and its influence on the existence of ancient civilisations. It may be mentioned that various research has been carried out by some scholars both in Russia and in Europe: V. N. Obridko (IZMIRAN, Russia, Troitsk, Moscow Region), V. A. Dergachov (FTI, Russia, St Peterburg), G. E. Kocharov (FTI, Russia, St. Peterburg), G. V. Kuklin (Irkutsk, Russia), Shove (France), W. Leftus (Czech Republic) and others.

It should be noted, that at the present time the question, if objects of archaeoastronomical research are only products of human activity or natural historic objects too, is left open and is very real. In this connection the area of archaeoastronomical research in the field of the ancient sun is not definitly established.

(2) The determination of precise geographical coordinates of the researched archaeoastronomical complex are extremly important for the development of archaeoastronomy, because for lack of such information excavated and, therefore, destroyed relics, which had first possessed any astronomical functions, which were not realized by archaeologists during the first excavation, cannot then be archaeoastronomically interpreted conclusively enough by the next generations of research.

(3) A special interest, in the present instance, having had widespread interest both in the Old and New World, having arisen near the same epoch, is centric in plane having four marked vector constructions, oriented more or less precisely toward cardinal points, so far guaranteeing concordance of ideas about space and time inherent to its culture. The same complex of ideas is impressed in ornamental motiffes, that repeat similar structures (see works of E. W. Antonova).

(4) A careful analysis of archaeoastronomical data, that came from a Eneolithic sanctuary (coming from the middle of the third-millenium BC) having circular planning and astronomical orientation (Savin and Velygdany 2) revealed, first, six-sunny directions – points of sunrise and sunset in the days of solstices and equinoxes for the altitude of the location of relics and also for the point of moonrise in the calendar dates, and, second, one of the important directions – North–South direction, to which the principal sacrifices were timed.

A correction of this data with ethnographic and mythologic (folk-lore) materials let us propose with sufficient confidence that the creators of these relics used a

principle of gnomon and a moon – sun calendar, where the month was the only natural unit for numeration of time; with a month subdivided into weeks, and, opposite to this was made up to seasons, half-years and, finally, a year.

(5) The creators of those sanctuaries fixed a yearly cycle of the entire circulation of the sun, with seasons and the period of a moon circulaton. The form of a calendar then existing corresponded to cultural and economic organisation and with a certain way of realizing the world (for example, in a three-part model of the world) by the eneolithic people of the forest-steppe zone and the south-steppe zone of the Ural–Siberian region.

(6) At the end of the Neolithic–Bronze age (fifth to second millenium BC) in the region of contemporary Euroasia and North America, with the help of special structures ("observatories") for recording the light sources of the sky, a great interest to register basic calendar dates coincided in time with a period of the creation of a cattle-breeding economic-agriculture, and probably was occasioned by the needs of this development. The appearence around sanctuaries facilated for man the comprehension of laws of natural phenomena and stimulated the development of the first cosmological ideas in human history and simultaneously made a cult of natural powers more complicated.

(7) The subdividing of the constellations of the stars of the celestial sphere of the North hemisphere of the Earth have apparently more archaic sources and reasons and began most probably in the Paleolithic age.

(8) A corresponding interpretation of systems of archaic symbols, in particular, Zoomorphic, are possible aspects of research. A zoomorphic symbolism of celestial bodies, constellations, the phenomena of a natural cycle, are wide by represented in different ancient and archaic cultures stimulating numerous interpretations (of a type of reasoning about "sun deer" etc.) of Zoomorphic images of the fine art of very different ancient peoples even in such situations, that we do not dispose of a direct indication to a corresponding semantic of those images. By no means we do not refute the possibility that those images are really connected with the astronomical ideas of the creators of one or another culture, but it is necessary to accentuate, that such an interpretation always demands detailed underpinnings, taking into account the different character of interpreted relics. The same concern applies to the interpretation of non-figure ornament.

Although the experience of archaeoastronomical researches and especially the cooperation of specialists of close by related fields of this branch of science (especially archaeologists and astronomers) is not sufficient at the moment for general deducations, some important conclusions can be formulated.

By excavation of the relics for which there are reasons for them to be proposed as having archaeoastronomical content, the participation and cooperation of specialists–astronomers are absolutly necessary for a determination directions to mark out that are typical for the calendar interpretation at the present altitude.

The participation of astronomers is necessary too in the process of interpreting plan structures of a corresponding relics. It may be found in such a coop-

eration that in the process such elements of planning of relics would be discovered, that contains fundamentally new archaeoastronomical information, that would not taken into account by archaeologists in the absence of the participation of astronomers.

Another important point of the necessity of team–work may be working out methods of reasearch of archaeoastronomical objects.

No doubt the information obtained by such cooperation may be very relevant and useful for a solution of astronomical problems too.