

ETHNIC AND MORPHOLOGICAL AFFINITIES OF TWO
BRONZE AND IRON AGE POPULATIONS OF NORTH
PAKISTAN

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Abstract: With the help of multivariate statistical methods an attempt has been made to clarify the morphological and ethnic affinities of the skeletal remains from the cemeteries of Timargarha in the Hindukush, belonging to the Gandhara Grave Culture and from Sarai Khola near the famous prehistoric and historic town of Taxila. According to C-14 analysis the two cemeteries date back to the 1st millennium B. C. and earlier. Both skeletal series show the closest morphological affinities to skeletal findings from western Asia and eastern Europe so that a western origin of these populations may be assumed.

Key words: Ethnic affinities, Morphological affinities, Bronze Age, Iron Age, North Pakistan.

Introduction

Our knowledge of the prehistoric and historic anthropology of South Asia was enriched in the nineteen sixties by extensive excavations of ancient cemeteries carried out by Pakistani, Italian and German archaeologists and anthropologists in Northwest Pakistan and especially in the mountain area north of Peshawar as well as in the vicinity of Taxila, an old prehistoric and historic town which was for many centuries a famous Buddhist center. The cemeteries belong to the period of the last half of the 2nd and the 1st millennium B. C. This period was for the population history and biology of the Indian subcontinent of great importance as at that time several migrating waves reached South Asia from the northwest. Most important was the Indo-Aryan immigration which penetrated in several waves over the Afghan passes to South Asia. Here in the course of about one thousand years they conquered large parts of the Indian subcontinent where they assimilated the aboriginal population culturally and linguistically. To this immigration can be attributed the fact that in large parts of present-day India Indo-European languages are spoken (see BERNHARD 1983).

Skeletal material from the Gandhara Grave Culture

In the area north of Peshawar and east of the Khyber Pass Pakistani and Italian archaeologists discovered a new cultural complex represented by large graveyards with rich grave furniture. As this area corresponds to the region of the old Buddhist center of Gandhara in later times, the Pakistani archaeologist DANI has proposed the term Gandhara Grave Complex or Gandhara Grave Culture (DANI 1967, 1980).

Figure 1 shows the archaeological sites in West Pakistan where graves of the Gandhara Grave Culture have been found. Extensive studies have been carried out by myself in 1967 on skeletal materials from the cemetery of Timargarha in the Panjkora Valley (BERNHARD 1967, 1968a and b) and by the Italian anthropologist ALCIATI (1967) from Butkara II in the Swat Valley. Both sites are situated on the southern slopes of the mountainous region of the Hindukush. In recent times ALCIATI and MARCOLIN (1979) published arithmetic means of a third skeletal series from Loebanr I situated in the Swat Valley as well.

In Timargarha and also in other sites of the Gandhara Grave Culture three main cultural and chronological periods can be distinguished which differ from one another by changes in the cultural elements and especially with regard to the burial practice (see DANI 1980).

In Period I, which belongs to the end of the Bronze Age, only burials in flexed position has been found. In Period II we have evidence of cremation. The cremated bones and ashes were collected together and deposited in urns of different types (box-urns, visage-urns and ordinary globular vases with lids on them). Period III is characterized by the introduction of iron and a new burial rite of multiple burials or burial of bones after exposure (see DANI 1980, p. 126).

When the new grave complex was discovered, *Prof. Tucci*, the head of the Italian Archaeological Mission in Pakistan, voiced the opinion that "these tombs belong to the Assakenoi of the Greek historians — the Āswakāyana of the Sanskrit authors — and allied tribes, that spread all over Swat and its bordering countries from about the 9th or perhaps the 8th century B. C." (TUCCI 1963; TUCCI in ALCIATI 1967, p. 9). This assumption which was taken over by all subsequent Italian writers (DANI 1980, p. 122) seemed to be confirmed by a C-14 dating performed on half-burned bones of the cemetery of Butkara II giving an age of 2425 ± 40 years or approximately 475 B. C. (ALCIATI 1967, p. 1 and 39).

According to C-14 dating of skeletal material from Timargarha a higher age of the cemetery must be assumed. The C-14 analysis was performed on bones of grave 101 from Timargarha, where a burial in flexed position of Period I had been superimposed by a fractional burial of Period III (see RAHMAN 1967, p. 82). The older flexed burial of Period I gave a radiocarbon date of 3380 ± 60 years which corresponds to the 15th century B. C. (BERNHARD 1967, p. 291) whereas the age of the bones of the fractional burial of Period III is 2805 ± 60 years and thus belongs to the middle of the 9th century B. C.* Meantime the earlier dating of the Gandhara Grave Complex has been confirmed by C-14 dating of Italian scientists too (see DANI 1980, p. 124 and ALCIATI and MARCOLIN 1979).

In Timargarha I was able to collect and study both unburnt and burnt skeletal remains from 137 individuals found in 82 graves. Due to the bad state of preservation and a great number of cremated bones and children burials only 20 skulls of adult individuals (9 males and 11 females) were in a good condition or could be restored that they were useful for anthropometric studies. From these skulls No. 01, 03, 04, 05 (males) and 02, 06, 101a (females) belong according to the burial rite to the above mentioned Bronze Age Period I while

* The C-14 analysis was carried out in 1966 by Mrs. M. MÜNNICH, Institute of Environmental Physics, University of Heidelberg, Federal Republic of Germany.

the remaining skulls 101c, 139, 142a, 165a, 173a (males) and 101b, 134, 142b, 144, 157, 173b, 186, 197a (females) were recovered in the Iron Age graves of Period III (see also BERNHARD 1967, DURRANI 1967, p. 65 ff and RAHMAN 1967, p. 82 ff). The stature was calculated on the basis of measurements of 29 individuals (17 males and 12 females) all of them belonging to Period III.

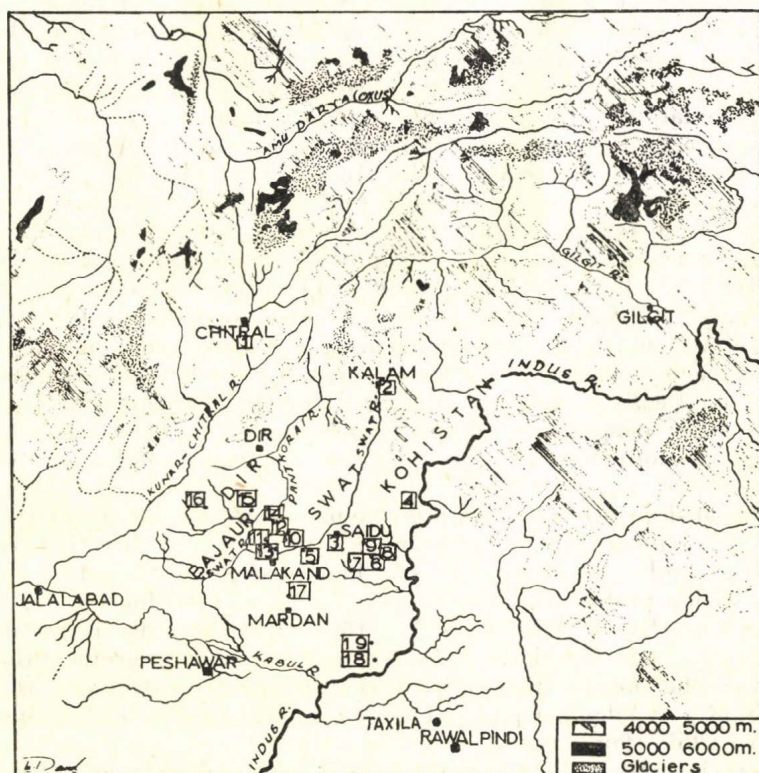


Fig. 1. Distribution of graves in North West Frontier (Pakistan) 1. Chitral Noghormur, Bala Hisar, Tamunak; 2. Ushoram, Rashnel (Kalam Valley); 3. Loebanr, Butkara II, Katelai (Swat); 4. Kherai (Gorband Valley, Indus Kohistan); 5. Thana (Malakand Agency); 6. Tarike, Lalbatai, Sogalai, Pulnar (Buner); 10. Chakdara, Chatpat, Shamlai, Ziarat (Dir District); 14. Timargarha, Balambat (Dir District); 16. Inayat Qila (Bajaur); 17. Jamalgarhi (Mardan District); 18. Panchpir; 19. Maneri Payan (from DANI 1980)

Though the sample is relatively small in number, the morphological variability of the skulls is astonishingly great. At least five different main morphological types can be distinguished. Of particular anthropological interest is a morphological type which is mainly characterized by a marked alveolar prognathism. This type is also present in the skeletal series from Butkara. Similar types can also be traced in Central Asia (Turkmen) already in the 5th millennium B. C. in Monzukly Tepe and later in Kokča 3 in Kalaly Gyr 1 (see BERNHARD 1967, 1968 a and b).

On the basis of the arithmetic means of the cranial measurements and indices (Table 1) the population of the Timargarha cemetery, especially the male group, is extremely long- and narrow-headed (dolichocranic), high-vaulted (acrocranic) with a narrow nose and a moderately high face, as is indicated by the cranial index, breadth-height index, nasal index and upper facial index. Most of the characteristic features of the series of Timargarha are also present in the material from Butkara II (Table 1). There are, however, some differences especially in the breadth measurements, as, for example, the bizygomatic and bigonial width, which may be attributed to the fact that both series are relatively small in number. In favour of this interpretation is the fact that the mean values of the largest series, that from Loebanr, have an intermediate position and are in most cases more similar to the series from Timargarha (Table 1). The mean values of the female series from Timargarha are for most of the measurements lower according to the sexual dimorphism (Table 1).

The Penrose distance, a multivariate statistical method, was used to reveal the morphological affinities with other pre- and protohistoric skeletal findings. Skull series of the Late Neolithic, Bronze and Early Iron Age and of the time period from 2500 B. C. to 500 A. D. from Europe, North Africa, South, Central and North Asia were included for purposes of comparison. The approximate locality for each of these skull series is shown by numbers on the general map (Fig. 2). Statistically significant similarities between the material from Timargarha and other comparison groups, that is to say, Penrose distances with a probability of more than 95% and 90% are shown by solid and dotted lines respectively.

The relationships provide an impressive picture as most of the morphological similarities are focused in a northern and northwestern direction, especially toward East and Central Europe. The highest degree of similarity (Penrose distances with a probability of more than 95%; see solid lines in Fig. 2) is observed in Tepe Hissar III (series No. 106), a Sakas series from the Pamir (No. 2002) and Tasty Butak (No. 426) belonging to a border group of the Andronovo culture, but not in other series of this culture in Central and North Asia, though from a typological point of view connections can be anticipated (see BERNHARD 1967, 1968a and b).

Of special interest is the fact that no statistical similarities exist between the Timargarha material and the skull findings of the Indus civilizations from Mohenjo-daro and Harappa.

The morphological similarities of the series from Timargarha agree with the results of the comparative analysis of the archaeological findings which in the opinion of DANI (1980) have brought out the close relationship between the Gandhara Grave Culture and the material culture of northeastern Iran in the 2nd and 1st millennia B. C. Relationships exist especially with the Iranian sites of Tepe Hissar (Phases I and II), Hasanlu, Shah Tepe and Tepe Sialk. According to the Italian archaeologist ANTONINI (1969, p. 102), there are also some links between the Gandhara Grave Culture and Soviet Central Asia which are however, in the opinion of DANI (1980, p. 131) not very strong. DANI and other archaeologists like ALLCHIN and HAMMOND (1978, p. 409) are therefore of the opinion that the bearers of this new culture are in some way connected with the invading Aryans, who up to now are known to us less from archaeological remains than from literary source.

Table 1

Measurements and indices of the skeletal series from Timargarha (BERNHARD 1967), Butkara II (ALCIATI 1967), Loebanr I (ALCIATI and MARCOLI 1979) and Sarai Khola (BERNHARD 1969, 1981)

MARTIN numbers	Measurements and Indices*	Timargarha (males)		Butkara (males)		Loebanr (males)		Sarai Khola (males)		Sarai Khola (females)		Timargarha (females)	
		N	\bar{X}	N	\bar{X}	N	\bar{X}	N	\bar{X}	N	\bar{X}	N	\bar{X}
1	Max. cranial length	(9)	190.2	(7)	190.7	(32)	192.6	(18)	182.5	(10)	173.1	(10)	180.2
8	Max. cranial breadth	(9)	132.0	(7)	129.7	(30)	134.2	(18)	142.1	(10)	133.2	(10)	130.9
17	Basis-bregma height	(9)	136.0	(5)	138.5	(16)	133.7	(13)	130.1	(7)	125.4	(5)	129.2
9	Min. frontal breadth	(8)	93.8	(5)	97.5	(27)	98.0	(17)	98.1	(8)	93.8	(9)	91.7
45	Bizygomatic breadth	(6)	133.0	(5)	123.5	(8)	128.4	(17)	132.6	(8)	121.9	(6)	122.3
47	Total facial height	(6)	119.3	(3)	114.4	—	—	(16)	115.8	(8)	109.6	(6)	113.2
48	Upper facial height	(8)	70.3	(5)	66.8	(9)	69.1	(17)	68.9	(8)	65.6	(7)	66.6
52	Orbital height	(8)	33.3	(6)	32.9	(16)	33.5	(18)	34.7	(9)	34.0	(8)	33.1
51	Orbital breadth	(8)	41.5	(5)	40.3	(15)	42.7	(17)	41.3	(8)	40.1	(7)	40.0
55	Nasal height	(8)	50.0	(4)	48.8	(10)	51.0	(17)	51.8	(8)	48.9	(8)	48.1
54	Nasal breadth	(8)	22.9	(5)	24.9	(10)	25.5	(16)	24.4	(8)	23.9	(7)	22.9
66	Bigonial breadth	(5)	102.6	(3)	95.4	(9)	99.2	(18)	97.6	(10)	91.5	(4)	94.0
8 : 1	Cephalic index	(9)	69.4	(7)	68.1	*	69.7	(18)	77.9	(10)	77.1	(10)	72.9
17 : 1	Length-height index	(9)	71.6	(5)	73.3	*	69.4	(13)	70.8	(7)	72.7	(5)	72.6
17 : 8	Breadth-height ind.	(9)	103.2	(5)	106.5	*	99.6	(13)	92.2	(7)	96.0	(5)	102.0
45 : 8	Tr. cranio-fac. ind.	(6)	100.7	(5)	95.0	*	95.6	(17)	93.3	(8)	92.8	(6)	94.7
47 : 45	Total facial index	(5)	88.7	(3)	93.4	*	—	(16)	87.3	(7)	89.9	(4)	90.1
48 : 45	Upper facial index	(6)	51.9	(4)	54.9	*	53.8	(17)	52.0	(7)	53.2	(5)	52.2
52 : 51	Orbital index	(8)	80.6	(5)	80.9	*	78.5	(17)	83.9	(8)	85.9	(7)	83.3
54 : 55	Nasal index	(8)	46.5	(4)	48.3	*	50.0	(16)	47.4	(8)	49.0	(7)	48.3
66 : 45	Jugo-mandib. index	(5)	77.5	(2)	77.2	*	77.3	(17)	73.8	(8)	74.8	(3)	77.1
	Cranial capacity	(9)	1411.8	(7)	1422.0	—	—	(18)	1421.0	(9)	1206.0	(10)	1314.9
	<i>Stature:</i>												
	MANOUVRIER	(17)	168.0 cm	(6)	171.4 cm	—	—	(15)	167.8	(8)	155.6	(12)	158.4
	TROTTER & GLESER	(17)	171.6 cm	—	—	—	—	(15)	171.5	(8)	157.9	(12)	160.7

* Indices calculated from the arithmetic means

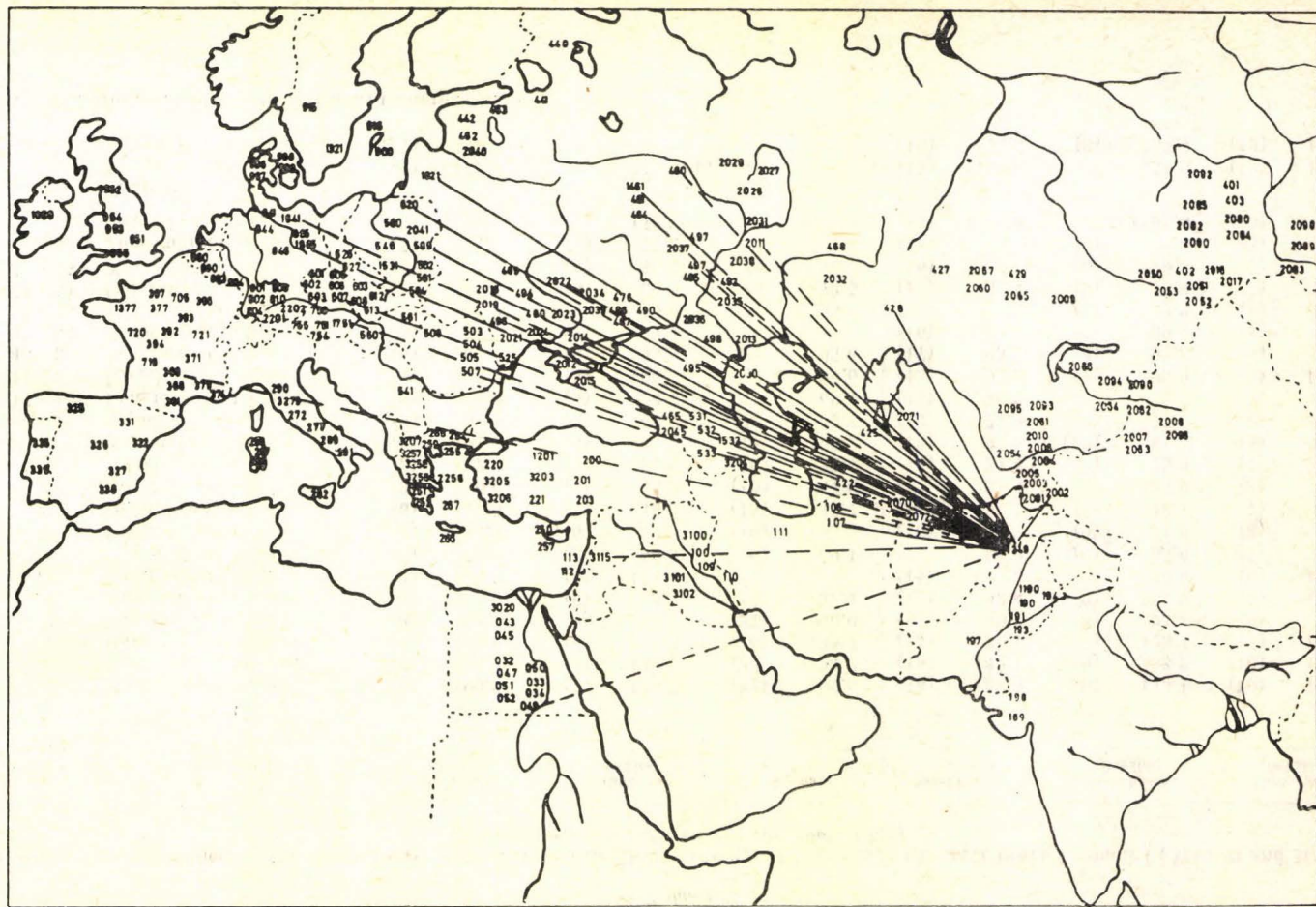


Fig. 2. Significant Penrose-distances between the series from Timargarha and prehistoric skull series from Asia, Europe, and North Africa (from BERNHARD 1968)

Skeletal material from Sarai Khola near Taxila

Apart from skeletal materials from cemeteries of the Gandhara Grave Culture in the nineteen sixties, an additional cemetery has been excavated in the vicinity of the famous prehistoric and historic town of Taxila, which in the last centuries B. C. was an important Buddhist center of Gandhara region (see BERNHARD 1969, 1981). It is situated only two miles southwest of Bhir Mound, the earliest settlement of Taxila near Rawalpindi (Fig. 1) and was designated as Sarai Khola Mound after the name of a small neighbouring village.

The excavation of the Sarai Khola Mound in the years between 1968 and 1971 revealed four main periods of human occupation extending from the Late Neolithic (Period I) and Early Medieval times (Period IV). One of the most important and also unexpected findings of the excavation was a cemetery in Period III which was separated by layers of deposit from Period II (Kot Diji Period ca. 2800 B. C.) and the Medieval Period IV (ca. 700—800 A. D.; see HALIM 1970—71, p. 34—36; BERNHARD 1981).

In the Sarai Khola cemetery of Period III the graves were dug in parallel rows. In the graves the skeletons were lying in extended position and orientated in eastwest direction (head toward the east.) One of the most important and unusual characteristics of the cemetery is the absence of any grave furniture so that the people who used the Sarai Khola Mound for the disposal of their dead remain at present unidentified. Only in some graves of the late cemetery a small number of iron objects have been recovered which include two finger rings.

Due to the presence of iron objects it is possible to date the cemetery to after 1000 B. C. By means of C-14 datings of skeletal material it was possible to pinpoint the date even more specifically with the result that the chronological age is 270 ± 60 years B. C.*. This means that the cemetery belongs to the same time period when Taxila and the Punjab were conquered by Alexander the Great and later on became part of the Kingdom of Bactria which was established by the successors of Alexander the Great in the area of northern Afghanistan and western Pakistan.

During my stay in Taxila in the year 1968 I was able to collect skeletal remains from 47 graves. In the following excavating seasons (1969—71) an additional 65 graves were uncovered. The material is now located in Karachi and is intended to be worked on in the near future.

From the skeletons of the 1968 excavation season 18 male and 10 female skulls were so well preserved or could be restored that a large number of anthropological measurements and morphological observations could be carried out (Table 1).

In marked contrast to the long- and narrow-faced population of the Gandhara Grave Complex, the skeletal series from Sarai Khola is characterized by a relatively high percentage of brachycranial skulls. This can also be seen in the arithmetic means of cranial measurements which show relatively low values for cranial length and high values for cranial breadth (see BERNHARD 1969, 1981).

Due to its proximity there can be no doubt at all that the population which was buried in the Sarai Khola Mound was in some manner connected with Taxila and the outlined historical events. But just who were these people?

* This dating was carried out by Mrs. M. MÜNNICH, Institute of Environmental Physics, University of Heidelberg (II 4186—3396).

It would appear unlikely that they belonged to the native population of Taxila. According to reports of historians who accompanied Alexander the Great on his way to India, the Iranian custom of exposing the dead to the vultures (which might have been introduced at Taxila by Persian settlers in the 5th and 4th centuries B. C.) and cremation were practised in Taxila (see MAR-

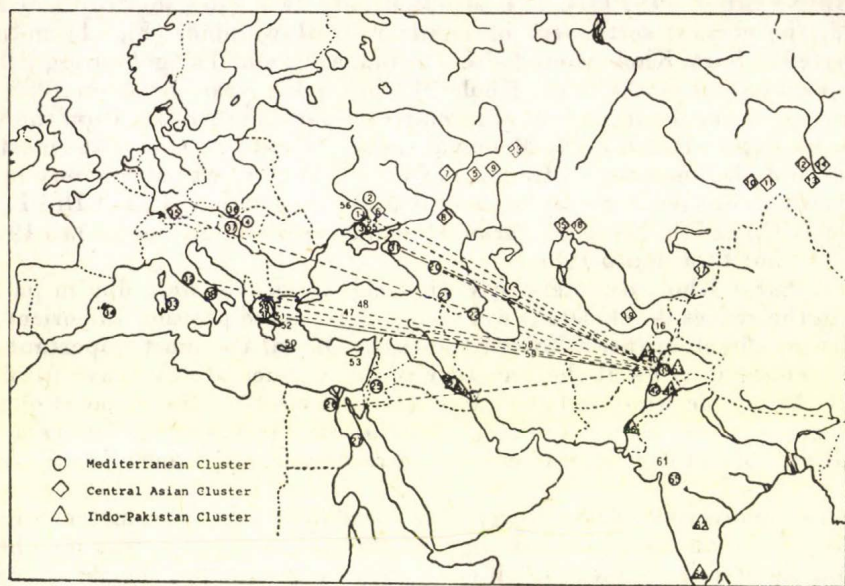


Fig. 3. Significant Penrose-distances between the series from Sarai Khola and prehistoric skull series from Asia, Europe, and North Africa. The symbols (circles, squares and triangles) indicate the grouping of the series to the different clusters (from BERNHARD 1981)

SHALL 1951, p. 16 ff). Also later in Buddhist times cremation was the usual burial method. This would seem to explain the fact that up to now no cemetery has been uncovered in Taxila. (The only skeletons which were found in Taxila do not belong to regular burials. They were excavated in the Dharmarajika Monastery at Taxila and were, according to Sir John MARSHALL, probably of the monks killed by the White Huns when they sacked and burnt the monastery about the end of the 5th century A. D.; see BERNHARD 1981).

It is likewise improbable that the burials of the Sarai Khola Mound belong to a village population which lived in the immediate vicinity of Taxila since the demographic composition of the population buried in the cemetery is quite unusual on account of the low frequency of burials of children which would not agree with a rural population.

For this reason it would appear that the cemetery of Sarai Khola was connected with foreign occupations of Taxila — especially the seizure of Taxila by Alexander the Great and the almost ten-year Greek garrison as well as the conquest and nearly one-hundred-year domination of the Bactrian Greeks.

The results of multivariate statistical analysis speak in favour of the latter possibility. Thirteen series of the Indo-Pakistan subcontinent were included

in this analysis and in addition 39 series from other parts of Asia, Europe and North Africa (for details see BERNHARD 1981). In Fig. 3 those series are connected by lines which show the closest morphological affinities to the Sarai Khola collection. It becomes evident that morphological relationships exist especially to the skeletal series from southeast and eastern Europe whereas no morphological affinities to skeletal series from India and Pakistan can be observed. According to the Penrose distance the closest morphological relationship exists with two Greek series, one from Greece (No. 30) and the other from the Greek colony of Phanogoria (No. 31) in the Black Sea area (see also BERNHARD 1981).

This is also confirmed by the results of the cluster analysis which show that not only these two skeletal series but also other Greek series are closely connected with the Sarai Khola population (see BERNHARD 1981). On the basis of these results it may be suggested that the cemetery of Sarai Khola is in some way related to the Greek rule over Taxila, namely that of Alexander the Great during his campaign to India or the later rule of the Bactrian Greeks.

This conclusion is also supported by the results of the analysis of the dentition of the Sarai Khola skeletal series by LUKACS (1983) indicating that the closest affinities of this group may be with people of southwest Asia of the Eastern Mediterranean.

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Etnikai és morfológiai kapcsolatok észak-pakisztáni bronz- és vaskori népességek között (Összefoglalás)

Multivariációs statisztikai módszerrel kísérletet tettek arra, hogy tisztázzák azoknak a csontmaradványoknak a morfológiai és etnikai kapcsolatát, amelyek a hindukushbeli Timargarha, Gandhara barlang-kultúrához tartozó temetőiből kerültek elő a híres prehistorikus és historikus város Taxila közelében lévő Sarai Kholából. A C-14 kormeghatározási módszer szerint a két temető az i. e. első évezredből és korábról származik. Mindkét széria a legszorosabb kapcsolatot mutatja a nyugat-ázsiai és kelet-európai leletekkel, úgy hogy e populációk nyugati eredete feltételezhető.

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