CHAPTER SIX

Tartans in the Tarim

The Tarim and Turpan basins offer one of the largest collections of textiles in the ancient world. Their study has been primarily confined to Western scholars such as Vivi Sylwan who made detailed examinations of material uncovered in the earlier excavations of Sven Hedin, Folke Bergman and Aurel Stein. The more recent discoveries have seen enormous accumulations of new material in much better dated contexts and some useful descriptive work by Chinese specialists, but more detailed analysis has been limited to the work of Irene Godd of the University of Pennsylvania and Elizabeth Barber of Occidental College, California, who were given partial access to some of the material (which provided a basis for Barber's fine book on the Xinjiang mummies and their textiles). Chinese archaeologists have been somewhat loath to surrender their material to foreigners for analysis. From their viewpoint, the archaeological treasures of China have been pillaged quite enough by Westerners and no one wants to defer to 'foreign experts' to interpret one's own heritage, especially when it concerns textiles, a field in which China has traditionally excelled. While this is understandable, it is frustrating to find the scientific reports which could place East Central Asia in the larger picture of the development of textiles in Eurasia so slow in coming. Textile production is not a mere adjunct to the cultural arsenal of a people: the materials employed and the technology involved in its production can be used to trace the course of cultural influences, possibly even migrations, while the decorative patterns employed in textiles or the cut of the material has long been known to be one of the more sensitive expressions of a culture's self-identity.

A Brief History of Twine

It is uncertain when humans began to clothe themselves although the circumstantial evidence of the freezing temperatures of the Ice Age coupled with the discovery of flint scrapers for cleaning hides would suggest that clothing (skin wraps at least) existed among the Neanderthals, i.e. even before the appearance of anatomically modern humans in Europe. By about 20,000 years ago we find in France what are interpreted as bone and antler needles that indicate the sewing of animal skins or textiles manufactured from plant and tree fibres, e.g. bast, a woody fibre derived from the linden and willow. Even earlier we have some evidence for nets about 26,000 years ago (from the Czech Republic) and a twisted cord of three-ply strands of spun vegetable (bast) fibre that dates to about 15,000 BC. A massive amount of circumstantial evidence such as pendants, bead necklaces, etc., indicates the widespread use of string or cord both during and after the last glaciation.

Flint or other stone scrapers continue in abundance through the Neolithic and remind us that wrapping oneself in the skins of animals has always been an option. Textile finds across Eurasia from the earlier part of the Neolithic are almost uniformly of plant fibres, particularly flax and hemp. Flax, which provides linen, was probably the most widespread plant employed for clothing and, while we have no evidence for its domestication until c. 3500 BC, we do have evidence for linen textiles that precede such a date. This suggests either that people had domesticated the plant earlier than present evidence allows or that they used wild flax in linen manufacture. They also exploited hemp but, being coarser, it was more often used in the production of rope and sails. Hemp appears with reference to textiles by about the 5th millennium BC on Neolithic sites of the Yangshao culture in northern China but does not appear certainly as a material of textile production in the West until about the 1st millennium BC. Nettles could also be employed in the production of textile fibres although solid evidence for their use generally dates to no earlier than the 1st millennium BC.

Now what is most remarkable is that sheep and goat were already domesticated some 10,000 years ago, possibly earlier. In chronological terms, it means that across Eurasia for a period of several thousand years shepherds, themselves dressed in clothes of plant fibres, stood about tending their flocks of sheep and goats. Were they missing something obvious?

Not really. Although our image of a sheep may be that of a woolly quadruped (or for those who occasionally have to evict sheep from archaeological excavations, an incredibly stupid woolly quadruped), early Neolithic sheep were not at all woolly but covered with short, thick, coarse hairs or kemp.

The coat on a sheep thus looked about as inviting for the production of woven textiles as that of a deer. The replacement of the coarse short kemp by a woolly coat was a process that apparently began about 5000 BC and woolly sheep did not become widespread in Eurasia until c. 3500 BC. The earliest appearance of woolly sheep is generally thought to have been in Iran and neighbouring territories from which it diffused east and west. In addition to the shift from kemp to wool, there was also a loss of pigmentation which would eventually result in purely white sheep (and wool). This provided a useful chronological marker in the history of dress: before c. 3500 BC we can normally expect and do encounter skins and plant-based fibres, and...
after this period we find increasingly greater quantities of woollen textiles. The archaeologist works to a three-age system: Stone, Bronze and Iron; for the history of textiles it is the same although the periods do not correlate with those of the archaeologist: Skin (?-5000 BC), Linen (6000-3500 BC) and Wool (3500 BC onwards).

The production of woollen fabric may be achieved by a variety of methods. Technologically, the simplest way is by felting. This only requires that one take the animal fibres, such as wool, and lay them out in the shape desired. Then you wet the fibres with warm water or whey, which enhances the ability of the scaly fibres to tangle with one another. Then apply pressure — repeated beatings, crushing, kneadings, whatever it takes to fuse the woolen fibres together into a coherent shape. If decoration is required, you can add small pieces of coloured material and subject it to the same rough treatment until it also has adhered. What you get is a textile that is water resistant and well insulated. Felt had many uses such as rugs, wall-coverings and tents, and hence it is very much associated with the pastoral peoples of the Eurasian steppelands. In terms of clothing, felt was typically employed in the manufacture of protective headgear and stockings.

When one considers the processes by which felt is made, there is a striking inevitability about the whole thing. Our earliest evidence dates to about 2600 BC, the date assigned to a felt rug discovered on the floor of a shrine at Beycesultan in Anatolia. Given the fact that sheep would have to be occasionally penned up and that they would naturally shed some of their coats, it would have only been a matter of time before they would accidentally trample some of their wool into a form that could occasionally be gathered in sheets to be fashioned into coverings such as hats, caps, small rugs, etc. Felt was an almost inevitable consequence of keeping woolly sheep.

The main alternative to felting is weaving on a loom. This requires the weaver to set the threads into a fixed grid, thus forming the warp of the loom. Over and under these threads, in a variety of combinations, would run the threads of the weft. Among the enormous varieties of weaving patterns, there are two that we must pay particular attention to.

The simplest form of weaving, plain weave, or tabby, requires one only to pass the thread of the weft over and under each of the warp. Such a pattern is as old as the earliest evidence for the weaving of (plant-made) textiles around 7000 BC. A more complicated pattern can be obtained in the production of twill. This involves, ideally, there are variations on the theme), running the weft over two and under two of the strands of the warp but alternating the pattern each row so that it is offset one place. This results in a diagonal rib or alignment of the weaves. The fabric is not simply visually different from plain weave but because the weft hops over two (or more) rows of the warp, it yields a denser fabric. Twill is almost invariably found associated with wool and not with linen. The earliest evidence for twill is from Anatolia and dates to the 4th millennium BC. This is followed by evidence from the Caucasus in the early 3rd millennium BC and then, after a considerable chronological gap, we recover evidence for twill in the Hallstatt culture in Austria (c. 1100-450 BC) and about the same time in Ferghana, the land of the ‘blood-sweating horses’, one of the western approaches to the Tarim Basin.

Silk and Cotton

The fabric synonymous with China, silk, derives from the silk worm (Bombyx mori), which is killed by heat within its cocoon so that the silk threads may be extracted before the moth breaks through the strands as it emerges from the cocoon. The earliest remains of such cocoons in an archaeological context come from the Yangshao, the north Chinese Neolithic culture, c. 5000 BC, but the earliest actual evidence for silk dates to c. 3300-2250 BC. When silk is first mentioned on an oracle bone from the later part of the Shang dynasty (c. 1200 BC), it is to become so abundant and well developed that one must presume a long tradition of prior evolution. The Chinese aristocracy kept the technique of its manufacture secret under penalty of death, yet silk is encountered in the West in Iron Age contexts dating to c. 600-50 BC and from Pazyryk in the Altai Mountains by about 300-250 BC. We have already seen how Han imperial policy employed silk as a bribe to hold off the depredations of the Xiongnu in the first centuries BC. The technique of boiling the cocoons to obtain the unbroken silk fibre from domesticated moths did not reach the West until the 6th century AD and the earlier discoveries of silk in the West, especially those prior to the opening of the Silk Road, can perhaps be explained by the exploitation of wild silk worms. A possible exception to all this is the development of silk in India, which may predate any putative contacts between it and China.
Finally, brief mention should be made of cotton which was domesticated earliest in India sometime in the 3rd millennium BC (or possibly the 4th according to more recent evidence). It is found in the Indus Valley or Harappan civilization which maintained trading links all over Central Asia and also with Mesopotamia. Nevertheless, the appearance of cotton outside India seems to be relatively late and it does not generally appear on archaeological sites or in literary references beyond its homeland until the 1st millennium BC.

Armed with some rudimentary knowledge of textiles, we can now turn to the evidence of the Tarim Basin. We might emphasize that the evidence for textiles is not limited to the mummies but that much of our evidence also derives from burials where only the skeletons have survived.

Second Millennium BC: Qäwrighul

The earliest attested textile remains in Xinjiang were discovered at sites of the 2nd millennium BC such as the cemetery at Qäwrighul. As might be expected, the textiles from this period are the most primitive. There is no evidence for seams, piping, sleeves or trouser legs; dyeing is limited to very small areas of cloth. Generally, all woollen textiles are of felt or employ plain weave.

The 'Beautv of Korin' from the Towan River cemetery wore a woollen hood consisting of an underlay of two pieces of dark-brown woollen cloth covered by a weather-resistant felt overlay. Her mid-length skirt was made of leather with the fur turned to the inside for warmth and her cloak, which reached to her knees, was plain woven (with extra weft looped in) sheep's wool. Her boots were ankle-high moccasins. The other woman from the same period (c. 1800 BC) and the Chonchi River region wore a similar felt hood and her cloak was a golden-brown woollen wrap consisting of two strips of plain weave that had been stitched together (the loom employed seems to have been incapable of producing a piece of cloth wide enough to cover the woman). The child from the same graveyard was wrapped in a brown and beige woollen blanket. The proud mother or grandmother who wove this blanket could almost be accused of showing off as it is a tour-de-force sampler of different weaves which changed every few inches.

The textiles from Qäwrighul are more than a fashion statement. We may recall that the range of the wild sheep does not extend as far east as China and the earliest evidence for sheep in China dates to the 2nd millennium BC. The presence of woollen textiles in the Tarim Basin indicates that by the early 2nd millennium BC domestic sheep from the west (along with domestic wheat, possibly barley) had been introduced to the Tarim Basin. Whether it was introduced by the direct ancestors of the Qäwrighul mummies or not is impossible to determine, although the association of a western physical type of humans with a (more) westerly domestic livestock suggests just such a conclusion.

While we cannot be certain of the date of a number of other mummies, some from the same general region may also be discussed here. The mummy discovered by Bergman at a site near Lopnur, which he numbered Grave 36, also had a double-layered felt cap, pegged with two feathers on the left side and with ear-flaps that could be tied under the chin. The old woman in this grave was enveloped in a large dark brown woollen cloak trimmed with a yellow and red border and fastened together with wooden (and one bone) pins. Around her waist was a string skirt of red and undyed woollen fringes. Her shoes were of rawhide with an inner sole of lambskin.

Male dress of this period is more difficult to discuss unless we presume that the burials excavated by Bergman at Ördek's necropolis date to approximately the same period on the basis of similar ritual and finds (they may actually be much later). Even here we will not get very far. The mumified young man from Grave 5A, the best preserved of the burials, wore a white felt cap with ear-flaps and five feathers mounted on pegs; it was
fastened around his chin with a cord. This at least indicates that the 'Robin Hood' style of headgear was worn by both males and females, whether there was a more subtle 'gender statement' being made in these hats we cannot tell without a greater sample. Certainly unnoticeable was the fact that around his wrist he wore a narrow loincloth (only 5 cm (2 in) wide) which had been anchored to his pants. It was made out of wool as was also the large mantle (2.1 m by 1.55 m (6 ft 10 in by 5 ft 1 in)) which was wrapped around him. This unfortunately is the only piece of male outer clothing from the area.

As such a mantle may have served equally as a shroud, it is difficult to be certain how males actually dressed during this earlier period. Bergman did observe that the young man was shod with brand new moccasins of ox hide.

The 1st Millennium BC: Zaghunluq

The recently excavated mummies from Zaghunluq (near Charchan) indicate new techniques that had appeared in East Central Asia by the 1st millennium BC. The quality of the weaving had improved and now included not only plain weave but twill. The quality of the wool was also superior: it was a fine wool with little evidence of kemp.

To fit out 'Ur-David', the gentleman from Zaghunluq, we can start with his array of caps and hats (he had ten altogether). A very stylish beret-like brown hat was made by the technique known as 'nålbindning' ('needle binding' in the Scandinavian languages, made from a single piece of yarn), which gives the appearance of knitting. This is one of the earliest known examples of 'nålbindning' in the world. Another brown beret from Qizilchoqa has been analyzed by Chinese textile specialists as having been knitted; this too would be the earliest example of that technique in the world. Another hat of white felt and a mid-seam had a rolled piece of felt in the front to form two 'horns' (like a cartoon viking) and there were two flaps with braided strings for fastening the hat to the chin. Still another hat was made by sewing together two pieces of thick brown felt with neat stitches of white thread to form a very high (32.7 cm (1 ft)), rakishly tilted peak with a turned-up brim that is also edged with the white decorative stitches. His shirt was crudely fitted: it consisted of two rectangular halves of burgundy coloured wool that were draped over each shoulder to which were attached tubes to serve as sleeves; the fabric here was plain

weave with red piping along the seams. Also discovered in his tomb was a bulky, double-faced twill-weave sweater made of heavy cream-coloured threads; the sleeves would only have come down to the man's elbows and the low-cut, open neck was tied together with thread.

Below his waist the man wore a pair of woollen trousers and it might be noted that a pair of unaccompanied trousers were also recovered from elsewhere on the site. Seams as well as red piping were in evidence. He also wore a multicoloured belt (red, brown, blue, green and yellow) fashioned from woollen yarn. The concept of a five-coloured belt is reminiscent of the practice in India whereby brahmans wore and still wear a five-coloured (pataca-rāpa) thread over their shoulder. This belt, however, did not hold his trousers up but merely fastened the two sides of his upper garment. Doublet sleeves rose to his knees but it was his stockings that really caught the eye. They were double layered with robin-egg-blue felt underneath for insulation and bright-red and yellow woollen strips wound around the outside to create the loudest socks known in the prehistoric world, although they would have been entirely covered by his boots.

One more garment is to be associated with his dress - an enormous outer coat made of extremely thick brown thread which was set about 80 cm (2 ft 7 in) from the surface of the grave and served to protect the lower chamber of the tomb (ill. 128). On top of it was a whit felt blanket on which in turn were placed a leather saddle and a simple, round-based black jar. The saddle and trousers go together well: while Westerners may look to ancient Greece or Rome for the home of their philosophies, laws and literature they have adopted the costume of horse-riding barbarians who, for practical (and obvious) reasons, developed trousers.

It might be noted that the ancient Greeks mocked the concept of trousers, suggesting that close-fitting pants repressed the sexual abilities of their northern neighbours!
The woman accompanying 'Ur-David' wore a finely woven twill robe of dark red that reached to her calves. This was a marvellous garment, so perfect that it almost had a sheen and would no doubt fetch a large sum if produced today. Under her knee-high boots of white deerskin her left foot was wrapped in red wool flannel and her right in yellow and sky blue, a possible fashion statement that now escapes us (of course, textiles were 'women's work' so we must presume she had quite a bit of say in what was worn). One of the other women in the tomb wore a dark-red dress and her legs were covered with a yellow- or white? - dyed woollen cloth with red spirals. The excavator also recovered a blue shawl of loosely spaced plain weave with red stripes.

The infant buried next to this tomb, 'Baby Blue', with the fluffy blue bonnet and blue stones over its eyes, wore a red-brown plain-wear shroud or baby blanket which was then wrapped in a white felt blanket. The same beautiful, rich shade, probably achieved by applying red dye to brown wool, was found on the man's dress. Moreover, the same kinds of thick strings of twisted blue and red strands that bound the hands of 'Ur-David' to his chest were used to bind up the baby's wraps. This seems to be a family whose clothing was made by the same woman who, not unexpectedly, produced colour-coordinated textiles for members of the same family.

In the more recently excavated 'sacrificial' burials at Zaghrunluq (with the tripartite mature woman, the 'Scream Baby' and the mutilated younger woman), the mature woman wore a beautiful violet-purple upper garment and a coarsely woven greyish lower garment. The baby was dressed in an amazing brown shroud decorated with red strips on which were tie-dyed a series of yellow circles. A yellow woollen headband was employed to tie the baby's mouth shut (the family of 'Ur-David' used a burgundy strap).

Irene Good analyzed one additional piece of fabric from the Zaghrunluq burials. The extremely fine thread suggests the possibility of cashmere on the site and Good points out that goat skulls are associated with one of the Zaghrunluq burials. To this we might add a large quantity of spindlewhorls, some of which were ornamented with interlocking spirals.

Tartans at Qizilchoqa

Although dating to about the same period as Zaghrunluq, the cemetery at Qizilchoqa to the northeast near Hami yielded different weaves for which far-reaching historical connections have been suggested. The precise date of the Qizilchoqa cemetery is problematic: the initial dates placed it at about 1200 BC, contemporary with the later period of the Yanbulaq culture, but a new radiocarbon date of c. 800–530 BC suggests that it belongs to the later Tolt Tert (Sidaogou) culture. The abundant evidence for dress here revealed a variety of clothes, including woollen robes with coloured belt bands and fur coats (the fur turned inside) with integrated gloves, which fastened with wooden buttons (ill. 130). But our main story lies with the woollen textiles.
Irene Good made a detailed examination of a textile fragment (15 cm by 10 cm (6 in by 4 in)) from the site. The main weave was normal diagonal twill (pl. X) but the decoration involved the production of plaids, the same type of decorative technique one might expect on a Scottish tartan (pl. XI). This involved the weaving of wide and narrow colour- stripes on both the warp and the weft and here the colours employed were threads of blue, white and brown, each thread made up of some 30 to 40 fibres. The white and brown thread are natural while the blue thread is dyed. This small strip of cloth has been invested with heavy historical implications.

As we have seen, the earliest twills known derive from the region between Turkey and the Caucasus where they are dated to the late 4th–3rd millennium BC, and they are found in abundance from the late 2nd millennium BC in Europe, particularly at the site of Hallstatt. Here miners left residues of their clothing (and, occasionally themselves) in the protective environment of Austrian salt mines. As the Hallstatt culture occupied a territory which classical authors would associate with Celts only a few centuries later, it is generally presumed that the miners here (and the warriors and others buried in the neighbouring cemetery) were also Celts or Proto-Celts. The easternmost finds of twill, dating from the centuries around 1000 BC (or somewhat later), are the fragment from Qizilchoqa and many others like it from the same cemetery (some very Scottish looking); true twills are unknown in China until well into the 1st millennium AD. The Qizilchoqa twill is virtually identical to the textile fragments recovered from Hallstatt with respect to both style and technique (hence one of the arguments employed by the tabloid press for placing killed Celts in the Tarim Basin). We are not talking simply of the diffusion of a particular weaving and colour pattern. As Elizabeth Barber writes: “The regular combination of plaids and twills in the same cloth and the similar play of wide and narrow in the plaids move us into a border zone where it’s harder to imagine the sum total as accidental”. There is also a similarity in the weight of cloth. Of course there are differences between the Hallstatt and Qizilchoqa materials, for example, Hallstatt employed only two colours while the Qizilchoqa plaids used from three to six colours. In addition, there are even differences among the Tarim plaids. Irene Good has noted that the weaving traditions of Qaghu and Qizilchoqa are themselves considerably different even though they both date to the period before the middle of the 1st millennium BC. The Qizilchoqa (Hami) fragment appears to derive from a hairy rather than woolly fleece and would seem to come from a different breed of sheep than that found at Qaghu; there are also differences in the crafting of the cloth, e.g., the Qaghu twill involved hopping over three stems of the warp rather than the more typical two as found at Qizilchoqa. In weighing the similarities between the European and Central Asian material, Barber concludes that the two are related yet also makes it clear that neither is derived from the other. How do we connect the two textile traditions?

Elizabeth Barber has deduced that the twill plaid recovered from the northern Tarim may be placed within the context of Indo-European migrations. As we have already recounted, one of the most popular theories of Indo-European origins would locate their homeland in the steppes encompassing the Ukraine and southern Russia, a region which would have been in direct contact with the Caucasus whence we obtain some of our earliest evidence for twills. In this model, the earliest Indo-Europeans would have known plaid twill and carried it west into central and western Europe where it would later emerge among the Celts of the Hallstatt culture; it would also have been carried eastwards across the steppe where it would have been introduced by Indo-Europeans, here identified as the Tocharians, into the Tarim Basin.
The ‘Witches of Subeshi’

The cemetery at Subeshi, dating to about the 4th or 3rd century BC, yielded the mummies of three elegant women. Their attire is so similar that description of one will suffice (pl. VI, ill. 132).

The woman wore a sheepskin coat that reached to her calves. As is so often the case, the waterproof hide is turned out leaving the warmer fleece inside. Although the cloak has sleeves, the excavators found that it was placed only over her shoulders, and it is possible that her arms were never intended to slip through the sleeves. The custom of wearing one’s cloak over the shoulders was also widely known from Iran to China among the various nomadic tribes. Beneath the cloak was a kind of blouse, made from woven brown wool with long sleeves edged in red. Below this she wore a magnificent, eye-catching woollen skirt with horizontal stripes of yellow, red, blue and burgundy that reached to her ankles; it was fastened at the waist with a knotted cord of four colours (not unlike that found at Zaghanlug). Her feet were clad in leather slippers which had brown felt stockings attached. She wore a leather mitten on her left hand while her right was bare. But what attracts us most about her dress is her enormous funnel-shaped hat. Made of black felt, the hat rises a full 60 cm (2 ft) high and has a wide brim. Such an enormous pointed hat is, of course, quite in accord with the literary descriptions of those Saka who were distinguished by their large pointed harts, or Song Yun’s description of the wives of the Hephthalite kings who wore ‘a kind of horn 3 feet high’. From a Western perspective, the pointed hat looks uncannily like that worn by a witch (the witch’s hat, the tall, peaked or steeple hat of felt or beaver, derives from 17th-century Puritan dress). The women are generally presumed to have been either priestesses or royalty (or both).
Historical Period

In order to round off this account of the apparel of the Xinjiang mummies, we will extend our survey briefly to the first few centuries of the 1st millennium AD. It is roughly to this period that we may assign a number of the burials excavated by Folk Bergman near Lopnor Grave 10, for example, which contained the body of an old man, provided evidence for male dress in ancient Khotan in the centuries around AD 400. He wore a yellow-brown silk cloak with cotton trim; his sleeves were long, extending over his hands. His trousers were of sheepskin and reached down to just below the knees. He bore his leather boots, highest in the front and fastened with a strap that would be tied to the knee. Bergman observed that this was the same type of footwear depicted in murals of ‘Tocharians’ at Bezeklik. His socks were of felt. One of the most unusual objects, however, was a small painted felt doll of a woman that had been placed by his hip.

More recently an aristocratic couple have been excavated in the same grave (Grave 3) at Niya. Buried together in a coffin built of thick wooden boards, they were accompanied by vessels, a bow, arrows, quivers, legs of lamb and textiles. They both wore exquisite silk robes and hoods with colourful, ornate patterns. The robes, fashioned from the same material, were meant to match, but whereas the man’s robe was decorated with a checker-board pattern of blue and yellow squares, the woman wore a robe decorated with wavy yellow lines against a blue background.

From this brief survey of the evidence for the Tarim textiles we must admit that in terms of research, work has hardly begun. During recent rescue operations at Zaghrunluq in 1996, Wang Bo recovered 40 large boxes of textiles for the Urumqi Museum which will take years, if not decades, to examine and assess. As we cannot wait for the results of such examinations, we will see what light the evidence for language might shed on the Tarim textiles.

Schleicher’s Sheep

We have already introduced the subject of language in our survey and it is helpful to consider what stage in the development of textiles we might place the Indo-Europeans before they divided into their different stocks. With regard to sheep and wool, a convenient index of development can be seen in what is known in Indo-European circles as ‘Schleicher’s tale’. August Schleicher (1821–1868), one of the founders of historical linguistics, set himself an interesting exercise: he tried his hand at composing a short tale in the reconstructed Proto-Indo-European (PIE) language, a difficult task since it was not easy to find sufficient items of reconstructed PIE vocabulary with which to write a narrative. The plot of the tale was driven by whatever items of vocabulary were available and so in the year of his death Schleicher tried to deal himself as easy a hand as he could and stuck to some of the most widely attested words in the Indo-European lexicon. Below we tell the tale in Schleicher’s original version, then an updated ‘reconstruction’ by D. Q. Adams based on more recent linguistic evidence, and, finally, an English translation for those whose Proto-Indo-European has become a bit rusty.

Schleicher’s version (1868)
Avis, jasmin varna na a ast, dadarka akvams, tam, vaghram garun vaghatam, tam, bharam magham, tam, manu ake bharamat.

Avis akvabhis a vavakat: kard aghnatai mai vidanti manun akvams agam.

Akvabhis a vavakat: kard aghnatai vidibant-asas:
manus pati varam avsas karunati swabhijam gharman vastram avbhab bija va na ast.

Tat kaknuanta avis agram a bhugat.

Adams’ version (1997)
hyōis, kʰwesio gleiynēh4 te (hē) est, h₁jēktos spēket,&oacute;1 jōiōnem h₂gʷe dweōgam gēgbehtim jōiōnem; kʰwesio ngēmbh₃ bhōrom, jōiōnem kʰwesio gēgbehtim jōiōnem bēkū bhōrom.
hyōis tu h₁jēktos ibh₁i jōiōnem kʰwesio yeuk₁i est: kēr h₂gʷesio nō mōi h₁jēktos
h₂gʷesio jōiōnem dweōgam gēgbehtim jōiōnem. Kludihi, kēr gē h₁jēktos ibh₁i jōiōnem kʰwesio dweōgam gēgbehtim jōiōnem gē h₁jēktos ibh₁i jōiōnem.

Tōd Kēkludis h₁jēktos kʰwesio bhugat.

English Translation

A sheep that had no wool saw horses — one pulling a heavy wagon, another one a great load, and another swiftly carrying a man. The sheep said to the horses: ‘it pains my heart seeing a man driving horses’. The horses said to the sheep: ‘listen sheep! it pains our hearts seeing man, the master, making a warm garment for himself from the wool of a sheep when the sheep has no wool for itself.’

On hearing this the sheep fled into the plain.

Ignoring for the moment that Schleicher’s reconstruction presumes that a man rather than a woman, as ethnographic evidence generally suggests, was making the woollen garment, we can emphasize that Schleicher had no qualms about assigning ‘sheep’, ‘wool’ and a ‘garment’ to the Proto-Indoeuropeans. In other words, before the various Indo-European stocks had differentiated among themselves, the speakers of Indo-European shared a common vocabulary for sheep, wool and textiles. Let us try to establish how much the comparative linguistic evidence suggests they knew about textiles and how any of it might fit into the descriptions of the Tarim mummies.
Indo-European textiles

The sheep was known in Proto-Indo-European as a "błojis" and reflexes of its name can be found in Celtic (e.g. Old Irish of 'sheep'), Italic (Latin ovis 'sheep'), Germanic (e.g. Old Norse of 'sheep'), Old English 'fōs 'sheep' (whence we gain our word ewe), Baltic (e.g. Lithuanian ovis 'sheep'), Slavic (e.g. Old Church Slavonic ověš 'sheep'), Greek of(wo) 'sheep', Armenian bəw 'shepherd', Anatolian (Luvi̇an ḫâwui 'sheep'), Iranian (Wakhī yoes 'ewe'), Old Indic āvī 'sheep', and Tocharian B ȵə 'sheep'. To a generic word for sheep, we could also add "błojikhi gəw 'ewe', b̥̥er 'lamb', 'kid', possibly "(s)Rekōs 'sheep/goat', from the Atlantic to Greece we have "b̥̥eg̥̥enmos 'lamb' while from Greece to India we find "yēyare 'lamb'. Distinct textile associations can be seen in the reconstructed word "moisōs 'ram', 'sheep', 'fleece', 'skin' which is found in Baltic (e.g. Latvian mašs 'sack'), Slavic (e.g. Russian meki 'skin', 'sack'), Iranian (e.g. Avestan mašta 'ram') and Old Indic maśā 'ram', 'sheep', 'fleece', 'skin'. A derivative of this word is also known in Anatolian where Hittite maśta- means something like a 'bale of wool'. The actual word for wool in Proto-Indo-European is "głyby 'wool', which can be seen in Celtic (e.g. Welsh gwaf), Latin lana, Germanic (e.g. Old English wulfe), whence our modern English wool, Baltic (e.g. Lithuanian vilna), Slavic (e.g. Russian volna), Greek lýnos, Hittite indana-, Iranian (e.g. Avestan varāna), and Old Indic irda-. What we gain from these reconstructions is strong evidence that both sheep and wool were securely rooted in Proto-Indo-European culture and that of its daughter stocks. Given that sheep only begins to appear in China about the 3rd millennium BC and that they arrive from the west, it is at least suggestive that one of the vectors for their introduction may have been Indo-Europeans entering the Tarim Basin. The fact that the Indo-Europeans were also well acquainted with wool and that woolly sheep are largely a product of the 4th millennium BC suggests that the Indo-Europeans had not yet diverged linguistically from one another by that time. In other words, if we employ our textile-based three ages, then it is to the later Woolen Age (after c. 3500 BC) that we assign the Indo-Europeans. The one word that we have for 'linen' in Indo-European, 'linum', is confined to languages of the west and centre, i.e. Celtic, Latin, Germanic, Baltic, Slavic and Greek; it reveals no cognates among the Indo-European languages of Asia.

We know that the ancient Chinese must have received their domesticated sheep from the west, can we tell from whom? This is not at all easy – we have already seen some of the difficulties in working with ancient Chinese – but there is one possible linguistic argument to support this presumption. We have just seen that one of the Proto-Indo-European words for 'lamb' is "yēyare. Now the modern Chinese word for the sheep or goat is yēyāng and it occurs earliest in the Shang dynasty (1200 BC, roughly contemporary with the later Bronze Age occupation of the Tarim Basin) where the sign employed for 'sheep' looks like the head-on face of a sheep with its curved horns on top and pointed chin below. The character is also associated with a series of other characters conveying felicitous meanings, e.g. 'good', 'beautiful', an interesting association in that Chinese agriculture did not favour herbivores (lack of suitable pasture) and yet appears to have regarded sheep as a 'good' thing. Now yēyāng seems far removed from the Proto-Indo-European form but we should remember that the eastern Indo-European languages, such as Sogdian wēn 'lamb', derive from an earlier Iranian form 'warīna' while the cognate Tocharian word yīyē 'lamb' would come from something like "wara'-. And the earliest Chinese form that we can reconstruct for this word is "yēyāng which might just derive from some Iranian or Tocharian form for the word.

We have by no means exhausted our evidence for Indo-European clothing but rather than getting entangled in a web of linguistic forms, it is more convenient simply to list the different roots, their probable meanings, and their distribution, in a table (pp. 226–227).

Altogether we have about 42 roots or words that have a close association with textiles. Of these, we find cognates in the Asian languages of Iranian, Indic and Tocharian, the three language stocks also represented in East Central Asia. We need to keep our eye on these since it has long been observed that some words that are found among various Indo-European stocks cannot be assigned to the earliest periods of Indo-European antiquity. For example, we can see that the root "rum- is really only found among two language stocks, Celtic (actually Gallo-Roman) and Germanic, and is most likely a late regional term for a cloak or mantle in western Europe or a borrowing from some 'native' language; we would have no reason to suggest that any of the Tarim mummies used this root in describing their own clothing. Each word, depending on its distribution and shape, must pass some form of test concerning its antiquity. Although somewhat rough and ready, a widely accepted test is to demand that a cognate word appear in both a European and an Asian language.

So, what does our linguistic evidence tell us about what the Proto-Indo-Europeans knew about textiles (and they may have known quite a lot more even if we can't prove it from the linguistic evidence)? The chart indicates that the Indo-Europeans had combs, plucked/pulled out (wool), could make thread, could spin the threads and both plait/brand and sew. They could also clearly weave and dye, and had woad for dye. The word for 'clothes', 'cloak', 'drape', seems to come from a root "drear 'split', 'tear off' which suggests that its antecedents rested with animal skins rather than weaving. This could be an old word and we might recall that among the earliest Tarim mummies, those recovered from Qawrighul, cloaks of animal skins occur frequently enough. Cognates for getting dressed are well represented and the clothing could include both a belt and some form of headband. Cognates for the word for 'shoe' are confined to the centre and west of the Indo-European world. The root, "khrapia, is generally derived from the verbal
### Indo-European terms for textiles and clothing

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<th>Proto-Indo-European</th>
<th>Meaning</th>
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<td>*(sim)εsβ₁l-</td>
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<td>*keek-</td>
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### Other terms

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<td>*top-</td>
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<td>*ug₂p-</td>
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**Total cognates:**

| 14 | 20 | 35 | 26 | 19 | 6 | 26 | 7 | 7 | 15 | 21 | 11 |
root "(s)kēr, 'cut' and it is presumed that this indicates a shoe cut out from leather (as we find in the Tarim Basin) rather than one from tree bark (as worn by the Tyrolean 'icemen').

What about knowledge of felting? The linguistic evidence here is not impressive and is largely confined to cognates in Latin (pilīna), Germanic (e.g. Old English felt), Slavic (plásti) and Greek (pillos). The word is clearly related to PIE *pilos 'a single hair on the human body' and it may not have been PIE but reflect a somewhat later spread of a word and technique among Indo-Europeans in Europe. The only other word connected with felting is a verb (*nēk-) which is found in Greek as nāsso 'press', 'compress' and zā nākātī 'felt shoes'. But in other languages such as Hittite it means 'weighty', 'important', i.e. 'pressing'. This suggests that the meaning of the word may have gravitated towards felting in Greek (and possibly Latin where nāsca 'cloth-fullers' may be cognate if not derived from Greek) but that we really cannot claim that this was the original meaning in Proto-Indo-European. Given that felting probably preceded weaving as a technique, it seems odd that we cannot reconstruct a word for 'felt' in Proto-Indo-European. But the evidence for the proto-language is patchy, and terms for felting may have dropped out among many Indo-European groups. What is striking is our inability to obtain a cognate from Indo-Iranian although their probable steppe ancestors should have excelled in the production of felt and should have been one of the main vectors for bringing felt to the Tarim Basin.

While we have solid evidence that the Proto-Indo-Europeans knew weaving, the reconstructed vocabulary offers no additional evidence as to the appearance of the Indo-European loom; it may well have been a simple band loom, which can be hitched up wherever there are two convenient places to bind the ends. This would generally produce fairly narrow bands of cloth or belts (as we find associated with the earliest Tarim mummies). Our inability to reconstruct any form of loom contrasts with our knowledge of wheeled-vehicle parts whereby we can reconstruct words for 'wagon', 'wheel', 'nave' and 'thill' or 'pole'. This need not prove, however, that the Indo-Europeans lacked the loom although Elizabeth Barber has pointed out that all words associated with the warp-weighted loom in ancient Greek were either borrowed from another language or had to be re-created in Greek.

Drawing the Threads Together

If we take all of our evidence together, we can make the following observations:

On the basis of the linguistic evidence relating to textiles, the speakers of Proto-Indo-European, the language family presumably ancestral to the Bronze Age populations of the Tarim Basin, began to expand 1,000-2,000 years before our earliest evidence for Tartars in the Tarim Basin. The Tartar populations were not Proto-Indo-European but could have belonged to some subsequent period of Indo-European linguistic evolution.

It is probable that Caucasian populations, either across the steppe or through the Tarim Basin, introduced both sheep and wool to the region where they were adopted by the Chinese. It seems just possible that the Chinese may have borrowed their word for 'sheep' from some form of Iranian or Tocharian language.

Although we can broadly describe the vocabulary of textiles reconstructable in Proto-Indo-European, we cannot define the subsequent stages of textile development among the most easterly Indo-Europeans, the Tocharians and Indo-Iranians.

The earliest stages of textile development witnessed in the Tarim Basin are basically confined to headgear, shoes and some form of blanket or cloak; this may reflect the basic apparel of the population but it might also be governed entirely by ritual requirements (we seldom dress our own dead in tracksuits, swimming trunks, clown outfits, casual wear, etc.). One thing we can say about the clothes is that the dependence on woollen textiles conforms with a western or northern entry into the region.

Subsequently, about 1000 BC, we begin to find evidence for twills (a technique that, so far, our lexical evidence tells us nothing about). And by c. 800-500 BC we find plaid. We could follow Elizabeth Barber who suggests that twills began in the region between Anahita and the north Caucasus and then spread east and west. But what about the specific correspondence between the European and Tarim plaid or tartans? Here we are in the embarrassing situation of suggesting that the extremes of our comparisons, Hallstatt and the Tarim Basin, are more similar in both production techniques and in final product than the areas in between. One is tempted to argue that only a direct historical connection (migration) between Europe and the Tarim Basin c. 1000 BC can possibly account for the similarities. Alternatively (and more circumspectly if we want to hang on to an academic reputation), we can admit that we simply do not know what types of textiles were worn in between these two distant outliers and be suspicious of any attempt to draw an arrow from Hallstatt to Qishichoq. New discoveries may support this thesis but the history of archaeology is full of cautionary tales where scholars, mesmerized, for example, by similar spirals found in Bronze Age Greece and elsewhere, had no difficulty sending Mycenaeans all over Europe to introduce their spirals and, more amazingly, sailing back several thousands of years to acquaint Neolithic populations with the motif (before radiocarbon dating you could get away with truly amazing theories). The evidence of textiles is particularly fragmentary—the discovery of cloth depends on very specific environmental conditions and so we have to take into account that our evidence is distributed unequally in time and space. Barber's suggestion of a common source for both traditions at least splits the geographical distances involved and also places a distant origin on the cusp of two vast spheres of interaction. But if we want to get any closer to their origins we will have to strip the mummies not only of their clothes but also their skin and examine what their bodies can tell us of their origins.
Skulls, Genes and Knights with Long Swords

While the number of mummies from the Tarim Basin is impressive, they are still only a small proportion of the human remains from prehistoric East Central Asia. They are also relatively unique, and without a chain of compatible mummies across Eurasia, they do not in themselves leave a trail that the archaeologist can easily follow. If we wish to trace the origins of the different peoples of the Tarim Basin we will have to make recourse to other evidence as well. For the prehistoric period we have the evidence of human skeletal remains and the new and developing field of 'molecular archaeology', the use of DNA in the study of ancient populations. Both of these help tell us where the mummies came from. We may also review the iconographic depictions of the historical populations of East Central Asia, particularly those produced before the Uyghurs absorbed the previous populations, in order to examine the appearance of the earliest historical descendants of the mummies in East Central Asia. Finally, we look to the modern population of the region to see if the genetic legacy of the mummies still survives.

Faces of the Past

The majority of mummies and human skeletal remains before the Han conquest of the Tarim Basin are of a Caucasoid physical type rather than Mongoloid or, as Chinese specialists might put it, they represent the 'minority' population of Xinjiang rather than the Han, the Chinese name for their own ethnic group. We have also seen how many of the mummies still retained their light-brown, reddish or even blond hair. But to take the description any further, we have to resort to the language of the physical anthropologist. The 'Beauty of Krorian', for example, whose hair was yellowish brown, possessed a face of 'medium flatness with prominent zygoma and high nasal bone', in other words, her face was relatively flat, her nose high and her cheek bones were prominent. In terms of her skull, her features exhibited 'mesocranian, euryprosopy leptorrhiny', i.e. the ratio between the length and breadth of her head fell in the middle (neither long-headed nor broad-headed), her face itself was broad and her nose was thin.

The best preserved of the mummies from Qizilchao, another reddish-brown-haired female (and clearly not of the Han), similarly had the prominent cheeks and high nose of the foreigners, i.e. Caucasoids. The shape of her skull, however, was dolichocephalic, i.e. long-headed, and mesocrinion, i.e. she had medium sized orbits.

This, amazingly or disappointingly enough, is about as far as the physical appearance of the mummies goes in telling us of their ancestry or relationships. Unless there are populations similarly preserved over Eurasia, the mummies, no matter how well preserved, can tell us little of their origins. The irony is that their preservation actually obscures their more specific relationships: we may learn more when we undress them of their flesh.

Cranimetry

The study of human skulls occupies a peculiar place in modern anthropological research. The rise in interest in human evolution and race in the 19th century prompted detailed analyses of the human skull. Like any object of biological study, it was seen that there were variations in the size and shape of the skull, some of which appeared to fall into a pattern with respect to time or geography. Particular interest concentrated on the overall relationship between the length and breadth of the skull. A ratio, the cranial index, involved dividing the length of the skull into the (obviously smaller) breadth of the skull and then multiplying by 100 (to remove the fraction). If the value was less than 75, the individual was determined to be 'long-headed' (i.e. dolichocephalic if living or dolichocephlic if based on measurements of the fleshless skull) while a ratio of greater than 80 was labelled 'broad-headed' (Brachycephalic/brachycranian). Individuals whose cranial index fell between 75 and 79.99 were classified as 'medium-headed' (mesocephalic/mesocranic). This permitted one to divide all human skulls into one of three categories (actually, you could also be a hyperbrachycephalic 'fat-head' when the ratio was greater than 85). Examination of modern populations or the excavation of various cemeteries revealed that these dimensions were not entirely arbitrary but that often a group of skulls from the same cemetery and period or modern population would be relatively homogeneous. It was, therefore, presumed that such measurements were an adequate reflection of sub-racial types and could be employed both to define and trace the ancestry of different populations.

Further refinements of such simple measurements were made where other characteristics were taken into consideration and this resulted in a more overtly ethnic classification of physical features and skulls into different
types. Already in the late 18th century J. F. Blumenbach introduced the expression Varietas Caucasian, i.e., Caucasian, in the 3rd edition of his De generis humani varietate nativa liber (1795). He thought the people of the Caucasus to be the most beautiful subgroup of humans, the Caucasus to be the source of human origins and expansions, and that the skulls of the Georgians who occupied this region fell midway between those of the extremes, the Mongolians and the 'Africanians' of Africa. The Caucasian or Europoid could be defined as a whole suite of physical characteristics, e.g., small face with respect to size of brain case, long in proportion to breadth, small zygomatic bones, outer edges of orbits well demarcated, deep mandibular fossa of the temporal bone. The Caucasoids were subsequently divided into a series of more than a dozen subtypes, e.g., Nordic, Alpine and Mediterranean, Nordics were dolichocephalic, their nose was leptorrhine (narrow) and male stature averaged 1.73 m (5 ft 8 in); Alpines were brachycephalic, their noses were mesorrhine (medium-wide) and males averaged about 1.65 m (5 ft 5 in) in height. The Soviet leader Nikita Khrushchev was an Alpini while Lord Kitchener, who graced so many British army enlistment posters of the First World War, was sternly and typically Nordic.

The problem with this approach became self-evident once the physical anthropologists undertaking such measurements came to draw historical conclusions. A single cemetery might reveal a variety of skull types and, while the archaeologists might find cultural uniformity across the cemetery, the physical anthropological report read like the description of a soretr at the UN. It appeared to archaeologists as if the skull measurements of the anthropologists were arbitrary and fixed categories that did not impart any particularly useful historical information. Imagine for a moment that human stature had been divided into three categories: tall = Watussi, small = Pygmy, and medium = Syrian. When informed that analysis of the stature of 100 British burials resulted in 40 per cent Watussi, 30 per cent Syrians and 30 per cent Pygmies, the archaeologist would be bewildered with the historical implications of such information. But that the physical anthropologist was not working with historically meaningful categories coupled with a general avoidance of anything that smacked of 'racism' since the Second World War resulted in a cleavage between archaeologists and those physical anthropologists who sought to identify sub-races of populations. This was considerably exacerbated by the attempts of anthropologists and geographers, the latter undergoing a phase of cartographical mania, to seek correlations between skull shape and just about anything else that might be measured or plotted on a map. For example, dolichocephalics were shown to be more likely to divorce or commit suicide (not just in Sweden but even in France), and various schools argued over the relative intelligence of the different physical subtypes.

If it were not for the atrocities perpetrated by 20th-century racists, the history of research concerning the cranial index and the Indo-Europeans would be a subject of pure amusement. Scientists argued violently through the 19th and early 20th centuries about whether the ancient Indo-Europeans were dolichocephalic Nordics or brachycephalic Alpines. The overtly racist George Vacher de Lapouge, for example, was able to boast that the dolichocephalic Indo-Europeans were cultivating wheat 'when those of the brachycephalics were probably still living like monkeys'. Alternatively, the Australian-based geographer, Griffith Taylor (1880–1964), found the cranial/cephalic index a sure guide to human evolution and the emergence of increasingly more progressive races and languages. With Taylor, one might read the cephalic index as an indicator of progress: the higher the index, the superior the brain. Hence, it was the Chinese with their brachycephalic heads who were the most progressive and spoke the most progressive language (not a clumsy, infection-ridden Indo-European language). Among the Indo-European languages, Taylor could also correlate the progressiveness of the language with its speakers' cephalic index. At the top end of the scale were the brachycephalic Indo-Iranians and Armenians and at the bottom were the dolichocephalic Tocharians and the Celts (with Welsh scoring slightly more than Irish). With such egotistical excesses, it is hardly surprising that the cephalic index became an object of ridicule and Colin Renfrew could write: 'Cranio-metry, the study and measurement of human skulls, has in recent years enjoyed about as much prestige in scientific circles as phrenology [i.e., the determination of a person's character on the basis of his or her skull shape]. Renfrew's statement is probably an accurate description of the attitudes of many archaeologists although it might be emphasized that archaeologists are as

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<td>(Dolichocephalic)</td>
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<td>Galcha</td>
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<td>85</td>
<td>Armenian</td>
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there have been numerous investigations of living populations (comparisons between parents and children, between twinned and non-twinned siblings, etc.) that have attempted to isolate those facial features that are due to genetic inheritance from those that may depend on diet, environment or some other factor. Modern biological anthropologists have abandoned the approach of employing fixed subtypes for population genetics that accommodate the known evolutionary forces of natural selection, mutation, gene flow and genetic drift. Generally, any physical anthropologist engaged in assessing a population selects a series of measurements that he or she regards as most meaningful to a particular study.

The problem of verification is obviously difficult: the only way to determine whether skull measurements do provide useful genetic information is to trace skulls of known genetic relationships over a period of many generations. There are not many opportunities to do this; most modern populations tend to resent having their parents, grandparents, and so on exhumed in order to have their skulls measured. Fortunately, there are occasional situations where this is not such a problem. The village of Hallstatt in Austria which provided us with our evidence for ancient twill and early Celts, also practised an unusual way of disposing of their dead. Over a period of generations, the inhabitants of this mountain community exhumed the skulls and long bones of their relations, bleached their bones, and decorated the skulls with painted flowers before placing them in a charnel house. What is most important is that they not only decorated the...
skulls but also inscribed them with their names which can then be related to parish registers to provide about five generations of individual families. Examination of these skulls, both with respect to absolute measurements and non-measurable surface features, has indicated that such techniques do correlate with the genetic relationships of the inferred. Similar tests have been applied to other animals (mice and macaques) and good correlations between the evidence of physical anthropology and genetic relationships have again been observed.

Once a full array of measurements has been taken from each individual in a cemetery, the averages can be calculated and compared with those from other cemeteries or cultures. Statistical techniques then permit one to assess the relative affinities and differences among population samples. Such results can, at least, be intuitively plausible as may be seen from a recent dendrogram drawn up by Brace and Tracer (ill. 136). We should hardly be surprised that modern Norwegians and modern Faroese are closer together than to anyone else since they are also closely related geographically and linguistically. So also are the modern English and Irish, or modern Swiss and ancient Gallo-Romans. On the other hand, it also throws up relationships that simply will not do, e.g. the close relationship between Neolithic populations in Russia and Portugal makes absolutely no (pre-)historical sense at all. So, despite the impressive list of measurements and statistical techniques, it is still possible to obtain results that lack any historical meaning. With this caveat up front (and more to follow), we can look at the application of such techniques to the prehistoric populations of East Central Asia.

The Paths of the Skulls

Although some analysis was made of the skulls collected by Sven Hedin and other early explorers, only about 20 were examined employing the more archeological techniques of analysis that we have discussed above and, appropriately enough, with corresponding results, e.g. 11 skulls collected from the Lopur region were separated into Chinese, Nordic and Alpines. The more recent excavations, however, have yielded much more material and now we have 302 skulls from more than nine cemeteries which have been examined in detail by Han Kangxin of the Institute of Archaeology in Beijing. We can summarize his results in tabular form (p. 237).

The Qaqbrughal remains are relatively homogeneous and they exhibit features associated with a type known as Proto-Europoid, a rather robust Caucasoid, especially well represented in Northern Europe and the steppelands and forest-steppe of Russia and the Ukraine. Similar remains occur in the Bronze Age cemeteries of southern Siberia, Kazakhstan, Central Asia, and the Lower Volga. Anthropologically, Hans found the closest relatives of the Qaqbrughal burials in the cemeteries of the Afanasevo culture (of the Yenisei and Altai region) and the Andronovo culture that spanned Kazakhstan and reached southwards into West Central Asia and the Altai. These comparisons are absolutely critical since they relate the earliest mummies to Bronze Age populations geographically proximate, whose own ancestry can be traced back earlier than that of the mummies.

The next oldest remains derive from the Yanbulak cemetery near Qurnul (Hami), situated to the northeast of Qaqbrughal and the easternmost cemetery investigated. Here Han Kangxin identified 21 of the 29 complete skulls as Mongoloids and these are the earliest definite evidence of Mongoloids in East Central Asia. Their physical type, incidentally, was not that typical of the Han, the ethnic Chinese, but of the populations of eastern Tibet. The remaining skulls, however, belonged to Caucasoids who are closest to those from Qaqbrughal and point to the same general direction for their origin, i.e. the steppelands to the north and west.

The single skull recovered from among the inhumation burials at Shambabay near Tashkurgan in the far west of the Tarim Basin has been compared with the type that spanned the Mediterranean across Central Asia; this type also includes the Saka tribes of the southern Pamirs.

A much larger sample of 38 skulls was recovered from one of the mass graves at Qaqbrughal in the Tangri Tagh (Tian Shan). Here Han distinguishes
137. The three types of human cranial variation in Xingjiang according to Han Kangxin:
1 = Proto-Europoid
2 = Pamir-Fergana and
3 = Indo-Afghan.

Not too distant from the Alwughul cemetery and still along the southern slopes of the Tangri Tagh is the cemetery complex of Charwughul. At Cemetery IV the 77 skulls recovered were regarded as less robust forms of Proto-Europoids. Examination of the skulls also indicated widespread reparation. This refers to the rather radical medical practice of drilling holes, here on the order of 1 to 2 cm wide, into the skulls. Such operations were performed on occasion several times, presumably to relieve the pressure of the brain or some mental disease, and from traces of healing of the bone around the apertures, it is clear that, sometimes at least, people survived this widespread operation.

The burials recovered from Mongol Kūrān, since they are located on the upper reaches of the Ili River and date to the centuries on either side of the Christian era, are generally identified with the Usun and Saka. In so far as anyone can distinguish between these two historical groups archaeologically, 11 of the 13 skulls are assigned to Usun burials and only two are Saka. There was variation between the skulls, among which two female skulls displayed definite Mongoloid features, but in general they could be assigned to the same Pamir-Fergana type also seen at Alwughul.

The Sampul cemetery provides us with our only physical anthropological evidence of the southern Silk Road in the vicinity of Khotan. Although the cemetery contained various individual graves employing some form of log coffin, all the burials examined derive from the group graves which date to the first centuries BC. Han Kangxin has identified the remains as belonging to the same Indo-Afghan type that one encounters among the Saka of the southern Pamirs.

The half-dozen burials from a cemetery in Khoran provide interesting evidence for changes in the area around Lopnor where we earlier encountered the Proto-Europoids from Qāwughul. Now, at this later period the physical features, like those from the Sampul cemetery to the west, are Indo-Afghan and again related to the Saka of the southern Pamirs.

Finally, the 11 burials from Charwughul III have been assigned by some scholars to the Xiongnu and date from the first centuries AD. They have been described only in the broadest terms as Caucasian with some non-Caucasoid traits. Moreover, three of the skulls had been artificially deformed with markedly raised foreheads produced most likely by binding the skull at infancy until it had assumed its tall elongated shape. This practice was widely known among different populations of the Eurasian steppe: it probably defined the local group's concept of beauty and also marked them off ethnically from their neighbours. Artificial skull deformation is known in the steppelands from about 2000 BC among the late Yana and Catacomb peoples north of the Black and Caspian seas where it can constitute up to 70 per cent of the skeletal populations of some regions. Skull deformation is widely known later in the Iron Age where it occurred among the Alans and Huns. As we have already recounted, skull deformation was also practised in Kucha during the 1st millennium AD.
Who’s on First?

As no undisputed human remains have yet been uncovered from the Stone Age of Eastern Central Asia, we can only say nothing about the original population of the Tarim Basin. We can only emphasize that so far, the archaeology of the region admits certain evidence of extensive occupation in the Bronze Age but does not exclude the possibility of earlier settlement.

The variability of human remains recovered from Bronze and Iron Age cemeteries suggests, if one adheres to the typological approach employed by Chinese physical anthropologists, several different population groups in prehistoric Xinjiang. These groups have been divided into three groups of Caucasoids: Proto-European, Indo-Afghans, Pamir-Ferghans; as well as two groups of Mongoloids: eastern Tibetan and Han (ethnic Chinese).

So far, the earliest physical evidence has been identified as conforming to a rather robust ‘Proto-European’ type. Han Kangxin has recorded such traits from Qawrighul, Yanbulaq, and Charwighul IV. He has also attempted to place the Qawrighul population within the larger picture of Eurasian populations by comparing Qawrighul males and females separately with 24 other populations on the basis of the ratio derived from cranial and facial indices.

Among males, the ratio provided by these indices produces a tight cluster of samples possessing similar values. Members of this cluster include

138: The distribution of physical types in Xinjiang according to Han Kangxin.

Qawrighul males, males of the Afanasevo culture of the Minusinsk Basin and the Altai Mountains, and males from the Yamna and Srubna cultures of the Russian steppelands. Before the excavations at Qawrighul, these last cultures were long regarded as a closely related unit to which one might also add the Sredni Stog culture of the Dnieper-Don region. The relationship had its difficulties. Not with the Sredni Stog, Yamna and Srubna cultures that represented a succession of cultures between the Dnieper and Volga c. 4500–1200 BC, but with the inclusion of the Afanasevo culture. For the...
Afanasovo culture occurs at an enormous distance (c. 1500 km (931 miles)) to the east. Nevertheless, it was generally presumed, on the basis of the evidence of physical anthropology and an impressive suite of economic and cultural features, that the Afanasovo culture represented an eastern outlier of the European steppe cultures that expanded to the east sometime during the 4th to early 3rd millennia BC. That this movement may not have halted at the Altai but extended southwards into the Tarim Basin had been previously suggested on the most fragmentary of archaeological evidence (surface finds of pottery recovered by Aurel Stein that bore vague similarities to Afanasovo pottery). Han's suggestion that there was an intrusion of human populations from the north into the eastern Tarim would seem to be the most economical solution if indeed the males recovered from Qâwîrghul may be identified as the earliest Europeans in Xinjiang. That the physical remains from Qâwîrghul and Chârîwîrghul V remain unmixed with Mongoloids suggests that these robust Caucasoids were the first to arrive in the Tarim. Mongoloid populations lay still farther east and only begin to appear in the later 2nd millennium or early 1st millennium BC at sites such as Yanhuotai, predictably enough the easternmost of our Xinjiang cemeteries. It is difficult to say whether the Mongoloid settlement of the eastern Tarim represented an actual push of Mongoloid populations into East Central Asia or whether they had been established there long before. We have already seen that all the physical remains from neighbouring Gansu have been Mongoloid. Han Kangxin emphasizes that of the 302 skulls assembled for his survey of the prehistoric burials of Xinjiang, only 11 per cent belonged to Mongoloids, the major movement of Mongoloids into the Tarim Basin dating to the Qin and Han periods which coincides roughly with our historical evidence for Chinese expansion. Of the later Caucasoid types, we find that the Indo-Afghan or Eastern Mediterranean physical type appeared in the late 1st millennium BC at a series of sites stretching from the southern Pamirs (Shambabay) along the southern Silk Road to Khoto (Sampul) and then on into the Lopnor territory where Proto-Europoids were previously attested. This physical type is closest to that of the southern Saka whose remains have been identified in the southern Pamirs since about the 6th century BC. It has more distant ties with the agricultural populations of Central Asia (inferred from archaeological evidence but until recently unsupported by biological testing).

The third group of Caucasoids is the Pamir-Fergana type whose greatest similarities lie among populations to the north of the Indo-Afghans, i.e. the northern Pamirs and Ferghana. Their remains are largely concentrated along the southern border of the Tângri Tagh (Alwighul, Mongul Kurâl) or in the upland regions of the Ili River. While one may point to probable ancestors of the Indo-Afghan type, it is not so clear with the Pamir-Fergana. Some scholars consider them to be a mixture of Proto-Europoids with the Indo-Afghan type. As we have seen, the two types do come together in the cemetery at Alwighul.

Following the most recent analysis of Han Kangxin, the general picture then suggests an initial colonization of East Central Asia from the northern steppelands by Proto-Europoids with a later push westwards by Mongoloid populations. A second movement of Caucasoids of the Indo-Afghan type can be traced along the route from the Pamirs across the southern route of the Tarim Basin as far as Lopnor. This type is also found in some sites to the north where we encounter the Pamir-Ferghana type in the late 1st millennium BC.

We have described the results of Han Kangxin's analysis as an economical explanation as to what happened in the Tarim Basin, but is this model entirely justified? As we observed above, the typological approach that discusses population movements in terms of fixed sub-racial types is dismissed by the majority of biological anthropologists in the West who require that their results be supported by more rigorous statistical procedures. In a perfect world we would expect that any attempt to trace the relationships of the Tarim populations would employ the analysis of a larger number of pre-selected measurements and that these would include a much wider range of populations than was employed in Han's study. For example, the figure that places Qâwîrghul in a cluster of steppe populations should be tested against a larger number of potential 'relations' (we should not be overly surprised if Qâwîrghul is closer to the steppe populations when many of the foreign samples being compared belong to steppe populations). We need to open the analysis up and employ a much
wider range of 'Caucasoid' populations from the neighbouring regions and a greater number of measurements and then put them through more robust statistical scrutiny. The absence of comparable measurements across a large number of samples makes this impossible at the present but at least a start has been made.

For the past four years Brian Hemphill of Vanderbilt University has been examining the population dynamics of societies in West Central Asia and the Indus region, two of the areas that potentially could have populated the Tarim Basin with a Caucasoid physical type. He has only recently expanded his studies to include several of the samples from the Tarim Basin, specifically the sites of Qwirghul, Alwighul and Krorain. Here nine measurements were employed (less than what one would hope for but all that could be assembled from the available data) to compare the Tarim samples with samples obtained from 21 sites comprising territories extending from the steppelands across Central Asia and as far south as the Indus Valley. In some respects his preliminary (and unpublished) results support those of Han. For example, both Alwighul and especially the later burials from Krorain manifest closest affinities with Bronze Age Bactrian populations, especially the earliest sample from Sapalli Tepe (c. 2200-2000 BC). But what about Qwirghul, our earliest cemetery of Caucasoid in the Tarim Basin?

In Han’s study, the closest affinities with Qwirghul were shared by Bronze Age steppe populations. Hemphill included much the same series of steppe cultures in his own study, including several Afanasievo and Andronovo populations. But not one of the five different statistical tests yielded the expected placement of Qwirghul in the cluster of steppe populations. Rather, the results obtained from his series of multivariate statistical analyses resoundingly rejected any connection between Qwirghul and steppe populations to the west. These analyses repeatedly identified Qwirghul as an outlier that exhibits no close affinities to any other samples. To be sure, a distant and peripheral association was indicated between Qwirghul and populations in the Swat Valley of Pakistan, but it is more likely that the Qwirghul people are simply so different, so peripheral, from their contemporary neighbours that at the present we cannot determine the ultimate origins of this population with any degree of certainty. Nevertheless, one possibility raised by these results is that the ancestors of the Qwirghul people may have entered the Tarim Basin in small numbers some centuries or more before the skeletal remains we have discovered. Once settled, the Qwirghul population may have experienced a significant degree of genetic drift that served to set them apart from their parent and any contemporary neighbouring population. Nevertheless, it is quite clear from the results obtained by Hemphill that any explanation which seeks to account for the origins of the Qwirghul people by suggesting that they stemmed from a massive migration of Caucasoid steppe populations is not supported by the biological evidence currently available. Hence, until we have more measurements and more evidence of neighbouring populations, the origins of the Qwirghul people, at least from the perspective of biological anthropology, remain a mystery.

Universal Donors

At present, the most precise source of information on the origin of the European populations in East Central Asia rests with the skeletal remains but future analysis may lie elsewhere. The mummies, like any cadaver stretched out on the coroner’s table, can be made to reveal something of their identity. Chinese scientists have examined several of the best-preserved mummies and have provided us, for example, with information concerning their blood types. This, incidentally, was not gained directly from the blood itself but from samples of hair and rib. Although our data is extremely restricted, so far it suggests that prehistoric Xinjiang was a good area for a transfusion: all the mummies so far examined have been revealed as universal donors, i.e. type O. Blood typing has been carried out on the ‘Beauty of Krorain’ from the cemetery on the Tüwa River and three of the female mummies from Qülchüqua also possessed blood type O. The sample here, however, has been extremely small and is incapable of providing us with much in the way of useful information concerning the origins of the mummy population.

In addition to blood type, the ‘Beauty of Krorain’ was examined by the Immunological Laboratory at the Shanghai Institute of Blood Transfusion. Here the scientists were interested in retrieving evidence for what is known as human lymphocyte antigens or HLA; these are proteins that form on the white blood cells and are part of the body’s immune system. As there is great diversity in the immune response of individuals, examination of HLA subtypes has become of considerable interest to those tracing the migrations of people, or at least their genes, since the variation within HLA samples provides markers of one’s genetic ancestry. The ‘Beauty of Krorain’, for example, possessed the following antigens: HLA-A2, A9, A11, B5, B40 and Bw22. There is nothing startling about such a combination of antigens since they all occur among native populations of China. What might be observed, however, is that two of them (HLA-A9 and HLA-B40) both show distinct associations with northern Eurasia and their frequency diminishes the farther one moves south. The HLA evidence can accommodate the hypothesis that there was movement of some populations from the north into the Tarim Basin although it hardly secures such a conclusion.

Genetic Fingerprints

Another approach to the ancestry of the Tarim mummies is genetics. It should be emphasized that public expectation that the study of DNA will resolve all major issues of the origins and migrations of peoples far
outstrip what we can say with any degree of confidence at the present time. Statements that the closest living relative to some genetically fingerprinted mummies is an estate agent in South London might make good press but are of little historical value when we know so little about the DNA of all the peoples across Eurasia. Both the available sample size of modern populations and our knowledge of past populations must be extended enormously before we can make the type of pronouncements that many mistakenly assume are already within our grasp. Yet there is still a consensus that DNA will eventually be one of the most powerful tools in the arsenal of the prehistorian.

Those 'molecular archaeologists' interested in tracing the origins and relationships of past communities have concentrated on the genetic trails exhibited by mitochondrial DNA (mtDNA). Unlike cellular DNA, the chains of genes that are a product of both our parents and that reside in the nucleus of a cell, mtDNA is to be found in the mitochondria, the chemical powerpacks of cells, whose genetic contribution derives entirely from the mother's side. The genetic information encoded in mtDNA is then passed from one generation of mothers to the next and in the current most widely accepted hypothesis, this trail leads ultimately to the female ancestor of Homo sapiens sapiens who has been nicknamed 'African Eve'. This trail extends back to something on the order of 130,000 years ago. Following the trail of the mtDNA is far easier than chasing after one's DNA inheritance because mtDNA possesses 37 genes arranged in 16,569 base pairs while that of cellular DNA itself possesses hundreds of thousands of genes in 3 billion base pairs: if one is looking for a needle in a haystack it is best to keep the haystack as small as possible.

In terms of 'racial' divisions, the course of mtDNA suggests that modern humans evolved earliest in Africa whence they emerged and began expanding sometime around 100,000 years ago, eventually replacing earlier forms of hominids such as the Neanderthals of Europe. Within Eurasia itself a split later developed between the Caucasians and the Asians who, in turn, divided between the Northeast Asians and the American Indians.

In the more refined study of the population relationships among northern Eurasians, geneticists have usually concentrated on two segments of the mtDNA chain of chemicals known as the control zones, each consisting of about 400 base pairs. Mutations that accumulate in these regions, especially that designated region I, provide historical data on the ancestry of the individual, and scientists are now trying to establish which mutations in these particular regions may reflect a specific historical path.

It was his drive to know the results of DNA analysis on the mummies that first prompted Victor's involvement in the prehistory of Xinjiang. As part of the initial project, Paolo Francalacci from the University of Sassari obtained tissue samples from 11 mummies from Qizilchoqa and from mummies housed in the museums at Ürümqi and Korla, as well as at the Institute of Archaeology in Ürümqi. Although he sampled 11 mummies, the Chinese authorities permitted Paolo to carry off samples from only two of them and the DNA in one of these was too damaged for analysis. At present the genetic history of the mummies rests with but a single individual.

Paolo discovered that the DNA of one of the mummies belonged to what is known as Haplogroup H, one of the nine subtypes of mitochondrial lineages that are largely associated with European populations. Haplogroup H is the commonest marker of European populations and occurs in about 40 per cent of Europeans (but also in about 15 per cent of people from the Near East), while haplogroups A through G are more typically 'Asian'. As it may be found among people of such diverse ancestry as Swedes, Finns, Turks, Cossacks and Sardinians, it cannot so far relate the mummies yet to any specific European subgroup, it merely emphasizes once again that the Xinjiang mummies find their closest genetic relations among Europeans. As for Victor's original quest: the relationship between the Tarim mummies and the Tyrolean 'Iceman', the latest results on the latter show him to belong to Haplogroup K, a widespread European haplotype which occurs in about 10 per cent of the population of Europe. Paolo is convinced that if he were able to recover more tissue samples from other Tarim Basin mummies, they would probably reveal other European and Asian haplogroups.

For the present, 'molecular archaeology' is more a hope than a solution to our problem. If the procedures can be extended to the analysis of ancient populations such as those presented in our survey of human skeletal remains,
Knights with Long Swords

As we have already seen, the Caucasoid physical type continued to flourish in East Central Asia through to the early historical period. This is clearly attested both in the written descriptions of various populations such as the Wusun but also in the splendid frescoes associated with Buddhist shrines in the northern Tarim region near Kucha, specifically at the cave shrines at Qumtura and Qiuxi. The shrines depict stylized deities, guardian figures and, most important from the perspective of physical type, those in the style known as the 'knights with long swords' or 'Tocharian donors' which date to about the 6th and 7th centuries AD (pl. XII). Dressed in the Sassanian style of Iran with long coats, long swords and daggers, the features of the individuals painted are clearly European. Their hair is usually light brown or red which could alternatively be interpreted in terms of their natural hair colour (blonde or red) or of deliberate dyeing as the use of henna to redder hair is known up until the present time in Xinjiang. Either way they make a reasonable match with our earlier mummies, e.g. the 'Ravishing Redhead' of Qizilchogha. The eye colour of the individuals is difficult to determine - they have often been deliberately defaced although in those instances where some colour remains it would appear to be light (grey, green or blue). In these portrayals, one has the impression that we are dealing with local artists depicting their own people. Another perspective perhaps can be seen farther east at Khocho in the Turpan region, the later Uygur capital, where we find paintings of both oriental monks and Caucasoid ones. The combination of green eyes and red hair with the poorly shaved face seen, for example, in the portrayal of a 'local' monk beside a Chinese monk, establishes a very marked contrast (pl. XIII). Another monk from Khocho boasts massive brow-ridges and round eyes, again characteristic of a 'foreigner', at least through the eyes of a Chinese artist. The *Yuxiang zazu*, a document dating to the Tang dynasty (AD 618-906) attributes the exotic appearance of people with blond hair, green eyes and red beards to their being the issue of an ancestral spirit and a cow.

Another site to offer major evidence of the appearance of Caucasoids is Temple 9 from the Buddhist monastery at Bezeklik. Here we again have dons but also monks, the European monks dressed differently from their Mongolid counterparts; the Caucasoid monks also always have their heads shaved unlike the Mongolid monks. The monks are depicted with reddish-brown and black hair and light-coloured (blue, green) or less frequently brown eyes. The rugged European physical type has commonly been assumed to reflect Tocharian speakers. In addition to the monks, we also have two Caucasoid-looking merchants. One had reddish-brown hair and green eyes; the other black hair and brown eyes. The dress here, complete with hats, has been identified as that of Sogdian merchants.

The Modern Population

Ethnically, modern China defines itself as a country of 56 nationalities (the number is growing as additional groups apply for this coveted status which brings with it special consideration) among whom the overwhelming majority (over 93 per cent) belong to the Han. Many of the minorities also belong to Mongolid groups but some retain features characteristic of Caucasian groups, specifically those occupying the northwest of China, i.e. the Kazakh, Mongolian, Uigur and the Uygur of East Central Asia. Other than obvious physical differences between populations - which may be obvious but difficult to quantify - there are also biological differences between the world's major population groups. One of these occurs in what is known as the immunoglobulin Gm which appears in different specific variants or allotypes. For example, Gm 1 is associated with Caucasoids, Gm 2 occurs specifically in Mongoloids and other types of Gm are found among peoples of African descent. Additional differences can be found in the Rh factor where about
15 per cent of Caucasoids possess the relevant gene for Rh negative while the frequency among most Chinese nationalities ranges from only about 0.1 per cent to 0.4 per cent. There are further genetic differences as well.

Chinese scientists have measured these various gene frequencies across the modern populations of their country and these measurements provide the basis for estimating the contribution of various Caucasian-related genes to the four minority groups in which we find them. Among the Uyghurs, 'Caucasian genes' have been estimated at as much as 54 per cent while the Kazakhs, who also occupy parts of Xinjiang, reveal about 34 per cent. To the east in Gansu we find the Dongxiangs with 25 per cent and still farther east in Ningxia are the Hui whose Caucasian admixture is set at about 11-14 per cent. From these figures, the trajectory of Caucasian genetic influence in East Central Asia and East Asia seems quite clear: it originates in the west and diminishes toward the east.

How and when this admixture took place is not entirely clear as we can never be entirely certain whether or not the Uyghurs, before settling in East Central Asia, were already intermarrying with Caucasian populations or, indeed, whether their ancestors had done so when they were living farther to the northeast. What we suspect is that upon their arrival in East Central Asia and the establishment of their own empire there, they engaged in substantial intermarriage with Caucasian populations whose own ancestors may be traced back in the region to the beginnings of the Bronze Age. The blood of the Xinjiang mummies runs through the veins of the current population of the region.
CHAPTER EIGHT

The Usual Suspects:
The Indo-Iranians

At the head of the list of usual suspects are the ubiquitous Indo-Iranians. In one guise or another Indo-Iranian languages were spoken across the entire area of East Central Asia and apart from Chinese in the east and Tibetan to the southeast, and Turkic and Mongol to the northeast, almost all other approaches to the Tarim Basin carried one through lands which were at one time or another historically attributed to the Indo-Iranians. Moreover, if one imagines that archaeology may serve as circumstantial evidence for the distribution of a prehistoric language (this is admittedly a very big 'if'), then the Andronovo culture, which is widely credited with having stimulated cultural change in East Central Asia, is generally associated with the early Indo-Iranians.

We have already reviewed the general linguistic landscape of the approaches to East Central Asia and briefly surveyed the discovery of the various Indo-Iranian languages of the region. It is now time to examine how they fit together, where they originated and whether they can be identified among the prehistoric populations of the Tarim and Turpan basins.

The Indic Overlay

If we attempted to peel off the layers of Indo-Iranian languages in East Central Asia, we would look to the Indic or Indo-Aryan languages as one of the topmost layers. We have seen that the Indo-Aryan languages attested in East Central Asia come basically in two varieties. One of these is subdivided into Sanskrit and Buddhist Hybrid Sanskrit which were the literary languages employed by Buddhists in East Central Asia. Consequently, they are reasonably well distributed over the Tarim Basin wherever we find remains of Buddhist monasteries, and they are also languages upon which translations were made into other languages such as Chinese or Turfanian. Sanskrit as found in East Central Asia occurred only as a written language and almost exclusively in Buddhist contexts. Buddhist Hybrid Sanskrit is essentially a Pālikīrt (vernacular) that was ‘Sanskritized’ in order to serve the needs of Buddhist literature, hence its antiquity can be no greater than Buddhism itself. For this reason, while it is widely attested, the date of its arrival in the Tarim Basin can be no earlier than the spread of Buddhism, possibly as early as the first centuries BC, and the language itself is attested in documents no earlier than the 4th century AD. As it was a liturgical language that was not specific to any ethnic group, it cannot be regarded as a serious contender for one of the vernacular languages of the Tarim Basin. Moreover, the Buddhist context and artificial character disqualifies it as a language that might have been spoken by the prehistoric populations of the Tarim who have left mumified remains.

The second type of Indo-Aryan language embraces Indic vernaculars, specifically what are known as Pālikiitr. While Buddhist monks may have employed Sanskrit and Buddhist Hybrid Sanskrit in their literature and liturgy, we have seen that the administrative language of much of East Central Asia in the first centuries of our era would appear to have been a Pālikīrt. A comparison here might be made between the situation in East Central Asia and that of the Catholic Church which, until relatively recently, employed Church Latin as the language of liturgy while its central administration in Rome used Italian on a day-to-day basis.

We have recounted how Aurel Stein discovered large quantities of Pālikiitr documents in his excavation at the site of Niyā and these date to about the 3rd century AD. The earliest evidence for a form of Pālikīrt in the Tarim derives from a translation of the Dharmapala which was found in Khotan. This document dates back to about the 1st century AD. Now as the earliest evidence for the Pālikiitr in India itself only dates to about the 3rd century BC and Pālikiitr in the Tarim Basin are again exclusively associated with the Kushans (2nd century BC and later), they too make poor candidates for the languages of the prehistoric populations. Moreover, some Pālikīrt documents recovered from the site of Niyā contain Iranian words which suggests either that a Pālikīrt was superimposed on a population that spoke an Iranian language or, more likely, that it arrived in the Tarim after absorbing Iranian loanwords along the way, i.e. as it passed through Bactria, one of the cultural and religious gateways to East Central Asia. Either way, we have good reason to regard Indo-Aryan as a weak contender for the language of any of the prehistoric mummies although a native Indic speaker might possibly be identified with some of the mummies from the region of Krorān that date to the Han or a later period. But we'll find some better candidates among the much more diverse set of Iranian languages.

Sogdian

Although Sogdian was widely employed in the Tarim Basin, it is not one of our prime suspects. Even more than the Indo-Aryan languages, Sogdian,
could be cast in the role of a late interloper in East Central Asia, albeit an extremely important one. Surely the most eclectic of the Iranian languages, Sogdian served as a vehicle for recording the documents of not only the Buddhists but also of the Manicheans and Christians in the Tarim and Turfan basins. In addition, it was employed to record secular documents, which is not at all surprising since Sogdian served as the *lingua franca* of the northern half of the Silk Road. Most documents written in Sogdian date to the 7th to 9th centuries although they occur from at least the 4th century AD and there are inscriptions on coins in Sogdiana that date to a few centuries earlier. Although Sogdian itself has become extinct, it is survived by Yaghnobī, a language spoken by a community of less than 2,000 people in Tajikistan.

For the purposes of our survey, the expansion of Sogdian into East Central Asia must be regarded as a relatively recent phenomenon. The centre of Sogdian speech was Sogdiana with its centre in the Samarkand-Bukhara region and its core area was confined to Uzbekistan. It is from there that the language was carried eastwards into the Tarim Basin by Sogdian traders who controlled the caravans' transit around the northern and southern rims of the Tāklamakan Desert. There is no reason then to see in Sogdian anything other than a language that entered the Tarim region with the opening of the Silk Road; there are no grounds to associate it with the earlier prehistoric populations of Xinjiang.

**Saka**

The best-attested Iranian language of East Central Asia is Saka or Khotanese Saka which serves as a reminder that the manuscripts of this language were found primarily in the territory of ancient Khotan on the southern branch of the Silk Road. The language is attested both in literary documents, essentially translations of Buddhist literature, and in secular documents. The script used to convey the language was the Brahmī script that was imported from India and employed in the production of the Buddhist originals that were translated into Saka.

Other documents in a Saka language have been recovered from the northern branch of the Silk Road at Maralbash and Tumshuq. In addition, pre-Islamic Qāshqā is also assigned to Saka speakers. The datable Saka documents begin in about the 7th century AD and continue through to the 10th century, by which time Uyghur was replacing all the earlier languages of the Tarim Basin. Saka documents were apparently carried eastwards from their native territory into the region around Turfan and farther into Gansu, since Khotanese manuscripts were found at Dunhuang.

From a geographical perspective, the Saka dialects were originally confined to the western part of the Tarim Basin and, at least in documentary form, only moved eastwards after they had been long established in the western Tarim.

The Saka, as we have already seen, constituted an ethnic group that occupied an enormous area which, according to ancient historians, spanned the European and much of the Asian steppe – if one wishes to include both the Scythians and the people whom the ancient Iranians called Saka in a single linguistic entity. We have also seen that they expanded to rule briefly in both Bactria and northern India. It is ironic then that most of our linguistic evidence derives from their easternmost outpost in East Central Asia; where they dominated in Bactria or northern India, the evidence is largely confined to personal names of rulers. It is as if the French language were known primarily from the documents written in Corsica rather than in France itself.

The trajectory of the Saka languages in Xinjiang would appear to have been from west (or northwest) to east and, although they became extinct in East Central Asia, dialects related to the earlier languages of the Saka have survived in the western Pamirs. Some of these languages such as Sātikōli can be found near Tashkurgan in Xinjiang itself, although linguists regard this as the result of the relatively recent movement of Shugni immigrants, speakers of another Saka-related language situated in the Pamirs. Wakhšī is spoken in the ancient territory of Wakhān in the southern Pamirs. In general, these languages, related most closely to that of the ancient Saka, are located in those valleys through which one must pass if one wishes to link up with the western ends of either the northern or southern routes along the Silk Road through the Tarim Basin.

For us the critical question is how long the Saka language was spoken in the Tarim Basin. Here, unlike the other languages, we are not dealing with an essentially religious or trade language but rather one that also provided a vernacular for established populations. Moreover, we are dealing with an historical entity, the Saka, who were attested by name in historical documents by the end of the 6th century BC, at a time preceding the development of Buddhism and the Silk Road. To all this we might add the evidence of physical anthropology which relates many groups of ancient Tarim populations, ranging from the Ili River in the north southwards to Tashkurgan and Sampul near Khotan, with population types known from the Pamirs or Fergana, two territories historically occupied by Saka tribes. To explore how early Saka-speaking populations may have entered Xinjiang, we need to widen our linguistic picture and work our way back to the emergence and dispersals of the Iranian languages.

**Eastern Iranians**

Linguists are fond of drawing family trees of languages which provide a simplified genealogy of a language's development and relationships. The Saka language and its descendants belong to the northeastern group of Eastern Iranian languages. These are the languages that spanned both the region of the Eurasian steppe in antiquity (i.e. the languages spoken by the Scythians and the Saka) and the languages of Central Asia that were
evidently affected by movements from the steppelands southwards (e.g. Choresmian, Sogdian and Bactrian). In some instances, the steppeland languages penetrated mountain retreats, e.g. Ossetic in the Caucasus and the Iranian languages of the Pamirs. All of these are more closely related to one another than they are to the West Iranian languages that moved to take up positions south of the Caspian, e.g. Median, Parthian, Old Persian and their descendants.

The earliest attested of the Iranian languages is Avestan (assuming its composition date is earlier than the Old Persian inscriptions), the liturgical language of the Zoroastrian religion. We have already seen that setting an absolute date for the Avestan language is problematic but a date of about 1000 BC would probably not be too far wrong. We have also seen that historical attestations of other East Iranian languages are, at least, ethnological groups date from about 600 BC. There is, therefore, nothing that would violate the linguistic plausibility of a movement of Saka speakers into the Tarim Basin sometime within the 1st millennium BC, i.e. at a time by which we already have considerable evidence for Caspian mummies. How much earlier carries us into the chronological relationships between Iranian and Indo-Aryan.

**Indo-Iranians**

Within the Indo-European language family, the most closely related language stocks are those of the Iranians and Indo-Aryans, which, as we have seen earlier, are so closely related that we can reconstruct a common Proto-Indo-Iranian language. The date of separation between the Iranian and Indo-Aryan languages obviously marks the lower threshold for the date of any Iranian language. In other words, the intrusion of East Iranian Saka speakers into East Central Asia can hardly be earlier than the separation of the Iranian branch from Indo-Iranian. To what extent can we fix a date for this process?

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The earliest evidence that such a split between the Indo-Iranian languages occurred dates to about 1500 BC and is to be found in those archives of the Hititite empire that relate to the region between the Zagros Mountains and northern Mesopotamia. Here we discover the existence of a state historically known as Mitanni. The Mitannians spoke the local non-Indo-European language, Hurrian, which is known in this region from the 3rd millennium BC onwards. But although their language was Hurrian, they also left traces of an Indo-Aryan language. When they concluded a treaty with the Hititites, for example, they swore not only by the Hurrian and any other local deities but also by the gods Indara, Mitrasal, Narsila and Uruvanasal, who correspond nearly to the gods of the Rigveda, named in the ancient hymns of the Indo-Aryans as Indra, Mitra, Nāṣṭya and Varuna. We also find Indo-Aryan words used to describe the number of turns a chariot does about the course and the colors of the horses of a chariot team. This association between Indo-Aryan and chariotry is very close and, as we will soon see, absolutely critical. Among the texts in the Hititite language is a manual for training horses written by Kikuli 'the Mitannian' which also includes such Indo-Aryan loanwords.

In order to explain this Indo-Aryan element among the Mitannians, it is generally presumed that Indo-Aryan charioteers may have superimposed themselves briefly as rulers of Mitanni and, although they were absorbed into the local population and adopted the local Hurrian language, they left traces of their origins in the names of their gods, in some of their personal names and in the vocabulary of their chariots. The archaeological evidence can accommodate the linguistic evidence since it is in about 1500 BC that we find evidence for both the horse and chariot in the area southeast of the Caspian. Moreover, artistic motifs from this area depict figures that appear to be among the earliest 'animal style' art motifs known across Eurasia, and we have already seen that this style is typical of the populations of the Indo-Iranian steppelands. Ritual paraphernalia, similar to those employed later in India, are also encountered. Furthermore, it is to about 1500 BC that one tends to date the arrival of the Indo-Aryans in northwest India (although demonstrating this archaeologically is another thing altogether). In any event, by c. 1500 BC, the Indo-Aryan language would already seem to have evolved from Proto-Indo-Iranian and taken on an independent identity.

In about 1500 BC we have historical evidence suggesting that a split between Indo-Aryan and the rest of the Indo-Iranian languages had occurred; we do not know how much earlier it might have occurred. Unfortunately, beyond historical records, the dating of a linguistic event becomes increasingly conjectural with time. We do, however, have several kinds of circumstantial evidence. First, as we have already seen, the languages employed in both the Avesta and the Rigveda, the two central religious texts of the Iranians and Indo-Aryans respectively, are so close that linguists do not believe they could have long been separated, certainly by no more than 500 years. The dating of neither text is secure, but on the widely
held presumption that the *Ṛgveda* dates to about 1200 BC, possibly somewhat earlier, we would still be talking about a date of separation this side of 2000 BC. Secondly, if we consider the question of chariotry, the vocabulary of which is found in the Indo-Iranian languages and, more specifically, in documents from Mitanni, some of the earliest evidence for the spoke-wheeled chariot dates to about 2000 BC where chariots are found at the site of Sintashla in the southern Urals. If we must look for the earliest Indo-Iranians, they should be sought somewhere before 1500 BC and, admitting that the antiquity of any item of material culture may be pushed back somewhat earlier than our existing knowledge allows, after 2500 BC. What all this permits (suggests would be far too strong a word) is that Eastern Iranian, the language grouping which appears right across the steppelands and in East Central Asia, might have existed as early as the 2nd millennium BC, and although it might be pushing it a bit, we cannot really exclude the possibility that Eastern Iranians could have existed at the same time that Caucasian populations began entering the Tarim Basin. Where might they have come from?

The Indo-Iranian Enigma

The search for the origin and dispersal of the Indo-Iranians takes us into one of the great puzzles of Indo-European studies since the evidence could not be more contradictory (the spice of intellectual enigmas). Let us lay out the ground rules and see where they get us.

We begin with two observations. First, the Indo-Iranians are a major branch of the Indo-European language family and so they must be genetically related to their Indo-European sister branches, in particular, their closest relations the Slavs, Balts and, perhaps more distantly, the Armenians and Greeks. We cannot start the Indo-Iranians off somewhere in Eurasia on their own as if they had an independent story to tell; they are merely part of the larger story of Indo-European expansions. Any ‘solution’ to the puzzle of Indo-Iranian origins that neglects this point is an illusion.

Secondly, when we first meet the Indo-Iranians, they are in motion and moving over territories where we have excellent or at least good circumstantial evidence that the previous occupant were non-Indo-Europeans. We have already seen that the earliest Indo-Aryans managed to superimpose themselves or at least heavily influence a non-Indo-European people, the Mitannians, in the Hurrian territory west of the southern Caspian. Persians pushed south through Iran to superimpose themselves on the territories of Elam which preserved its own native language long enough to require the Persian kings of the 6th-5th centuries BC to employ Elamite, along with Old Persian and Akkadian, in their inscriptions. The Persians, of course, occupied territories previously held by the Assyrians and are only mentioned in Assyrian records from the 9th century BC onwards. The linguistic situation in northern India is difficult to reconstruct on primary evidence. The Harappan culture or Indus Valley civilization (c. 2700–1900 BC) had its own script but we know too little about it to translate it with any great confidence, although the work of Finnish linguists such as Asko Parpola, who have proposed decipherments employing a Dravidian key, would certainly seem to offer the best bet. The Dravidians still occupy the southern third of India and with pockets of Dravidian speakers farther north and Dravidian loanwords in the earliest Indo-Aryan texts, this all suggests that they were once spread over much more of India and have been subsequently pushed southwards by the Indo-Aryans. In fact, some argue that Dravidian is closely related to Elamite, the native language of southern Iran, and that this linguistic continuum (Elamo-Dravidian) was shattered by Iranians in the west and Indo-Aryans in the east.

The conclusion that one draws from all this is that the Iranian language did not begin in Iran and the Indo-Aryan language did not derive from the Indian subcontinent. They both had to come from elsewhere. A quick glance at the map of Eurasia with its various linguistic entities in mind tells us where to look. The Indo-Iranians could not have come from China or Tibet since this was the homeland of a very different language family. To the south and to the west we have the Elamite, Sumerian, Semitic and Hurrrian civilizations – all non-Indo-European families. The Indo-Iranians must have been intruders from the north.

Intruders from the North

In the 1920s Harold Peake and Herbert Fleure published a marvellous series of small books entitled *Corridors of Time*. One of the volumes was *The Steppe and the Sean*; it contrasted the development of pastoral nomadic
societies on the Eurasian steppe with their agricultural neighbours, and while the book is now naturally out-of-date, its title and central focus still encapsulate the major issue of Indo-Iranian origins. We have already recounted at some length the peoples of the steppelands, the Scythians, Sarmatians, Alans and, most importantly, Saka, and seen that they all belong to the northeastern branch of the Iranian group of languages. Our earliest historical testimony of their existence dates back to the mid-1st millennium BC, the Iron Age of the Eurasian steppe when we learn from historical sources such as Herodotus that the steppelands were occupied by various groups of pastoral nomads. At this time our archaeological evidence is overwhelmingly derived from burials such as the Scythian tombs of the Ukraine or the royal burials at Pazyryk in the Altai Mountains.

We can follow the archaeological trail of Eurasian nomads back into the Bronze Age. The Andronovo culture, in actual fact a blanket term for a number of regional cultures, occupied the entire West Asiatic steppe from the Ural River east to the Yenisei in the period c. 2000–900 BC. There is evidence of both settlement and burial. The Andronovans occupied small villages, generally with a few up to about twenty houses, situated in a row along a river. The houses were relatively large in dimension (80–300 sq. m (860–3,230 sq. ft)), semi-subterranean, i.e. dug partially into the ground (one of the old Iranian words for ‘house’ or ‘room’ is karta which is usually taken to mean originally ‘dug out’), and roofed with timber beams. The economy was based primarily on stockbreeding with abundant evidence of cattle, sheep/goat and horse, and occasionally even camel; the pig, a sure indicator of a permanent settled form of life, is conspicuous by its absence. Everything points to a relatively mobile economy or, at least, one which included a mobile component. The deceased were buried in timber or stone-lined chambers which were covered by barrows, or, to use the Russian word, kurgans, a feature of steppeland burials that is encountered on the European steppe at least since the 4th millennium BC. They were accompanied by animal offerings, including horses, cheek-pieces indicating horsemanship, wheeled vehicles, ceramics, and metallic weapons and ornaments. One of the predecessors of the Andronovo culture is the Sintashta culture (c. 2300–1900 BC) of the southeast Urals which is represented by both fortified settlements and royal burials that included some of the earliest evidence for chariots in Eurasia. There are few, if any, archaeologists who would doubt that Sintashta and Andronovo represent the prehistoric Iranians or Indo-Iranians of the Eurasian steppe. Conclusion: the Indo-Iranians were clearly the preponderant pastoralists of the West Asiatic steppe.
South of the Aral Sea in the territory of ancient Bactria and Margiana we find at the same time a series of agricultural settlements attested by complexes of fortified citadels, both rectangular and circular. The economy was based on mixed agriculture, the use of irrigation providing the basis of a cereal economy. The primary domestic animal appears to have been sheep/goat followed by cattle; there is so far no certain evidence for horse. The settlements, which date to c. 2200–1700 BC, also contain elaborate ritual complexes. In these multi-roomed structures there is clear evidence of both fire altars and rooms for the preparation and consumption of hallucinogenic beverages. The fire altars with their accompanying ash pits closely match the descriptions of the fire cult found in the later religious literature of the Zoroastrians of Iran and the Vedic Indians (and Chinese historical documents for some of the populations of East Central Asia). The temples also exhibit rooms which contain all the necessary apparatus for the preparation of drinks extracted from poppy, hemp and ephedra. One of the central cults of the ancient Indo-Aryans and Iranians involved the consumption of the hallucinogenic compound (a liquid form of ephedra) known as soma in India and haoma in Iran (or *sauza in the ancestral Proto-Indo-Iranian language) and we find its use attested earliest in the ritual centres of what is now known as the Bactria-Margiana Archaeological Complex (BMAC). The art of this culture has also been interpreted in the light of the religious motifs depicted in the sacred writings of the Indo-Aryans and Iranians. Burials containing BMAC material are subsequently found farther to the south on the main approaches to northern India as one might predict for the immediate ancestors of the Indo-Aryans. It is clear then that the prehistoric Indo-Iranians were the occupants of these agricultural citadels. Conclusion: the Indo-Iranians originated in the agricultural oases of Central Asia.

How do we reconcile deriving the Indo-Iranians from both the 'steppe' and the 'sown'? This is not easy since the origins of the two cultural worlds are very different. The BMAC and its antecedent cultures can be traced back to the earliest farming communities of the southeast Caspian. Here, colonists pushed northwards from highland Iran and Iraq to establish farming villages by the 6th millennium BC. The development of irrigation permitted farmers to expand eastwards into the oases of Bactria and Margiana. Most of the cultural influences that we find in the Central Asian agricultural settlements derive from neighbouring cultures of the south and west. In a very crude way, the Early Bronze Age oasis citadels of Central Asia reflect a push northeastwards of cultures whose roots lie in the Near East.

On the other hand, the steppe cultures of the Sintashka and Andronovo cultures look westwards for their antecedents. Increasingly mobile economies based on stockbreeding had emerged by the 5th and 4th millennia on the European steppes between the Don and the Volga rivers. It is here that we find the evolution of wheeled vehicles (in the steppe region at least) from the 4th millennium BC onwards. Direct cultural antecedents of Sintashka-Andronovo can be found in the Early Bronze Age cultures between the Volga and the Ural. And as the Andronovo culture emerged in Kazakhstan, so also did its sister culture, the Timber-grave or Srubna culture, appear on the European steppe where it provides archaeological antecedents for peoples like the Scythians of the western steppes.

It is evident then that there is no way we can construct a common origin for the steppe tribes (whose origins lie between the Don and the Volga) and those who occupied the oases of Central Asia (whose origins lie south and west of the Caspian). By extension, there is no way we can find in the two cultural regions grounds to identify a common linguistic ancestor. The odds of two totally different and independent cultural worlds simultaneously developing the same Indo-Iranian language are about the same as the hordes of simian typists successfully completing *Hamlet*. We are going to get nowhere in reconciling the two different cultural traditions by looking to their roots; we must look elsewhere.

Contact

While the Andronovo culture and that of the oasis-dwellers of Central Asia were not genetically related, they were most certainly aware of each other’s existence and came into frequent and quite close contact. This is indicated by the three types of evidence.

The characteristic Andronovo pottery provides a trail of its contacts as this hand-made ware is fundamentally different from the wheel-thrown ceramics manufactured in the semi-urban oasis complexes. Yet it can be found in varying amounts in BMAC settlements which indicates some form of interaction, presumably direct, between the peoples of the steppe and those of the sown. The presence of Andronovo material on BMAC sites suggests that Andronovo tribes may have traded with the semi-urban settlements, and the presence of such pottery in the very cult centres indicates that they may also have participated in the religious rituals of these centres.
The second hint of an Andronovo presence in Central Asia is even more concrete. In the area immediately south of the Aral Sea we find the Tazabagyab culture (c. 1500 BC) which itself is regarded as a variant of the Andronovo cultural horizon. But unlike their northern kinsfolk, here they settled to engage in small-scale irrigation agriculture. There are some 50 or so small Tazabagyab villages known with their distinctive semi-subterranean houses measuring about 10 by 10 m (33 by 33 ft) or more in size. Their metal artifacts and ceramics show their derivation from the steppelands, and here we also find remains of horses as well as the other domestic livestock. In their burials, males are interred on their right sides while females are placed on their left, a practice seen in other areas of Eurasia. This purportedly reflects a gender Symbolic view of the world where males were associated with the right, and here we not only mean the direction and right hand, but as in English usage, 'being right', straight, open, healthy, strong. Females, in this (obviously male-biased) system are associated with the left, the unpropitious direction in Indo-European thought, and one that is associated with a host of negatively charged ideas - unhealthy, crooked, devious - or, as with the word for 'left' in Latin, sinister.

The third hint of steppe pastoralists in the region is a series of independent cultures contemporary with the BMAC but which could in no way be regarded as proto-urban. In southern Tajikistan, for example, we find the Bishkent culture (c. 1700–1500 BC), which is known primarily from the cemeteries of mobile pastoralists. The ceramics are apparently a mixture of local, BMAC and Andronovo styles while the metalwork is clearly Andronovo-derived. At the cemetery of Tulikhar there were found about 80 burials with the same sexual marking of position as we saw in the Tazabagyab culture. Moreover, here there were other hints of Indo-Iranian practices. The burials of the different sexes were accompanied not only by the usual grave goods but also by hearths. Males were provided with small rectangular hearths, reminiscent of the rectangular fire hearths (ākavaniya) of the Indo-Aryan male priest while the women were given small round hearths, a shape ascribed in Indo-Aryan belief to the garhāpata, the domestic hearth usually associated with women. In the same region along the middle and lower reaches of the Vaksh River (which, for those who enjoy such trivia, is the location of the highest dam in the world) is a culture of that name which is contemporary with the Bishkent culture. Here there is some slight evidence that the population lived a more settled way.

151. Generalized distribution of the Andronovo culture and the cultures sometimes linked with it: note that the Andronovo culture came into contact with that of the Bactria-Margiana Archaeological Complex (BMAC). Mountain ranges are indicated by the dotted area.

152. Burials from the site of Tulikhar find males associated with rectangular hearths and females with round hearths, a pattern later suggested in Vedic religion.
of life (houses of stone and mud brick), and engaged in mixed agriculture (barley, wheat, cattle, sheep/goat, horse, donkey and camel). Burials include graves with small carnovart niches and the placement of small stones in a swastika arrangement.

All of this suggests that in the period between c. 2000 and 1500 BC, steppe tribes penetrated West Central Asia and were actively engaged in exchange with the more settled oasis communities. It also demonstrates the capacity of these earlier nomadic tribes to absorb material culture and probably behaviour from their more settled neighbours. In some instances, there is clear evidence that they were able to settle and exploit the region as irrigation agriculturalists as well. We are dealing with a highly adaptable society that could adjust to circumstances and opportunities. It hardly needs emphasizing that these are precisely the same types of skills and economies that would prepare communities to move off the steppe and settle in the oases of East Central Asia where we find our earliest mummies. The central question now, however, is linguistic: in the meeting of the steppe and the sown, whose language predominated?

Whose Language?
The answer to the question of whose language eventually won is based on evidence that is circumstantial but nevertheless fairly persuasive. Let us perform an experiment and consider what happens if we assume that the Indo-Iranian languages did originate among the oasis-dwellers of Central Asia, a theory that has some vigorous proponents. In this model, the Indo-Iranian language of the oasis-dwellers (BMAC) would have to have spread to the Andronovans of the Asiatic steppe. Since we have evidence for Iranians in the European steppe as well, the Andronovans would have been required to carry their language into southern Russia and the Ukraine. Although there is no solid archaeological evidence for such a movement at the time required, we can also maintain that there is no archaeological evidence to contradict this. But when we consider that Indo-Iranian is merely one branch of the Indo-European language family, then the entire edifice of this proposition crumbles. Where were all the other Indo-European stocks when the Indo-Iranian languages were evolving? We have already seen that they could not have lain to the east, south or immediate west of Central Asia, since these territories were all occupied by non-Indo-European language families. The only direction left is north but the model we have just proposed has presumed that the north was occupied by something else (Andronovans?) before it became Iranian. What happens to the Slavs, Baits, Greeks, Italic, Celts, Germans and other Indo-European groups? There is just no room in this model to place Indo-Iranian in the context of the other Indo-European languages, particularly those of Europe. As we have seen, no solution to Indo-Iranian origins can be regarded as adequate unless it can also be accommodated within the general framework of Indo-European movements.

An indigenous Central Asian origin for the Indo-Iranians falls at the first hurdle.

The alternative is to presume that the Indo-Iranians are to be associated with the steppeland cultures. This can at least be fitted into most solutions to Indo-European dispersals that see the Indo-Iranians emerging from the earliest development of European steppe cultures during the 3rd millennium BC. The other Indo-Europeans lay to the west, either by virtue of having occupied eastern Europe (beyond the steppe) since the beginning of the Neolithic or because earlier steppeland peoples, beginning in the 5th and 4th millennia BC, had spread westwards into the Danube basin and superimposed their earlier forms of Indo-European in that region.

When it comes to the interface between the steppe and the sown in West Central Asia itself, this second model depends on the social organization of the steppe cultures as a possible explanation for the spread of their language. We have already seen that they were capable of producing fortress-dwelling and chariot-driving aristocracies by c. 2000 BC. They also exploited and controlled a vast system of metallurgical extraction, production and exchange that extended from the west European steppe as far east as the Yenisei. The more mobile populations were, as we have suggested above, the internet and social glue that connected a vast region of Eurasia. According to this model, the Andronovans would have come into contact with the oasis-dwellers, adopted items of their material culture, some of their religious beliefs and cultural practices (such as the fire cult and consumption of the hallucinogenic "soma"), but not the language of the oasis-dwellers. Rather, the language of the steppe-dwellers would have operated as the "lingua franca" of exchange between regions, then perhaps within the settlements themselves until some variety of Indo-Iranian had become the main language of West Central Asia (perhaps in the same way as Uygur came to dominate in East Central Asia).

As we have noted, evidence for the BMAC is not limited to West Central Asia but is also found farther south on the main approaches to northwest India where it would appear to be intrusive wherever we find it. It is possible that during the period of the BMAC, the linguistic stage of Indo-Iranian would find the BMAC and its southern spread associated with the separation of the Indo-Aryans from the Iranians of the north. The linguistic difference between Indo-Aryan and Iranian is slight enough that those changes that distinguish Iranian from Indo-Aryan could then spread through the northern regions after the collapse of the BMAC.

And the Mummies?
Let us review what we think we can say about the Iranian languages of East Central Asia. All the Iranian languages attested across the territory belong to the group of East Iranian languages and at least some of them still survive along the western periphery of the Tarim Basin, particularly in the Pamirs.
All these languages would also seem to have home territories farther to the west in Central Asia or the Asian steppes. Both of these statements have some additional significance. We should emphasize that there is no evidence of an Iranian language that belongs to a different subgroup of Iranian and, more importantly, we have no evidence of some "earlier" form of Iranian or Indo-Iranian language in East Central Asia. So far we have treated the Indo-Iranian languages as a double (Indo-Aryan and Iranian) block of languages to keep things as simple as possible, but now we need to mention that a third "branch" of the group exists—the Nuristani languages of the Hindu Kush. Attested only in recent times and over a small region, the Nuristani languages belong specifically to neither the Indo-Aryan nor the Iranian branch but are generally treated as having divided at such an early period from the Indo-Iranian continuum that they should be treated as a separate mini-branch (although they may be more closely related to Indo-Aryan). Such an early separation tells us that we may be dealing with a linguistic tenant that survived during the original spread of the Indo-Iranian languages c. 2000-1500 BC, i.e. Nuristani represents a residual branch of Indo-Iranian which attests to the presence of Indo-Iranians near the southwestern approach to East Central Asia. But we have no evidence that Nuristani or indeed any similar "early branch" of Indo-Aryan or Iranian was spoken in the Tarim Basin. We are left only with the more recently attested norheastern Iranian languages. This may, obviously enough, be accounted for by two hypotheses. First, a very early form of Indo-Iranian language may have entered the Tarim Basin between c. 2000 and 1500 BC and may have been spoken by the Bronze Age "mummy cultures"; this language (attested in no later written sources) was then subsequently replaced by a specifically norheastern Iranian language. Alternatively, the earliest Iranians in the Tarim may only have arrived after the dispersal of the Iranian languages across the Eurasian steppe and Central Asia. This would accommodate a later arrival of the Iranians in the Tarim.

If we reflect back on the picture gained from the evidence of physical anthropology—be it the admittedly suspect "typological" approach or Brian Hennessy’s more robust multivariate statistical approach—then we have at least two, possibly three, waves of Indo-European population groups penetrating the Tarim Basin. Where the earliest emerges from is still disputed but the later intrusion, cast either in terms of Indo-Afghan and Pamir-Panj Fergana physical types or simply the grouping that finds a close affinity between Altai and Khorasan on the one hand and Bronze Age Bactrians on the other, can support the thesis of later population movements from the west (the direction of Bactria). This is, at least, suggestive that the earliest Iranian populations in East Central Asia entered in the 1st millennium BC carrying a variety of northeastern Iranian dialects eastwards. This would permit us to assign some of the mummies from the 1st millennium BC to the Iranians. Could Iranians be identified with still earlier populations in the Tarim region?

Here we should recall that, in our review of the archaeology of East Central Asia, we have seen how the basic subsistence economy from c. 2000 BC onwards must have derived from the west, wheat, barley, domestic sheep, domestic horse, domestic camel, bronze working and wheeled vehicles would all have come either from the northern steppelands or from the agricultural communities of West Central Asia. We have also already noted how the use of ephedra in the Qiwiqian culture, where it was deposited with burials, might be linked to its use in the BMAC religious shrines where it was consumed in liquid form as "stampa. Moreover, the BMAC drained the trail of oasis-dwelling cultures to the east and would have possessed the knowledge necessary to initiate irrigation agriculture in the Tarim Basin. In short, if we could fly BMAC colonists from Bactria into the Tarim oases they would make a very strong theoretical candidate for the earliest agricultural settlers in the Tarim Basin. But we can only talk of them theoretically in the 2nd millennium BC since we have no clear evidence of transplanted BMAC populations in East Central Asia. We may find BMAC graves over a wide area of West Central Asia but they are not so far directly attested in East Central Asia. It may be that our knowledge of the Bronze Age of Xinhuan is still too woefully inadequate that we have not yet discovered concrete evidence for Bactrian immigrants. There are, to be sure, seals from the Ordos region of China (centred in Inner Mongolia) that have parallels among the Bactrian seals but these do not indicate any more than distant exchange relations that never involved transit through the Tarim Basin itself. It may also have been that the mountain passes of the Pamirs proved too much of a melting pot for Bactrian colonists to preserve their material culture in their journey into the Tarim Basin. Fortunately, in our attempt to establish the ethnic identity of the earliest mummies we still have one more suspect.