Beads at *The Place of White Earth* - Late Neolithic and Early Chalcolithic Aktopraklık, Northwestern Turkey

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The site of Aktopraklık in northwestern Turkey was inhabited during the Late Neolithic and Early Chalcolithic periods, from the mid-7th to mid-6th millennia B.C. The site lies in a region that came to link Anatolia with Europe through the introduction of early farming practices and has already provided much information about the groups which inhabited the area along with their domesticated plants and animals. Although scientific techniques have led to recent breakthroughs in our understanding of the dynamics of change in the region, it is material culture that continues to form the foundation of archaeological research into daily life. Aktopraklık saw a particularly prolific use of beads that indicates complex networks of communication and exchange with other areas, both near and far, as well as possible early craft specialization. This article provides a brief introduction to these beads and their implications for the archaeology of prehistoric northwestern Turkey.

INTRODUCTION

Northwestern Turkey is an important region in prehistory for a number of reasons. Although it was not at the forefront of the major innovations of the Neolithic period – animal domestication and agriculture – it was an area through which various movements of ideas, materials, and people seem to have been channeled on their way to Greece and the Balkans. As such, the area can be considered as both well connected and important in understanding the processes of prehistoric change, particularly from the Late Neolithic period onwards.

Scientific techniques, particularly DNA analyses, have played an increasingly important role in explaining processes of change; material culture, however, has provided the foundation of archaeological research in the region. Pottery has traditionally been the focus of research of the Late Neolithic and Early Chalcolithic periods, and the assemblages of northwestern Anatolia are well understood. Other items of material culture, among them beads, have received less attention. Indeed, personal ornaments of the Turkish Neolithic and Chalcolithic periods have only recently begun to receive the attention of researchers. It has already been shown that ornaments – mostly beads and bracelets – have much to offer archaeologists trying to understand wider questions in prehistory: How did people interact with the landscape? How did human groups interact with one another? How did ideas spread? How did trade and exchange routes work? How was production organized?

The site of Aktopraklık, located in the Marmara region of northwestern Turkey and excavated under the direction of Necmi Karul of Istanbul University since 2004, has extensive deposits of Late Neolithic and Early Chalcolithic date containing considerable quantities of personal ornaments. In this article, the approximately 13,000 beads excavated at Aktopraklık between 2004 and 2014 will be considered in the light of the questions outlined above, with particular emphasis on evidence for connections and specialized production.

AKTOPRAKLİK AND THE LATE NEOLITHIC AND EARLY CHALCOLITHIC OF NORTHWESTERN TURKEY

Northwestern Turkey, particularly the Asian side of the Marmara region (Figure 1), has seen intensive archaeological research into the Neolithic and Chalcolithic periods (Özdoğan et al. 2013). The region has proved to be important in providing evidence about the process of neolithization – how ideas, subsistence technologies, and human populations moved and spread. Recent studies of DNA sequences have shown that people moved from northwestern Turkey and the Aegean region into central and southwestern Europe (Hofmanová et al. 2016). While it was previously thought that ideas may have spread gradually via interactions, new sources of evidence highlight the ties between people, technologies, and material culture, and provides incentive to improve our understanding of the people who seem to have, at least in some respects, provided...
the foundation for farming populations in large areas of the European continent.

Although recent focus has been on the transmission of neolithization towards Europe, interest in the history of the Neolithic people and material culture in northwestern Anatolia has led to much research into their possible links to other areas. It seems that from the middle of the 7th millennium onwards, a mixture of new elements and existing local culture and populations resulted in a gradual decline of the hunter-gatherer lifestyle that had been characteristic in the region. Northwestern Turkey has a well-known and relatively coherent pottery culture originally named after the site of Fikirtepe but now known to cover a much wider geographical area (Karul 2011). The development of the ceramic traditions of the region has been used to suggest patterns of development, including the suggestion by Thissen (1999) that the traditions of central Anatolia played a part. The pottery of the region has also opened doors to understanding food culture and the use of secondary products including milk (see Thissen et al. 2010 for details). There are other characteristic features such as bone spoons that are strongly associated with the region and probably also relate to specific food practices (e.g., Erdalkıran 2015).

The site of Aktopraklı is located close to the modern city of Bursa, currently a major Turkish trading hub. The settlement itself is close to a small lake, Uluabat, with two nearby springs, and in a diverse environmental zone that incorporates fertile plains and forested mountains (Karul and Avcı 2013:45). The site has good connectivity to the Eskişehir area, also known to have been inhabited in the prehistoric period. The settlement of Aktopraklı was inhabited from the mid-7th to mid-6th millennia B.C. and, unlike the classic large mound sites of prehistory, changed location repeatedly within the same area (Karul and Avcı 2011).

The site consists of three distinct mound settlements that have been investigated to varying degrees, emphasis being on mounds B and C, which are of Early Chalcolithic and Late Neolithic date, respectively. C consists of round wattle-and-daub huts with surrounding open areas, probably

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**Figure 1.** Map showing sites mentioned in the text.
used for food preparation and other activities. Burials were found under the floors of the houses (Karul and Avci 2013:46) in a tradition familiar to central Anatolian sites such as Çatalhöyük. During the Early Chalcolithic period, C became a cemetery used by the inhabitants of mound B. Grave goods, including pots, polished stone axes, and beads, were found with these burials (Karul and Avci 2013:47).

Aktopraklık B (Figure 2) consists of two significant settlement layers. The earlier level is formed of adjoining, rectilinear mudbrick buildings; the later one of squarish wattle-and-daub huts (Karul and Avci 2013:48). The Early Chalcolithic portion of this area of the site appears to include standard buildings that are encompassed by a large ditch, suggesting that there was a division between the inside and the outside world, although the households within the site can be considered to be largely independent of one another (see Karul 2013 for details).

According to isotope analyses, it is likely that the inhabitants of Aktopraklık relied on a diet based on animal and plant domesticates that was considerably different from the consumption habits of the earlier populations of the region which made more use of marine, as well as other, hunted-and-gathered resources (Budd et al. 2013).

THE PREHISTORY OF PERSONAL ORNAMENTS IN NORTHWESTERN TURKEY

The Neolithic personal ornaments of Anatolia vary greatly not only by region but also within regions as well as within single assemblages which can be made up of both simple natural forms and complex and well-finished products (see Baysal 2015 for discussion). During the earlier Neolithic, there was relatively little repeated production of very similar items and a greater emphasis on individual pieces, some of which show significant signs of long-term use and even recycling after breakage (Baysal and Miller 2016). Although there is little evidence of highly standardized typologies, there were connections through exchange or direct procurement; marine shells were consistently moved around as evidenced by their appearance at inland sites such as Pınarbaşı, Boncuklu Höyük, and Çatalhöyük in central Anatolia, as well as in a wide range of Levantine sites.

Figure 2. Aerial view of the Aktopraklık B excavation area (all photographs by Yusuf Aslan, Aktopraklık Project Archive).
Personal ornamentation practices in Anatolia underwent a period of significant change during the later 7th millennium B.C. From around 6400 B.C. (the Late Neolithic) onwards, the aesthetic of beads moved towards larger, more visible items with an emphasis on the color white and a significant increase in instances of repeated production. Marine shells continued to be important and continued to be moved from place to place, but the preference for the types of shell changed from small carnivorous species not used as a food source to much larger bivalves such as *Spondylus* and *Glycymeris* that were also a source of nutrition. The exploitation of raw material sources, particularly white marble, intensified and seems to be linked to the use of other white materials, including shells.

Before considering the beads of Aktopraklık in detail, it is worth introducing the ornaments of northwestern Turkey and outlining how they relate to wider trends. The prehistoric ornaments of this region have received little attention until recently so the picture we have of both manufacture and use remains very patchy. The most detailed study to date was carried out at the nearby 7th-millennium-B.C. early farming settlement of Barcın Höyük, with an assemblage of more than 700 beads. This assemblage encompasses a wide range of materials and forms, including marine shells and various types of stone, especially artificially colored blue apatite which dominates the assemblage. There is no evidence of mass production, although there is evidence of repeated production in which specific typologies are associated with certain materials. Likewise, although there is not an overwhelming preference for white materials, they are used repeatedly in the form of freshwater- and marine-shell pendants and beads, as well as some marble beads. Some typological trends have been identified, although there are relatively few examples of each type (Baysal 2014).

In addition to beads, bracelets are an important facet of ornamentation practices in the region, specifically within the Eskişehir area where sources of white marble are known to have been exploited extensively at settlements such as Orman Fidanlıği (Ay-Efe 2001) and Kanlıtaş (Baysal et al. 2015). By the Chalcolithic period, bracelet production seems to have been an important activity at these locations and was probably part of wide-reaching networks of exchange that extended through the Aegean and southeastern Balkans (see e.g., Ifantidis and Papageorgiou 2011). Evidence of the reuse of broken bracelets seems to attest to a value system that was not purely economic but that relied instead on some presently unknown, socially attributed significance.

**THE BEADS OF AKTOPRAKLİK**

Spanning both the Late Neolithic and Early Chalcolithic phases, the 13,000 beads recovered from the site of Aktopraklık reveal clear patterns in material choices as well as use. The beads are discussed according to the material from which they are made (stone and shell), but it should be noted that in some cases there is overlap in forms between materials.

**Stone Beads**

White limestone discs constitute the bulk of the assemblage. They are small, less than 5mm in diameter, and have variable lengths (Figure 3). They are not very neatly made; perforations are often off-center and were produced with varying degrees of accuracy. The shape of the beads is often somewhat uneven in both plan and profile. Fairly deep abrasion marks are visible on most specimens. There was no further finishing process. It seems that the nature of the soft limestone made it difficult to achieve a finer surface finish. The preliminary contextual evidence suggests that these beads were intended to be used in large composite items. They are frequently found in groups of several hundred (Figure 4), suggesting that they were produced in large numbers and formed the core of the ornamentation practices at Aktopraklık. It is likely that these beads were produced on site.

![Figure 3. Small white limestone disc beads.](image)

In addition to the many simple, small disc beads are other stone bead forms that appear in much smaller numbers (Figure 4). Indeed, there are both small and larger discs made of a number of materials. These include reddish limestone discs similar in size and form to the white examples and other larger discs of darker colors and harder stones. The use of white stone is also not limited to small discs. White marble was used to produce a number of forms including
flat pierced pebble types, barrels, short barrels, large flat discs, and roughly triangular pendants (Figure 4,b, k-l).

The most distinctive white stone material at Aktopraklık is meerschaum, a very soft and light magnesium silicate that is only found in the Eskişehir region and is commonly used in the modern-day manufacture of tobacco pipes. It was used to make long biconical beads, only a few of which have been recovered (Figure 4,e).

Although the disc beads are usually of relatively low quality, without well smoothed or polished surfaces, some of the stone beads were finished with great care and attention. Among these are basket forms, made from green stones such as jadeite and serpentine, that are very well shaped and highly polished (Figure 5). Some of these beads were used to the extent that the perforation was worn right through. Other beads of much lower manufacturing quality and less regular, although similar, form show a similarity to these. They can be defined as small asymmetrical pierced shapes, not carefully shaped nor carefully finished, but perhaps bearing a general resemblance to the basket form. It may be that the intention behind the shaping of these beads may have been important, and indeed that individual beads, and a bead’s individuality, may have been important in themselves (Baysal and Miller 2016). The extreme degree of wear of some hard-stone examples, as mentioned above, suggests very prolonged use, possibly over the course of several decades or more than one generation.

There are a number of pierced flat pebbles and uneven forms. Some are made from common materials such as marble, others were produced from materials that were probably chosen for convenience, such as grayish shades of limestone, suggesting again that sometimes intention may have been more important than finish. These beads probably represent an expedient technology – the piercing of readily available suitable natural items.

The second largest component of the Aktopraklık stone bead assemblage consists of striking blue specimens with white interiors, seen clearly in broken examples, in a variety of forms (Figure 6). Blue is an exceptionally rare color in archaeological artifacts of the Neolithic and Chalcolithic periods. The surface finish of these beads varies from matte to polished and the color ranges from a very pale washed-out blue to a deep cobalt shade. The most common shape is an elongated and lenticular-profiled barrel form. There are also some shorter versions of this same form as well as disc beads and flat “chip” shapes. These beads are made of fossil ivory or bone (defined geologically as apatite). After shaping a subsequent process was used to produce the blue coloring. It is not yet known how this was achieved, an issue that is discussed in more detail below.

Shell Beads

After stone, shell is the next most common bead material and both marine and freshwater species were in use side by side. It should be noted that isotope analyses of the human remains from Aktopraklık indicate that the inhabitants were not making regular use of marine resources in their diet (Budd et al. 2013), although marine shells were obviously being used as ornaments, which supports the idea of contact with coastal areas.
Shells were used to make beads in a variety of ways. Complete perforated shells contrast with pieces of shell worked into flat shapes and typical bead forms (Figure 7). The simplest are complete marine shells with a hole, either natural or man-made, through the umbo (Figure 7,b), some of which show signs of wear. Likewise dentalia, one of the most commonly used shells of the prehistoric period, were cut into segments and also occasionally used in longer forms. The segments are large in size and very worn.

The changes in the use of marine shells that occurred in the Late Neolithic can be clearly seen in the use of Spondylus – one of the largest shells employed in ornament manufacture in prehistory – to make large barrel and cylinder-form beads (Figure 5,g). The material, which is hard, can be worked in much the same way as stone: drilled from both sides, and abraded and polished so that the end product strongly resembles, and in some cases is almost indistinguishable from, white marble.

Freshwater shells play a newly important role in the later Neolithic and Chalcolithic periods. At Aktoprakh, Unio shells were used to produce pierced shapes (Figure 7,c, e) which emphasize the shiny property of the shell’s inner mother-of-pearl. There are some identifiable repeated forms, although many seem to be somewhat random shapes with one or two perforations. It is likely that these shells were chosen for their large, shiny, and visually arresting surface area, as well as the relative ease with which they could be procured, perhaps from nearby Lake Uluabat.

In addition to these larger shell forms, neat, flat, button-like discs with a single central hole were made from small pieces of bivalve shell. As with the larger Spondylus beads, these are often difficult to distinguish from stone and the material can only be identified upon close inspection.

Overall, the shell beads range from natural forms adapted for use as ornaments to highly worked products in which shell served as a raw material and the finished product was almost indistinguishable from stone. The products also range from small and visually insignificant items, presumably intended for use in combination with other beads, to large, visually striking items that would have made an impact either alone or in groups.
CONTACTS AND THE BEGINNING OF SPECIALIZATION?

A preliminary assessment of the Aktopraklık bead assemblage reveals a number of interesting indications of possible interactions, contacts, influences, and high-volume production that help to link the site to wider ornamentation trends of the Late Neolithic and Early Chalcolithic. Those that can be given special attention here are the clear resemblance of the artifacts to those from other assemblages (e.g., some of the shell items), those that indicate participation in wider exchange networks (the blue apatite beads), and the beads that argue for an increase in the quantity of beads produced (as with the simple, white disc beads).

The blue beads made from apatite that appear in significant quantities at Aktopraklık are a manifestation of one of the largest technological and stylistic trends of the end of the Neolithic period. According to current evidence, these blue beads first appear in the archaeological record around 6400 B.C. and are found at sites ranging from Tell el Kerkh in Syria (Taniguchi et al. 2002) to western Anatolia. The proportion of these beads within each assemblage varies greatly; at some sites such as Barcin Höyük, they form the largest component, while at others they are relatively rare, as at Canhasan I, Çukuriçi Höyük, and Çatalhöyük (Bains et al. 2013). Despite their varying quantities, they are more or less ubiquitous and can be said to have formed a consistent component of individual composite items of ornamentation, as can be seen in examples from Yumuktepe (Caneva 2012). Unfortunately there is relatively little data regarding their use, although some examples from Çatalhöyük suggest they may have been strung in very mixed necklaces with beads of a variety of materials and forms (e.g., see Çatalhöyük Image Collection at www.catalhoyuk.com).

The blue beads appear in a very limited number of forms (Figure 6; also see Baysal 2014) and these are not generally repeated in other materials within the same assemblages, as is the case at Aktopraklık. This suggests that these beads share either a common source or a culturally reinforced expectation about the forms suitable for a blue bead. An explanation for the technical process of their manufacture has remained elusive despite ongoing efforts to identify and replicate their chemical composition (Baysal and Bursalı 2016; Taniguchi et al. 2002). It is certain that a source of fossil bone or ivory as well as knowledge of a particular chemical process was required for their production.

The question of where these blue beads originated, whether in terms of their place of manufacture or the conception of the technology that was necessary for their production, has yet to be answered. As mentioned above, the limited set of forms in which they were made indicates a single source; otherwise a meaning associated with the forms would be the only likely explanation for their consistent similarity. The rapidity of their geographical dispersal suggests networks that had the capacity to carry materials over very long distances in relatively short periods of time. The best known networks of the Neolithic and Chalcolithic are those that distributed obsidian, an easily traceable raw material that was widely used in the production of stone tools. The case for the beads is different for two reasons. First, they are not items with an obvious utilitarian purpose, but may be considered to have had social meaning and uses, perhaps in gift exchange or the display of status, medicine, or magic. Second, a specific source or sources for them has not been determined as yet. Thus, although we can plot the places where these beads were deposited and therefore assess the extent of their spread, it is currently not possible to discuss the reasons for or the direction of their movement, nor the mechanisms of their distribution. It is hoped that precise dating of the deposits which yielded them at different sites, coupled with further excavated evidence from additional sites, will help to answer the many questions about their origins and distribution.

Some other stone materials also contribute to our understanding of wider trends. Meerschaum has a single source in the Eskişehir region and the distinctive long biconical beads found at Aktopraklık have parallels at other sites such as Canhasan I in central Anatolia (Baysal 2016b). This suggests that this material was also used in the repeated production of a specific bead type that was then widely distributed, though apparently in lesser numbers than the blue beads.

The use of Spondylus as a raw material in bead manufacture is less common. Although the use of the shells themselves is widespread, the large bead forms seen at Aktopraklık currently only have parallels at nearby Barcin Höyük (Baysal 2014). The use of Spondylus in beadmaking apparently predates a significant increase in the use of the shells for bracelets or annulets that becomes important in the Aegean, the Balkans, and western Anatolia during the Chalcolithic period. It is uncertain to what extent these two phenomena are related, or indeed whether one is a forerunner of the other.

In contrast, the use of flat mother-of-pearl shapes, with single or multiple perforations, is much better attested with evidence coming from a number of other sites of similar date. As with the Spondylus examples, this seems to be part of the general trend towards larger and more visually striking ornaments after 6400 B.C. While a wide range of shapes is known, particularly from Canhasan I where some exceptionally complex examples were recovered (French 2010:94-97), evidence increasingly supports the idea that
there were some relatively standardized forms among them. “Fin” shapes (Figure 5.a), an asymmetrical form seen in small numbers at Barcın Höyük (Baysal 2014), Canhasan I, and also Suluin (Taşkıran et al. 2016), as well as at Aktopraklık, seem to belong among these recognizable types. These beads are usually made from freshwater Unio shells, a resource that was readily available. The remainder of these shiny flat forms vary from neat geometric shapes such as squares to apparently serendipitous forms, possibly made from broken and water-worn shell fragments. The manner in which these items were used is unknown, though they may have been worn as pendants. Those with multiple perforations may have been sewn onto clothing or other items, a suggestion that is reinforced by the many multi-holed examples from Canhasan I. In either case, their shiny surfaces would have made them an eye-catching ornament.

The prolific use of small white disc beads raises questions about repeated production and possible organized manufacture. “Specialized” production activities have traditionally been associated with the social complexity that rose to prominence in the Bronze Age. There is much debate about the nature of early craft specialization, how it was organized, what were the conditions necessary for it to operate, and whether it constituted a significant, differentiated economic activity (e.g., Costin 1991, 2007). Evidence from the Chalcolithic period now makes it clear that there were significant steps towards organized production earlier in prehistory than was previously thought, and that the process leading to long-term and highly organized specialization was a long one. The non-linearity of the path is marked by occurrences of intensive production that then ended and were replaced by other, often unrelated, activities.

The examples of regular production of certain artifacts from specific materials in northwestern Anatolia at the end of the Neolithic and during the Early Chalcolithic seem to be based on the availability of raw materials that suited the prevalent ornamentation trends. Such resource-based specializations fit well into emerging systems of shared ornamentation practices and aesthetic values that spread across large areas. In the case of the fashion for white marble and shell products, this includes the Aegean region, western and northwestern Turkey, and large parts of the Balkans. This is not to say that the use of white ornaments was the same in all these areas but that there is a marked preference for larger single or composite white items of ornamentation that was shared across a large geographical region. Given that research into the ornamentation of these areas is still in its early stages, the area exhibiting similar preferences is likely to expand.

The nature of prehistoric evidence, and particularly the small number of known production areas, generally makes it difficult to identify how and where manufacturing was carried out. There are, however, a number of suggested examples of specialized production in northwestern Anatolia during the Chalcolithic period, all of which relate to the use of white marble. The bracelet production at Kanlıtaş was so prolific that surface survey was sufficient to reveal the full production sequence through wasters (Baysal et al. 2015) and excavated evidence from Orman Fidanlı also shows a similar intensity of production (see Ay-Efe 2001 for details). It is likely that this intensification of production was not unique to ornaments. Takağlı’s (2005) evidence from Coşkuntepe indicates that querns might also have been subject to some degree of control in procurement and distribution. Likewise convincing arguments have been made for different standards and different levels of manufacturing expertise in ornament production during the late Neolithic (Healey and Campbell 2014), suggesting that different skill levels as well as access to raw materials may have played a part.

While there is much evidence for increased intensity of ornament production in northwestern Turkey, particularly from the Early Chalcolithic onwards, recent data have begun to show that the phenomenon was much more widespread. At the site of Yumuktepe, a complex composite item dating to around 5800 B.C. composed of nearly 1,500 small red and white beads indicates large-scale production and consumption (Baysal 2016a). This again relates to the composite use of large numbers of simple products. The manufacture of artificial enstatite beads later in the Chalcolithic is related to high-volume production as well as new technologies (Pickard and Schoop 2013) and perhaps also has its roots in these earlier manufacturing practices.

Although the presence of high-volume production of beads is well supported, there is a lack of direct archaeological evidence for production centers of these ornaments. This makes it difficult to understand how production was organized and whether households were producing a surplus, or communities were producing for local trade with other settlements. There was definitely a great increase in production of certain types of beads at particular locations. This implies an increase in consumption, the nature of which may be discoverable through the use of raw material source analysis as research progresses. Indeed, it may eventually be possible to identify the distribution patterns of products, even if the mechanisms of movement remain obscure.

**CONCLUSION**

Preliminary assessment of the beads from Aktopraklık reveals that in many respects they fit into the wider trends
of the later Neolithic and Chalcolithic periods. The use of marine and freshwater shells finds parallels at a number of other sites in central and western/northwestern Turkey. It is interesting to note that a community that did not rely heavily on aquatic resources as a food source did employ them for ornamentation purposes. This is reflected in the inland use of marine shells at sites such as Canhasan I where mollusks certainly were not used for nutritional purposes.

Many of the stone beads have local connections and some have direct parallels at a greater distance. There is no doubt that ongoing research will reveal further details of these connections. The blue apatite beads tie Aktopraklık into one of the largest trade networks of the period and the quantity in which they were found places the site among the more intensive users of the products. Coupled with information from nearby Barcın Höyük, this suggests that sites in this region may have had privileged access to, or a preference for, this material.

Less distinct testimony for the inclusion of Aktopraklık in wider regional and interregional trends is the mass production of small white disc beads. Was there specialization in this region during the later Neolithic and Chalcolithic periods? What was the purpose of mass bead production? At the moment the response to these questions depends largely on interpretation, as evidence cannot yet provide us with a definite answer. The manufacture of large quantities of very similar products – stone beads in the case of Aktopraklık and marble bracelets at other sites – suggests that there was an increasing desire for certain fixed types of products in much larger quantities than had previously been the case. The consumption of these products is not yet understood and their role in trade – whether they remained within the settlement in which they were made or moved within networks of economic or gift exchange – remains to be seen.

There are still many aspects of prehistoric beads that need to be explored and many questions remain unanswered. It is clear that in order to understand the changes that occurred in ornamentation practices towards the end of the Neolithic period it is necessary to have a better understanding of the meaning that was attributed to beads and other items by the people and communities that made and used them. Do the beads of Aktopraklık evidence the site’s connectedness? The variety of influences and connections traced in this preliminary study offer much promise, when integrated with data from other assemblages, to formulate an understanding of regional and interregional relationships at Aktopraklık – a geographical and temporal crossroads in prehistory.

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