ACT-FIELD SCHOOL PROJECT REPORTS AND MEMOIRS, II

EXCAVATIONS AND CONSERVATION ACTIVITIES
IN SWAT DISTRICT (2011-2013)
KHYBER-PAKTHUNKHWA – PAKISTAN. 1

THE LAST PHASES OF THE URBAN SITE OF BIR-KOT-GHWANDAI (BARIKOT)

THE BUDDHIST SITES OF GUMBAT AND AMLUK-DARA (BARIKOT)

LUCA M. OLIVIERI

FOREWORD BY ANNA FILIGENZI

WITH CONTRIBUTIONS BY
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PAKISTAN-ITALIAN DEBT SWAP PROGRAM

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Cover: The Barikot hill and surrounding areas seen from Mt. Ilam. River Swat is in the background.
(Photo by LMO, processed by EL)

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VOLUME II

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Ivano Marati and Candida Vassallo

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STUPAS, VIHARAS, A DWELLING UNIT

Domenico Faccenna and Piero Spagnesi



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FOREWORD

ANNA FILIGENZI

The work presented here is the result of some of the activities of the Archaeology Community Tourism (ACT), a three years project, which was born with the aim of integrating into one and the same perspective scientific advancements, knowledge sharing and capacity building.

Financed by the Italian Government through the Pakistani-Italian Debt Swap Agreement (PIDSA), and co-managed with the Economic Affairs Division, Government of Pakistan, this project reflects in its basic features a long history of collaboration between the Italian Archaeological Mission and the Departments of Archaeology and Museums, as well as the traditional friendship between the two countries.

It was conceived as a territory-based project, which does not mean localism but rather innovative pragmatism. When in 1956 Giuseppe Tucci arrived in Swat, he was following a backwards pathway from Tibet. His main aim was the re-discovering of the ancient Uḍḍiyāna, the land from which the great siddha Padmasambhava moved towards Tibet to plant there the seeds of Vajrayāna Buddhism. Behind the legendary accounts there was a rich cultural history to be investigated, of which Padmasambhava just represented the tip of the iceberg. The ancient topography of Swat started to be rediscovered through painstaking – and still ongoing – archaeological surveys and excavations which encompass any physical space where human communities might have left significant traces of their presence, social organisation, and ideological universe.

It is significant that the initial boost to such a thorough territorial archaeology came from outside the concerned territories, as the best evidence of how cultural forms move and connect people across boundaries. This circumstance appears as significant as it ever was now that we are developing a new sensitiveness towards "global history". However, global history is a composite fabric made of interlaced local histories, and only a deeper knowledge of the latter can pave the way for a better understanding of the former. In the same way, the history of religions cannot be reconstructed only through religious monuments and texts. It needs to be seen also from the perspective of the lay society and its private and public spheres of life. Thus, it is not an exaggeration to say that the contents of this publication represent a remarkable addition to all these aspects.

The reader will find here the excavation reports of two different kinds of sites: Bīr-koṭ-ghwaṇḍai (Barikot), the most important urban site so far discovered in Swat, and two exceptional (and so far only insufficiently known) Buddhist sites, i.e. the Great Shrine of Gumbat and the Sacred Area of Amluk-dara.

The excavation reports contain a selection of materials, mainly pottery and shell ornaments, which represent the most conspicuous part of the assemblages. Of the materials from Bīr-koṭ-ghwaṇḍai a complete list and synthetic description is given. The sculptures and coins from Bīr-koṭ-ghwaṇḍai and the sculptures from Gumbat and Amluk-dara will be the object of dedicated studies, which will be hopefully published soon.

The data yielded by these excavations deserve the utmost attention. As for Bīr-koṭ-ghwaṇḍai, we have now a clearer picture of the different building periods, which reflect historical and environmental conditions. Besides, for the first time an urban settlement provided direct evidence of 'Buddhism in context', where overlapping schemes of religious practises and buildings finally open to us a window into the interaction of Buddhism with folk beliefs. From the side of the 'official' Buddhist settlements, the excavation of Gumbat and Amluk-dara provide new insights into building techniques, diachronic changes, and ritual performances. Given the accuracy of the excavation methods, the interpretation of the data can rely on safe stratigraphic contexts, which in turn are connected with a series of precious chronological benchmarks established on the basis of cross-comparison between stratigraphy, numismatic finds and 14C dating.

This will certainly have a bearing not only on the reconstruction of the history of the single sites but also, and moreover, on several critical issues of the cultural history of Swat in general. However, there is another aspect of the project, which can hardly be overemphasised: its direct and immediate impact on the local community. Usually, it takes time before scientific achievements become a shared cultural patrimony. In this case, the needed time has been drastically reduced: the activity on the field has also been an investment on training and capacity building. Thanks to this project, new professionals are now ready to apply elsewhere, sensitive methods of excavation, documentation, restoration and musealisation, others to guard, protect and maintain the sites and to guide visitors, so that they all can actively take part in the promotion of a sustainable tourism.

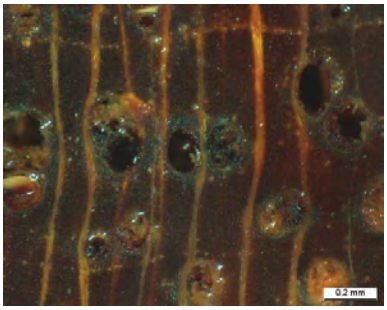
In the end, let us hope that the participation of the local community may result not only in a temporary economic benefit, but in the permanent acquisition of an enriching cultural awareness.

Note on the xilotomic analysis for the wood identification

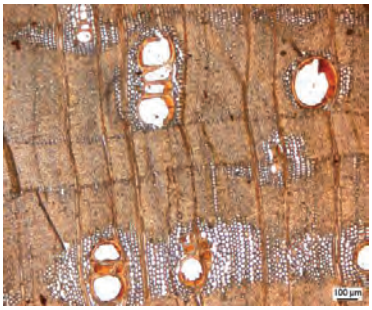
The four load bearing timber elements found in the lower inner dome are important components of its carpentry. They are the wooden joist-like element (called element 4), the three crossed beams supporting the SE corner of the inner ceiling (labelled as elements 1, 2, 3) (see above: Detail of lower inner dome carpentry in situ). Samples of all the elements were taken for anatomical analysis.

Wood identification

In order to identify the species of the timber members, observation of macro- and microscopic features of wood has been carried out. The anatomical examination has been developed on four different specimens sampled one from each beam, labelled as for radiocarbon datation, and compared each other.
The wood identification was carried out with the typical methodology used in the wood anatomy science, according to the IAWA principles (www.iawa-website.org). Thin slices of wood were cut by means of a cryostat microtome and prepared to be observed to the light microscope.
Through the comparison of the four specimens, no significant differences were found, disregarding the natural individual variability, therefore it can be stated that all the analysed beams belong to the species *Acacia modesta* Wall., a hardwood of Mimosaceae Family.
More than 1300 species of the genus *Acacia* have been described all around the world, and twelve in Pakistan (Sheikh 1993). *A. modesta* and *A. nilotica* are very similar, from the point of view of the anatomical properties. Both are native of Pakistan, but in different habitats (Sheikh 1993). On the basis of geographical distribution, the species *A. modesta* has to be considered the most likely choice.
The main microanatomical features of diagnostic relevance are: wood diffuse-porous; vessels with simple perforation plates and shape of alternate pits polygonal; vestured pits in vessels (a particularly noteworthy character); gums and other deposits abundant in heartwood vessels; axial parenchyma vasicentric, aliform, confluent and in marginal or in seemingly marginal bands; larger rays commonly 4- to 10-seriate; all ray cells procumbent; prismatic crystals in chambered axial parenchyma cells.
The microscopic analysis by polarized light microscope showed a high bi-rifrangence of cellulose in cell walls, associated with an excellent state of preservation.



A



B

Fig. 65 - -Cross section. A: element 4, stereomicroscopy. B: element 3, transmitted light microscopy. (Photos by GG).

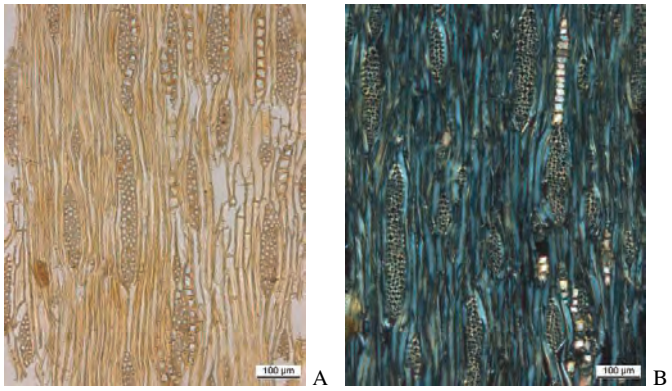


Fig. 66 - Tangential section: element 4, light microscopy. A: normal transmitted light. B: polarized light, that highlights the presence of crystals chains in axial parenchyma. (Photos by GG).

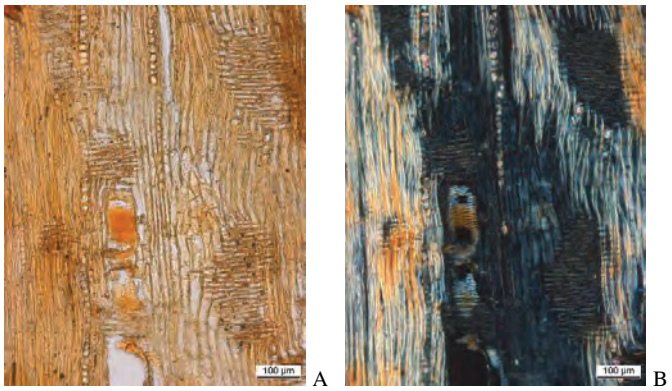


Fig. 67 - Radial section: element 4, light microscopy. A: normal transmitted light. B: polarized light. (Photos by GG).

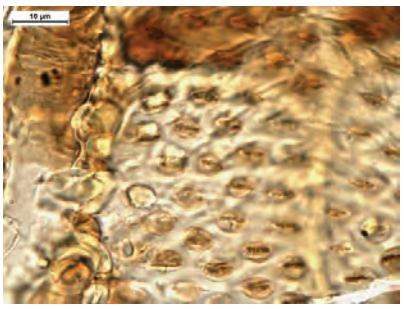


Fig. 68 - Vestured pits visible on longitudinal section (element 3). Transmitted light microscopy at high magnification. (Photo by GDG and GS).

Density of the specimens

As an additional diagnostic element, the density of some specimens were determined. Due to the irregular shape, the volume of each specimen was measured through the buoyant force (according to the Archimedes' principle). Both for the measure of the load of the specimens and of the force generated by the distilled water moved by the body in it immersed, an analytic balance was used.
Results showed a density very similar to the value coming from literature.

Description	Density [kg/m³]
Element n. 1	971
Element n. 2	995
Element n. 3	970
Element n. 4	1003
Reference density (mean value of the species)	
Sheikh 1993	960
Pearson & Brown 1932	993

Tab. 11 - Wood density.

Properties of the species

Common names for *A. modesta* are Phulai and Palosa, depending on the geographic area. As Sheikh wrote, this species is native to Pakistan, Afghanistan, and India.
Nizami (2012) indicated that *A. modesta* is one of the two dominant species in the subtropical broadleaved evergreen forest of Kherimurat and Sohawa with a medium stem density close to 190 trees on one hectare.
In Pakistan it is found below 1200 m in the foothill ranges of the Himalayas, Salt Range, Sulaiman Hills, Balochistan and Kirthar Range and it is also found in the plains close to these mountains. A schematic representation of the growth area is reported in the next *ad hoc* drawing.

Fig. 69 - Map of the natural growth area of *Acacia modesta* Wall. Red dot: site of Gumbat. (Drawings by GS and GDG).

A. modesta is a deciduous, thorny moderate-size tree, 3 to 9 m tall. Diameters up to 2 m have been recorded (Sheikh 1993).
The wood was historically described by Pearson and Brown (1932) as '*light russet with a faint greenish cast, ageing to dark brown, often with darker streaks somewhat lustrous fairly even and straightgrained, medium-textured. It is a strong and extremely hard wood. Certainly the hardest acacia timber examined durable, even in exposed positions, and in contact with water'*. In a more recent description, its properties are summarized as follows: close-grained wood with heartwood sharply distinct from the white sapwood, heartwood is dark brown with typical black streaks (Sheikh 1993).
Wood specimens, mechanically extracted from the beams, exhibit greasy and blackened surfaces, caused by the repeated exposition to the carbon black originated by bonfires lit inside the dome during its long life history (see above: Radiocarbon Dating). Despite the age and exposition conditions, wood shows a very good preservation state so that, a few millimeters under the surfaces, the original natural colour can be observed (figure below).

Fig. 70 - Particular of the sampling point from beam 4, on the SE corner.
(Photos by EL, processed by GG).

This plant has been recognized a significant ethnobotanical value: extraction of leaves, as well as extract oil and gums are used in popular medicine for different purposes. Foliage is used as fodder, fencing/hedge plant and locally as timber: because of its hardness and resistance, it is used in the manufacture of ploughs and other agricultural tool, but also as

roof beams and in the frame of doors (lintels) (Ul Haq et al. 2010; Sher et al. 2012). Many authors described as relevant the use as fire wood (Ul Haq et al. 2010; Tahir et al. 2010; Groninger 2012; Sher et al. 2012).

The wood is very heavy, with an average density close to 1000 kg/m³ (960 kg/m³ Sheikh 1993, and 993 kg/m³ Pearson and Brown 1932). The same authors agreed considering the wood as heavy, hard and very strong, durable even in exposed positions and in contact with water (meaning the heartwood only). The characteristics listed above, combined with the particular colour (described as '*decorative wood'* by Pearson and Brown 1932) and the potential growth dimensions of the trunk, are all favourable reasons for the use as structural timber in the studied building.

As demonstrated by the data collected, the specimens have the mean value typical of the species and they do not indicate any sign of mass lost, notwithstanding the exceptionally long service life.

GDG, GG, GS and MT