

**MONIKA OBERHÄNSLI, St. Moritz, Mauritiusquelle. Die bronzezeitliche Quellfassung.** With contributions by Mathias Seifert, Trivun Sormaz, Jean Nicolas Haas, James H. Dickson, Werner H. Schoch, and Antoinette Rast-Eicher. *Archäologie Graubünden, Sonderheft 6.* Somedia Buchverlag, Chur 2017. € 47.50. ISBN 978-3-906064-92-5. 310 pages with 179 figures and 55 plates.

The mineral spring at St Moritz has been well known in the archaeological literature as a prime example of a prehistoric cult place connected with water for many years, and cited by many authors in that context – the present reviewer included. Until now, however, the sole source from which everyone had to work was an account by Jakob HEIERLI from 1907 [Anz. Schweizer. Altkde. 9, 254–278]; some authors added their own interpretation of Heierli’s account, but in the absence of a modern examination of the material, progress was effectively impossible. Now, with the dismantling of the structure as it was reconstructed in the basement of the Engadiner Museum in St Moritz-Dorf until 2013, and its re-erection in the Paracelsus Forum, there was a chance to study all the surviving material in detail. This task was entrusted to Monika Oberhänsli, then a master’s student at the Institut für Archäologie of Zürich University; the master’s thesis was produced in 2014, the reviewed work is the current, and presumably fuller, version that we have now three years later – remarkably, one of the contributions was actually completed only in the middle of 2017.

The book, which thus aims to present the archaeological world with an up-to-date examination of this extraordinary structure, has fourteen chapters, followed by summaries in German, Romansh, Italian, French, and English; a bibliography, notes, list of illustrations, and a catalogue of the surviving wooden objects. After an Introduction (chapter 1), chapter 2 presents the spring in terms of its chemical and geological / hydrogeological characteristics. chapter 3 gives the history of research, chapter 4 (the longest in the book) a description of the elements of the wellhead. In chapter 5 we are presented with the post-depositional history of the structure, and the finds made in 1853 and 1907. In chapter 6, the construction methods of the various wooden elements are discussed, while chapters 7 and 8 attempt an accurate reconstruction of how the well originally looked and functioned. Chapter 9 provides comparisons for the techniques employed from historical and modern sources, while chapters 10 and 11 give respectively “sacral” and “spatial” contextualisations for the structure. The remaining three chapters, by specialist contributors, cover dendrochronology (12), botanical macro-remains (13), and zoological macro-remains (14).

The installation consisted of two cylindrical wellheads (misleadingly translated in the English summary as “pipes” – these objects are well over a metre in diameter!) made from hollowed out larch trunks, surrounded by an inner wall made of planks and an outer wall in log construction (“Blockbau”). A third and earlier one was subsequently discarded. In addition to that four wooden hooks (presumed to be for lowering buckets into the water) and a notched tree-ladder (“Steigbaum”) were also present. In the mud under one of the cylinders two swords (apparently sticking upright in the mud), a dagger, a pin, and a sword blade fragment were found. These various elements came to light at different times, the bronzes only in 1907.

It has long been clear, and M. Oberhänsli shows beyond all doubt (chapter 3, *Forschungsgeschichte*), that the modern history of the construction is a rather unfortunate one. The mineral spring in question has continued in use up to the present day, with various attempts over the years to isolate the mineral water from groundwater, which dilutes its characteristic taste (and presumably its efficacy). The first record of the spring comes from the 17<sup>th</sup> century, when it was enclosed in a roofed construction. In 1740, a new arrangement was required, and it seems that one of the two cylinders was raised a certain amount at this time (how this could have been done is not clear). A record of the period speaks of the story of a “rotten tree-trunk” from under which the water

rose. In 1853, a new tapping of the spring was necessary; at this stage the rotting upper part of the previously raised cylinder was sawn away. It was in 1907, however, that further work to tap the spring became necessary, and the complete construction was removed, being re-erected in the local museum; the extraction was obviously difficult, since various pieces were sawn in half at this stage, and other damage done to the timbers. Subsequent conservation used Carbolineum (creosote), which has made it impossible to carry out  $^{14}\text{C}$  dating on affected timbers. Various observers gave accounts of the structure, notably the architect Christian Gartmann and the German archaeologist Michael Martin Lienau who was staying at the spa; Chr. Gartmann also produced a model of the construction. At this stage Jakob Heierli, Privatdozent at Zürich University, was called in, but crucially he was not present at the removal of the structure, instead relying on the accounts of those who were, and inspecting the timbers some weeks after they had been extracted. M. Oberhänsli shows that there are many discrepancies in J. Heierli's various accounts and drawings; so much so that the whole issue required a full re-examination, including a detailed examination of all the surviving timbers. Further interventions took place in 1935/36 and 1942/43, but these were concerned with assuring the mineral water supply, not investigating the ancient wellheads. This remained the situation until samples for dendro-dating were taken in 1994, with others following; at this stage a Bronze Age date (as indicated by the bronze finds from under one of the wellheads) was confirmed. Then, in 2012, the St Moritz municipality voted to renovate and extend the Paracelsus spa hall, enabling the transfer of the wells from the cramped museum basement to the hall. This provided the opportunity for a complete re-examination of the structure.

The present book describes all these events in detail, before moving on to a discussion of the various elements of the construction (chapter 4). A presentation of the condition of the various timbers showed that several were affected by wear (water erosion), or brown rot, or both; this actually helped in deciding which timbers had originally lain next to which others. M. Oberhänsli then worked out from the different categories of poles and planks that she identified which timbers belonged to which side of the two surrounding structures (the block and plank constructions). In addition, eleven plank timbers were identified as covering or roofing elements; these had not even been mentioned by J. Heierli.

The two tree-trunk wellheads came from trees that were felled in the same year, very likely from the same tree. A third is fragmentary, and interpreted as the original wellhead, subsequently replaced. All of these objects are the subject of chapter 6, a detailed examination of the wood-working techniques identifiable from the many surviving working traces (many in brilliant condition, as the excellent photographs show). It became clear that adzes were extensively used for the work, which is surprising since few such tools have been found in Bronze Age contexts, in central Europe at least. Details of the joints are presented: chamfering on the block structure, dovetail recesses on the plank. Both these techniques can be commonly found in Alpine countries to this day. Particularly interesting is the discussion of how the cylinders were created, i. e. how one would remove large amounts of wood from the interior of a tree-trunk, even assuming that the centre of the tree was rotten and easily extracted, as seems likely. Experiments showed that adzing in a transverse manner was the only possible way to do it (Fig. 105).

Before considering chapters 7 and 8, a discussion of what exactly the well structure originally consisted of (chapter 7), and a “functional reconstruction”, by phases, of its development (chapter 8), we need to bring in the dating (chapter 12). Initial results from the 1990s were unsuccessful in fixing a chronology, though  $^{14}\text{C}$  dates from Utrecht confirmed that they belonged to the Middle Bronze Age (16<sup>th</sup>–15<sup>th</sup> centuries cal BC). A little later a dendro-date of 1466 BC was arrived at for the felling of the wellhead timbers, and published as such in 2000 (M. SEIFERT, *Vor 3466 Jahren erbaut. Die Quellfassung von St. Moritz. Arch. Schweiz* 23,2, 2000, 63–75); this subsequently

turned out to be 55 years too old, the true date being 1411 BC. In the winter of 2013/14, 85 new samples were taken, the great majority having less than 100 rings but some with many more. The analysis of these samples enabled a median growth curve (“Mittelkurve”) for cylinders, planks, and roundwood to be established.

The cylinders that formed the wellheads probably came from larches 800–900 years old, though a maximum of 135 rings were present (cylinder 3; only 74 from cylinder 2). Though the bark had been removed, the presence of sapwood enabled the researchers to show that nos. 1 and 2 had been felled in autumn-winter 1411–1410 BC, with no. 3 a year earlier (and definitely from a different tree). Of the 32 samples from planks (with up to 406 rings present), eight had rings that lay immediately under the bark and could be placed at exactly the same date as the cylinders; the planks came from trees with two different growing histories (Groups A and B). Of the 51 roundwood poles from the “Blockbau”, 45 could be positioned on the median curve; some pairs of poles came from the same branch, and where the outermost rings were present the dating correlated with that of the cylinders, with some having been cut in summer or autumn, and some in autumn or winter. The ladder also falls on the curve. The median curve of the planks can also be correlated with that from several other Alpine sites, indicating that the later 15<sup>th</sup> century BC was a significant period in Bronze Age history (as known from other parts of Europe).

Finally, using the Eastern Alpine Conifer Chronology, which stretches unbroken back to 8072 BC, the St Moritz sequences were confirmed as falling in the years mentioned. While it was impossible to say if the well was constructed in autumn-winter 1411 (the year when most timbers were cut) or the following spring, it was clear from the presence of the mosses that were used to seal the “Blockbau” that the whole construction was finished in summer 1410 BC.

In chapters 7 and 8, all the various sources of evidence are considered in order to work out what the original form of the well was, and how it developed over time. Given the history, these are complex matters, but M. Oberhänsli wrestles with the sources masterfully, and the reconstructions presented in figures 139 to 141 are surely as close as anyone will ever get to the truth. What it all means is, of course, another matter.

After presenting the details of the construction, M. Oberhänsli gives a brief – too brief, in my opinion – review of the context of the site, both in terms of cult and ritual, and in terms of its geographical situation. The analogies cited are mostly familiar, and mostly from Switzerland or neighbouring areas, with literary references to springs (going back to Horace’s poem “O fons Bandusiae”, Odes III.13) thrown in for good measure. While one would not expect repetition of all that was said about the cultic use of water in the Bronze Age by, for instance, Walter Torbrügge, it would certainly have been worthwhile to explore other examples of wells, most notably Budsene on Zealand (Denmark) (RGA<sup>2</sup> 4 [1981] 91 s. v. Budsene [H. THRANE]), and to consider other tapped mineral water sources – such as salt springs, where recent work has uncovered equally interesting wooden structures of very similar date (A. HARDING / V. KAVRUK, *Explorations in Salt Archaeology in the Carpathian Zone* [Budapest 2013]). The deposition of the bronzes, notably the swords in vertical position, is the main clue to the cultic nature of the site; such a situation is known elsewhere and could have been afforded more attention. What, indeed, do swords have to do with mineral springs? It is this part of the book where the relative inexperience of the author seems most evident. In other respects, her thoroughness shines through.

The volume is nicely produced with large numbers of excellent diagrams and photographs. One minor problem relates to the binding, which is simply glued at the spine, meaning that it is impossible to lay the book open flat: it simply closes up again (perhaps more of a problem for the reviewer than the general reader). Why, when so much effort had been put into the enterprise, a little more

could not have been spent to bind the book properly, is a question we should perhaps direct at Somedia Production of Chur rather than the author or the *Archäologischer Dienst Graubünden*, the sponsor of the book.

These criticisms apart, we should be grateful to all concerned that so thorough an examination of the St Moritz well and so clear an exposition of the work has been brought to fruition. The site is unique, and while its importance has long been recognised, it is only now that we are in a position to appreciate fully its truly extraordinary nature.

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**HEIDE W. NØRGAARD, Bronze Age Metalwork. Techniques and Traditions in the Nordic Bronze Age 1500–1100 BC.** Archaeopress, Oxford 2018. £ 85,– (gedruckte Ausgabe). £ 98,– (gedruckte Ausgabe inkl. E-Book). ISBN 978-1-78969-019-4 (gedruckte Ausgabe). ISBN 978-1-78969-020-0 (E-Book; auch im Open Access verfügbar: <http://archaeopress.com/ArchaeopressShop/Public/download.asp?id={A41BB703-6A31-4C5E-B0F8-17741D75B4E6}>). xii + 500 Seiten mit 290 Abbildungen, davon 244 Farbtafeln.

Seit einigen Jahren mehren sich Studien über Bronzeobjekte, welche die lange Zeit nur wenig beachteten herstellungstechnischen Aspekte in den Blick nehmen und damit u. a. sozialarchäologische Fragestellungen zu beantworten suchen. Die vorliegende Studie wurde 2014 im Rahmen des EU-geförderten Programms „Forging Identities: The Mobility of Culture in Bronze Age Europe“ als Dissertation an der Universität Aarhus, Dänemark, eingereicht und 2018 in leicht überarbeiteter Fassung veröffentlicht. Vorbildlich ist die Publikationsweise, da das Werk gleichzeitig in gedruckter Form zu erwerben ist und digital im Open Access zur Verfügung gestellt wurde.

Generell besticht die Arbeit durch ein detailliertes Studium des Materials, hier bestimmter Schmuckformen, das stets auch forschungsgeschichtlich und theoretisch reflektiert wird. Die Kernfragen betreffen den Menschen bzw. Handwerker hinter den Bronzeartefakten, deren Herstellung erforscht und damit nach Möglichkeit die produzierenden Werkstätten (sowie ihre Einflussbereiche) herausgearbeitet werden. Nicht zuletzt soll dadurch die Organisation des Metallhandwerks in der nordischen Bronzezeit beleuchtet werden. Bei der Beurteilung der technischen Details und Werkzeugspuren kommt der Autorin ihre handwerkliche Ausbildung als Goldschmiedin sehr zugute und ist hervorzuheben.

Die englischsprachige, gut lesbare Arbeit ist nachvollziehbar in vier Teile, jeweils mit forschungsgeschichtlichen Abschnitten, und zahlreiche Kapitel gliedert. Diesen ist – für den eiligen bzw. auswählenden Leser hilfreich – jeweils eine eigene Zusammenfassung vorangestellt. Das Buch ist reich bebildert und generell übersichtlich gesetzt. Die farbigen Fotografien sind in den meisten Fällen gut gewählt und ermöglichen ein besseres Verständnis der beschriebenen technischen Details. Sehr anschaulich ist v. a. die halbe Überblendung von (mehr oder weniger) identischen Verzierungen an verschiedenen Artefakten, um Ähnlichkeiten zu belegen. Die Kartierungen sind ebenfalls in den meisten Fällen übersichtlich gestaltet, allerdings gibt es leider auch einige Karten von schlechter Bildqualität (S. 34–45 Karten 3–8). Ferner sind eine zu einheitliche Farbwahl bei einer Kartierung (S. 311 Karte 32) sowie eine offenbar falsch gesetzte Legende (S. 280 Karte 25) zu beanstanden. Zudem wäre es nützlich gewesen, nicht kartierte Bereiche auch auf der Karte oder in