weise auch gewaltsame Intervention erreicht werden können. Das in dem Bergbaugebiet bezeugte integrierte Bewässerungssystem sei einzigartig in der Levante insgesamt. Auch der Lebensmittelbedarf, den F. für die zur Förderung nötigen fast 1500-2000 Arbeitskräfte und ihre Familien errechnet, sei nur durch eine systematische agrarische Umgestaltung des Siedlungsgebiets zu decken gewesen, zumal sich Luftverschmutzung durch die Kupferförderung noch negativ auf die Ertragslage ausgewirkt haben könnte.


Freiburg

Sitta von Reden


‘Die Säulenbasen des Zweiten Dipteros von Samos’ by Nils Hellner is an excellent book about an investigation carried out with a logical and rational methodology, which enables its author to extract every bit of information from what from the outset looks as a very fragmented and difficult material evidence. It has much more to it than one expects from the somewhat subdued enthusiasm of the title.¹

The author is very familiar with his empirical data. He participated at a young age in the excavations directed by Hermann Kienast in the Heraion in 1989 and in 1994 Kienast entrusted him with the publication of the column bases of the ‘Second Dipteros of Samos’ – formerly often called the ‘Polycrates temple’. In 2002 Hellner submitted the results of his studies as his dissertation at the Technische Universität München. The present book is a thoroughly re-worked version of this basic study.

In the editor’s preface (p. V–VI) Hermann Kienast gives a short introduction and explains that since the temple was first excavated by Theodor Wiegand in 1910–1914 – about a century ago – many scholars have been engaged in the study

¹ The reviewer sincerely apologizes for the delay of this review.
of the temples of Hera at Samos. In particular he emphasizes the work and the
publication by Oscar Reuther and the comprehensive work that Gottfried Gruben (1929-2003) carried out over about 50 years (the work by Gruben is now
(2014) about to be published and it will treat the elevation of the ‘Second Dipter-
وس’ including the extremely interesting capitals). Gruben did not work much on
the column bases and it is argued that this material is better treated in special
study of its own, as has been done by Nils Hellner in the present volume.

After reading Hellner’s book one understands the reason for publishing the
comprehensive material of the column-bases separately, but sometimes it be-
comes a little awkward; for instance when the impact of the bases – not the tem-
ple as a whole – on Greek architecture is discussed. It is evident that neither
Hellner’s book nor the book by Gruben can stand alone no matter how good
they may be in their own.

The Introduction (‘Einleitung’ p. 1-4) is a short and concise description of the
geographical position of the Heraion on the plain facing the Mycale promontory
and the Maeander valley on the coast of Asia Minor. The sanctuary is located on
low, marshy land next to the mouth of the Imbrastos river. Hellner describes the
development of the sanctuary, its buildings, altar and rich votives that reflects
the international relations of Samos in the Archaic period. The large building
projects at the great sanctuaries of Samos, Ephesus and at Didyma by Miletos are
compared and differing theories on their chronology are related in the notes.
Unfortunately the description is accompanied by neither photos nor maps and
plans.

As Andreas E. Furtwängler and others have pointed out, the person named
‘Rhokos’ was probably the architect of the ‘Polycrates temple’ and Hellner
therefore chooses to designate the two successive temples of Hera at Samos as the
‘Dipteros I’ and the ‘Dipteros II’ instead of the ‘Rhokos Temple’ and the ‘Poly-
crates Temple’.

Chapter one, ‘I. Zusammenfassung des Forschungsstandes und Fragenstellun-
gen’

This chapter presents a very useful summary of the history of the excavations of the
temple of Hera with emphasis on the period after Oscar Reuther and it
takes the reader to the stage, where the present investigation begins.

Among the results of previous research some important details may be emphasized. The
‘Steinplan’ by O. Reuther still serves as the general plan of the temple. The excavations of
1989 proved that the First Dipteros was dismantled ca. 530 BC presumably due to prob-
lems with the stability of the foundations. The construction of the Second Dipteros was
initiated immediately after re-using a lot of the poros building stones from the old temple
especially in the foundations. The excavation of 1989 also explained the apparent absence
of foundations for interior columns in the cela and it was concluded that the cela had
been furnished with two rows of interior columns founded on shallow foundations resting
on layers of sea sand.

The chapter presents a detailed outline of the construction phases during the
entire period from ca. 530 to late 4th century BC based mainly on the study of the
foundations done by earlier scholars. As Hellner in his study manages to divide
the column bases into a number of groups and to attribute each group to a cer-
tain section of the foundation, the relative chronology of the individual sections
of the foundations established here comes to play an important role for his investigation.

In chapter II (‘Die samische Basis’ p. 13–21) the constituent parts of the Samian basis are described and the terminology – in German, of course – of all the details is explained.

The terminology is essential for understanding Hellner’s account of his analysis. The horizontal flutes are called «Kanneluren», the flat bands or taeniae separating the horizontal Kanneluren are called «Stege» and these can be plain or have a narrow groove, a «Kerbe». Above and below the fluted area of the spira there is a plain, flat border, «Spiraranb». The underside of the spira has a chamfering, an «Abfasung» along the outer border to prevent splinters of the stone to break off during handling.

These are the main features that are found on all bases, but with small variations from one group to the other. By analyzing these details and also taking variations in dimensions and material into consideration Hellner is able to identify 13 groups of spira and 8 groups of tori out of a total of 592 pieces and fragments. He is also able to evaluate the approximate, relative size of each group according to the number of fragments that can be attributed to the group.

On the foundations of the Second Dipteros 7 spiraie are preserved in situ spread over the entire foundation. Unfortunately Hellner shows no photos of these. As each of these spiraie belongs to one of the 13 groups that have been identified by Hellner, most of the 592 fragments can be attributed to specific parts of the building. When this is combined with what is known about the capitals and the column shafts it becomes possible to create a picture of the elevation of the temple at different stages of its history.

The chapter discusses the method of the investigation in detail. Particularly interesting is the description on how all the fragments were measured and their profiles drawn. The very detailed measures of every feature in the profile are indicated systematically on a line running parallel to the drawing of the profile and this facilitates very much comparison between the pieces. This may look a little overdone, but it is necessary for the subsequent analysis and organizing of the fragments into well-defined groups.

Chapter III. ‘Die Ordnung der Spirend und ihrer Fragmentes’ (p. 23–88) has a detailed description of each group of spiraie listing its characteristic features.

They are first distributed in groups according to material: poros, white marble or greyish-blue marble. Within each of these they are subdivided according to dimensions and to specific features of the profiles. In this way 13 groups of spiraie are defined and it is suggested to what part of the temple each group belonged.

In Chapter IV. ‘Die Ordnung der Toren und ihrer Fragmentes’ (p. 89–124) a similar analysis is carried out on the fragments of the tori, but with more difficulty as only 3 tori are preserved well enough to have their entire profiles drawn.

All tori are worked in one piece with the lowermost column drum. The underside sometimes has traces of the anathyrosis preserved. The horizontal flutes of the tori may meet in a «Grat» – a sharp arris (as in a Doric column) or in a «Stege» – flat band (as in a Classical Ionic column shaft). Like the spiraie, the tori are organized according to material and next according to dimension of the diameter and to details of the profile. It is remarkable that in the group of tori there are thirteen times as many fragments of white marble as of greyish-blue marble while there are only about twice as many of white marble as of greyish-blue marble in the group of spiraie. This indicates that white tori were often used in combination with greyish-blue spiraie – as in the column still in situ.

In Chapter V, ‘Die Formale Entwicklung der Profile’ (p. 125–132) Hellner establishes a typological development of the spiraie and the tori of the temple.
As the spira of group \( \text{Sp}_1 \) from the cells are dated to ca. 530 BC, the spira of white marble from the east front of the temple dates to the beginning of the 6th century BC and the spira of greyish-blue marble from the west side of the temple to late 4th century BC. It can be observed that they go through a gradual development (Abb. 8). Among the general features can be emphasized that while the early spira are almost cylindrical in shape the profiles of the latest describe a distinct concave curve.

In similar way a typology of the torus can be established (Abb. 10). The profile of the early torus describes a simple semicircle so that the largest diameter of the torus is at the middle of its height. The largest diameter of the latest tori, however, is well above the mid-height of the torus and the curve of the profile is thus a composite one.

VI. ‘Die Zuweisung der Toren zu den Spiren’ (p. 133–137).

The connection of the different groups of tori to specific groups of spira is difficult and mainly based on the dimensions of their diameters and on the assumption that the greatest diameter of the torus never surpasses the upper diameter of the spira.

Then follows the complicated but important chapter VII. ‘Die Standortzuweisung der Basen’ (p. 139–156).

In agreement with the reconstruction by Reuther it is assumed that the second Dipéroso of Hera had 155 columns. The 13 groups of spira are placed on the plan of the temple in groups according to the corresponding spira still in situ sometimes supported by other arguments. The first group, \( \text{Sp}_1 \) of poros is placed in the cells following an argumentation by Gruben, which the reader however only follows with difficulty as the book by Gruben has not yet been published. This constitutes the first construction phase, ‘Bauphaser’ at about 530 BC. Hellner holds the opinion that the foundations for the inner peristasis followed very soon after in a second part of Phase 1.

The foundations for the columns of the pronaos were dated by Kienast to ca. 500 BC by the pottery finds, which is later than the foundations for the inner peristasis, and thus should indicate the beginning of Phase 2. The foundations of the middle and outer row of columns to the east and west are of poros and contemporary with the foundations in the pronaos and later than the foundations of the inner peristasis. They contain a lot of discarded and unfinished column drums of poros perhaps indicating that a change of plan was made at this time as well as a decision that the columns at the front should be entirely of marble.

In the first part of Phase 2 the spira-group \( \text{Sp}_2 \) were placed in the pronaos and \( \text{Sp}_3 \) and \( \text{Sp}_4 \) were placed in one out of two possible ways (Bauphase 2, Bauabschnitt I (Hypothese 1) and Bauphase 2, Bauabschnitt I (Hypothese 2)) on the east front of the temple.

In a second part of ‘Phase 2’ the spira of group \( \text{Sp}_5 \) with a small diameter could have been placed on the inner peristasis to the north and south along the easternmost part of the cells (Abb. 14 and 15). 12 spira of group \( \text{Sp}_6 \) with a large diameter could have been situated either as the outer row of columns along the entire east front of the temple or according to which hypothesis is correct in relation to the placement of \( \text{Sp}_4 \) in groups of 6 in the northeast and the southeast corner of the temple (Bauphase 2, Bauabschnitt II (Hypothese 1) and Bauphase 2, Bauabschnitt II (Hypothese 2)).

Next follow discussions of the construction details of the stylobates in the inner peristasis, the pronaos and the outer peristasis. It is argued that the interaxial distance between the two central columns on the east front was smaller than those next to this (8.21,6 m to 8.49,7 m) and that a theory by H. Büsing thus had to be rejected.

Abb. 17 indicates ‘Hypothese 3’, which combines two of the preceding hypotheses. According to this the entire porch of three rows of 8 columns on the east front of the temple would have spira of white marble. All tori attributed to these spira are assumed to be of white marble too.

Still in the ‘Phase 2’ follows a third construction segment (‘Bauphase III’, Abb. 18) comprising spira-groups \( \text{Sp}_9 \) and \( \text{Sp}_{15} \), of which \( \text{Sp}_{10} \) is the spira which is still in situ with its torus and its column in about half of its original height. Both are of greyish-blue
marble, while the tori attributed to these (as well as their columns) are of white marble. Hellner suggests that the spirae of group Sp 9 were placed in prolongation of Sp 10 to where the foundations change and become narrower. He suggests that the columns on the outer part of the peristasis to the north were erected until the same change in the foundation-width on that side and that the columns in the inner row of the peristasis on both the north and the south side of the temple were erected until the same length.

This is very important because the entire east part of the temple would thus have been finished at the end of Phase 2 and covered with a roof. It may also have been equipped with a monumental stair on the east front as wide as the cela by this time. If this is correct, which seems plausible, this is how the Heraion would have looked during the entire Classical period.

Construction phase 2 is believed to have ended by the beginning of the Early Classical period, and it is assumed that no construction-work took place at the Second Dipteros for another ca. 150 years.

Then follows a construction phase 3, «Bauphas 3», which includes the groups Sp 8, Sp 11, Sp 12 and Sp 13 and the tori attributed to these. In this phase both the tori and the spirae are of greyish-blue marble and they can furthermore be identified by a particular delimitation of the fluted area of the spirae upwards and downwards.

Hellner places the spirae of the group Sp 11 with a small diameter of just ca. 1.80 m on the narrow outer foundation to the south of the cela, whereas the corresponding narrow foundation to the north carries Late Antique remains and probably never had columns. It seems possible that spirae of group Sp 11 were also placed in the inner peristasis both on the north and the south side of the cela and thus completed the inner peristasis.

Finally the groups Sp 8, Sp 12 and Sp 13 probably belonged to the columns of the middle and the inner row on the west side of the temple.

Phase 3 is believed to have taken place in the last quarter of the 4th century and to have constituted the last major building phase on the Second Dipteros of Hera. This is how the temple would have looked during the Hellenistic and Roman periods. The only significant change was the addition of a wide, monumental stair of marble along the east front of the temple at the time of Augustus, phase 4. As the stair ran along the entire front of the temple it must be presumed that the east front of the temple was still standing with all its columns at this time, 430 years after it had been constructed.

Chapter VIII. ‘Die Herstellungstechnik der Basen’ (p. 157–170) discusses the fact that spirae and tori from all construction periods have clear traces showing that these were ornamented with flutes by being turned on some kind of turntable, torno, a method that according to Pliny was invented by Theodoros from Samos.

As the technique has been discussed in detail by Christof Hendrich in relation to the first Dipteros of Hera on Samos, Hellner does not go into detail with the reconstruction of the turn-table.1 Some reflections would have been welcome concerning the tori, which were in one piece with the lowermost column drum. Then follows a catalogue of traces from the turning of both spirae and tori. Some reflections are presented in relation to how the different elements were indicated by incision and there are some reflections also on the measuring unit. Because of the production method the bases vary quite irregularly on sizes and no Samian foot size can be safely recognized.

Chapter IX. ‘Die samische Basis: Herkunft und Verbreitung’ (p. 171–173) is a very brief chapter summarizing various views on the early development of different variations of Ionic bases.

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Hellner shares Gruben’s view that the Samian basis is developed from the Cycladic Ionic bases. The chapter has a useful collection of drawings showing profiles of Samian bases from various locations (Abb. 23 and 24).

In chapter X. ‘Der Vergleich mit weiteren samischen Basen’ (p. 177–200) Hellner discusses in some detail Samian bases from a number of locations: A. Delos, B. Halikarnassos/Bodrum, C. Lokri, Maraza, D. Metapont (temple D), E. Myus, F. Naukratis, G. Phanai/Chios, H. Syrakus. It is concluded that the Ionic temple at Syrakus was probably built by Samian craftsmen and this may be the case also for the temple at Naukratis.

Hellner reflects on whether the invention of the Samian basis and the development of its particular form and ornamentation was a result of traditional method for working in wood being transferred to poros and marble, and he suggests that the reason that it was given up in favour of the Ephesian basis was that the technique of turning big architectural pieces of stone on a lathe was not well-suited for marble. These reflections seem to have been better suited for chapter VIII or IX.

Chapter XI. ‘Zusammenfassung’ (p. 201–205) draws up a very welcomed summary and conclusion to the complicated investigations.

From 585 fragments of spirae and tori, it was possible for Hellner to reconstruct 62 spirae and 45 tori in addition to those known before. Among these it was possible to reconstruct a relative chronology for the development of the Samian spira and torus. Chronological fixpoints could then be established in two ways. Firstly by relating the spirae still in situ on the stylobate to the previously established chronology of the different sections of the foundations. Secondly, by relating the spirae still in situ to the column capitals that have been attributed to these column bases by Gruben and dated by Gruben (apparently on stylistic criteria).

Based on this chronological framework the specific column-bases can be attributed to each of the four main construction phases that have previously been established for the Second Dipteros of Hera:

1. Around 530 BC the old temple, Dipteros I, was dismantled and its material to a wide extent reused for the early parts of Dipteros II. The cella was constructed with interior columns primarily of poros and was furnished with a roof. A few bases and columns were of marble.

2. After a break construction work was resumed about 500 BC and continued for about two decades. First the foundations for the pronaos columns and the inner peristasis were built. It was then decided that the columns from here onwards should be of marble and many columns of poros were discarded and used for the foundations of the outer peristasis. Late in this very comprehensive phase of construction white marble apparently became scarce and a greyish-blue marble was introduced and used for some spirae.

When construction stopped by the beginning of the Early Classical period the entire east façade of the temple was probably finished up to and including the 7th columns on the flanks counted from the east. The façade and the cella were furnished with a roof and a monumental stair was constructed on the front as wide as the cella. This is how Herodotos saw the temple about 470 BC and how it must have looked for the next ca. 150 years.

3. When the Samians returned in 522 BC after having been expelled by the Athenians since 565 BC, they took up construction work to finish the temple. Both the bases and the columns were of greyish-blue marble in this phase, and the spirae now had a slightly different profile. Work in this last building phase completed the erection of columns in the inner peristasis on the western part of the temple, the middle row of columns on the west side of the cella and in the outer peristasis on the south side. The outer row of columns on the north and on the west was probably never built. This is how the temple must have looked until the beginning of our era.
During the general rise in activity in the sanctuary at the time of Augustus the entire east facade of the temple was embellished with a monumental marble staircase running along the entire east front of the temple.

Conclusion:
The work by Nils Hellner on the column bases of the Second Dipteros of Hera is a strict and systematic work. The degree of detailing in the analysis may at times seem extreme, but it all contributes to the final result. Although the author is in some cases left with 2 or 3 alternative hypotheses I doubt that anybody could reach more safe results on this empirical material than Hellner has done. This study may not change our views on ancient Greek culture and architecture dramatically but factual knowledge of Greek architecture has advanced a step by Hellner’s hard work.

There are however a few cases to comment.
Illustrations. The illustrations are generally of good quality, especially the section-drawings, but they are too few. There are no general overviews and no plans in relation to the description of the landscape and the sanctuary of Hera and there are no photos of the very important spirae still in situ and not even of the only column still standing with spira, torus and column in place.
Chronology. Concerning the important issue of chronology, it is not easy to follow the author. This is mainly due to the fact that in chronological questions the author often refers to works by other scholars, in particular the very comprehensive investigations by Gruben, which have not been published in detail yet. A general chapter dealing with chronology might have been useful. This reader had difficulties finding out when the large 2nd construction phase is supposed to have ended, and even more on what evidence the 3rd and final construction phase is dated to the last quarter of the 4th century BC.

The decision to deal with the column bases of the Second Dipteros separately from the capitals and the superstructure in general has had a price. This becomes evident when Hellner investigates the use of the Samian base at other places and tries to explain this in a historical context, which is of course extremely interesting. Hellner has 8 examples of Samian bases from the coasts of the eastern Aegean to Magna Grecia, Sicily and Naukratis. But the influence of the Second Dipteros was far greater than suggested by these 8 examples. In some cases capitals are preserved and the bases are not or are of the Ephesian type. If one takes the capitals into consideration one sees that the influence of the Second Dipteros was far greater than indicated by these 8 examples. And more important: one also sees the influence of the Second Dipteros at periods, which are not reflected by the existing bases and therefore escapes the attention of Hellner. For instance it seems that the architects of the Hekatomnids must have been inspired by the Second Dipteros in the first half of the fourth century. This is reflected both in the large anthemion decorated column from Halikarnassos (of which the base is not known), and reflected also by the decorated capitals of the Andrones at Labraunda (which had bases of Ephesian type).¹

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Although Hellner does not claim to have treated the impact and influence of the Second Diperos on Ancient architecture in full, some readers will probably be a little disappointed by the very restricted historical outlook.

Notwithstanding these few reservations the general conclusion is that this is an excellent book about a very strict and clever architectural investigation on one of the most important temples of the Classical world.

Odense

Poul Pedersen


Erschienen als Band 17 in der von Mario Torelli herausgegebenen Reihe ‘Materiali del Museo Archeologico Nazionale di Tarquinia’ ist das Buch von Valentina Vincenti (V.) zugleich das zweite, das die abgenommenen Malereien eines Kammergrabes behandelt.1 Beginnen als ‘tesi di Specializzazione in Archeologia‘ entwickelte die Verfasserin aus ihrer Arbeit über Jahre diese umfassende Monographie.


Das Buch ist sehr übersichtlich in sechs Kapitel gegliedert. Zwei Anhänge geben das gesamte Archivmaterial und den bei der Abnahme der Fresken erstellten

1 Zur Tomba della Scrofa Nera s. S. Stopponi, La Tomba della Scrofa Nera (Rom 1983).
2 AnnInst 38, 1866, 422-442 MontInst VIII, 1864-1868.

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