

LIGHT-WELLS IN CLASSICAL GREEK HOUSES?

IN a recent study published in the *B.C.H.*, LXXX, 1956, pp. 483-506 Mrs. Vanna Svoronos-Hadjimichalis has reconsidered the problem of the evacuation of smoke from the kitchen of the Classical Greek house, represented in actual remains almost exclusively by the houses excavated at Olynthos between 1928 and 1938.

Particularly valuable is her first-hand acquaintance with the modern Greek house and, although she is unable to adduce any close analogies to the "pillar-partition" so characteristic of the Olynthian kitchen, she does illustrate smoke-vents in the sloping tile roofs of houses at Hagia Anna in Euboea and at Hellinopyrgos in Thessaly (*op. cit.* fig. 5a, b) which bear a remarkable resemblance to the form I proposed as a reasonable one on purely theoretical grounds in the original study of the question in *Olynthus*, VIII (pp. 194 f. and p. 99 fig. 4), and to which I later noted analogies in Swiss houses of recent times in my article in *Hesperia*, XXIII, 1954, pp. 328-346, especially pp. 345 f.¹

It is encouraging to me that she accepts my general position in regard to the interpretation of the kitchens and of the pillar-partitions as set forth in the *Hesperia* article, and even in such details as the draft-holes in the lower part of the flue.²

The principal new point Mrs. S-H. attempts to demonstrate in her article is the following: that the large flue (II) over the fireplace of the Olynthian kitchen-complex had, instead of a rather small covered smoke-vent at the top—as I had pictured it and to which, as I have said, she has found modern-Greek analogies—, a clerestory covering the entire area of the flue and serving not merely to evacuate the smoke but to admit light both to the kitchen at the bottom of the flue and, more particularly, to the large adjacent room (I) separated, in the characteristic scheme, from the kitchen flue (II) by a row of four pillars, the "pillar-partition." This would mean in effect that the principle of the light-well, so common in Minoan Crete, was also in use in Classical Greece, a conclusion which merits careful examination.

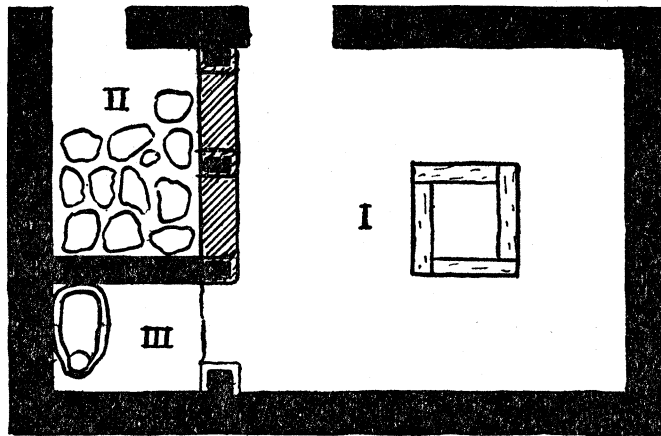
As a corollary of this Mrs. S-H. suggests in her study (p. 499, note 1) that similar clerestories—whose existence can be traced in the remains only by the characteristic row of stone bases fronting the hypothetical "light-well"—may have been used to light rooms other than the kitchen-complex, and that this explains the dis-

¹ Mrs. S-H. is not correct in saying that my inspiration for the form of the smoke-vent came from these Swiss houses (p. 490 note 2) since my discovery of the Swiss analogy came some fifteen years after the original publication. She also takes exception to my citing analogous hearth forms from 17th century (not 7th century, as Mrs. S-H.) Norway rather than from ancient Greece (p. 497 note 2); but the latter had already been cited in *Olynthus*, VIII, pp. 187 f.

² *B.C.H.*, LXXX, 1956, p. 492; *Olynthus*, VIII, p. 195.

agreement between Prof. Mylonas and myself on the identification of certain of the rooms of the pillar-partition.³

The structural resemblance of the Olynthian "pillar-partition" and the rectangular space beyond it (II) to the typical Minoan light-well is indeed rather striking and was noted, as Mrs. S-H. mentions (p. 499), in my article in *Hesperia* (pp. 333 f.).⁴ One significant difference, however, is the regular presence in the Minoan form of a drain, and the complete absence of one in the Olynthian. This must mean that the former must have been open to the sky, the latter protected in some way; and that is of course why Mrs. S-H. introduces the idea of a clerestory arrangement above II.⁵



Mrs. S-H. does not specifically mention the obvious fact that the covering of the "light-well" would limit the amount of light it could transmit and therefore would be less efficient than the Minoan light-wells if they were really completely open to the sky. To measure as closely as possible the amount of light reaching the large room (I), or "Common Room" as Mrs. S-H. calls it, under different conditions I constructed a scale-model (at 1:25) in plywood of the whole kitchen-complex and the

³ See the *Hesperia* article cited above, *passim*.

⁴ In the final version of my *Hesperia* article I suppressed the following note. "There is a superficial resemblance in plan to the familiar 'light-wells' of the Minoan palaces, but there are so many objections to such an interpretation that it would be a waste of space to discuss the idea (evidently I was wrong!); to mention one of the less obvious: if light-wells, why partially close the space between the pillars with an adobe wall on the ground floor, as clearly in the Villa of Good Fortune. Light may however have been a secondary consideration. Some Swiss kitchens received very little natural illumination except by way of the opening in the roof for the smoke, cf. Brockmann-Jerosch, *La terre helvétique* (French edition, 1931), p. 85."

⁵ Mrs. S-H. suggests indeed that the projections on the top of some of the houses ("roof-attics" as Evans calls them, *P. of M.*, II, p. 370) of the Knossos "Town Mosaic" are covered light-wells, but this is very uncertain; it is possible that, as she says, they formed the enclosure for stairways leading to the flat roof.

room and roofing above it.⁶ A photographic flood-light was moved close enough to the model to give an effective illumination approximately equal to that of the sun on a clear day, and readings were taken with a sensitive light-meter through a suitable aperture in a wall of **I** not facing **II**.

With a movable piece of plywood set in a position in the model corresponding to a section of roofing in the original house raised about 65 cm. above the general roof level⁷ and covering the opening over **II** results not unfavorable to the hypothesis of Mrs. S-H. were obtained. With the "sun" in a mid-morning position—the most favorable position for it to shine obliquely into the "light-well" through the openings of the clerestory—the illumination in **I** with the roof of the clerestory removed was only about 50% greater than with it in place; with the sun in a midday position the lighting with the roof removed was about eight times as great as with it in place, but this only means that under such conditions the sun would shine directly down the shaft, flooding both **I** and **II** with light, and incidentally with unbearable heat in warm weather. In the midday position, and with the roof in place, **II** was still fully as strongly illuminated, if not rather more so, than in the mid-morning position. In any case we can only conclude that with a bright sun during most of the day room **II** would have been adequately lighted. We must not expect modern standards of illumination, and in dull weather or late in the day we can only suppose that the light of the fire or of lamps served the purpose, however inadequate *we* might consider it.

Mrs. S-H. seeks to bolster her case for the light-well by quoting (p. 502) a passage in Herodotos,⁸ often cited in this connection, which speaks of the sunlight coming through the "kapnodoke" and shining on the floor of a room in a Macedonian palace; it is perhaps significant that it is called a "smoke-" not a "light-" receiver. In any event, even if this passage can be literally transferred to a Greek house, it only proves that the sun *could* shine through the flue-opening, not that the flue-opening was *intended* also as a source of light. And a shaft of sunlight *could* find its way through a flue-opening of the kind suggested in *Olynthus*, VIII and the article in *Hesperia* as well as through the larger opening advocated by Mrs. S-H.;^{8a} if we

⁶ Only in one-third of the Olynthian kitchen-complexes is the full length of the flue (**II**) open to the large room, since in the others one end of **II** is occupied by a bathroom (**III**). On this point Mrs. S-H.' drawings in her fig. 12 are quite misleading for **II** has been given the proportions of **II** and **III** together and four pillars instead of three.

⁷ The unscaled sketch in fig. 12 of the article by Mrs. S-H. approximately agrees with this hypothetical estimate.

⁸ Herodotos, VIII, 137.

^{8a} That a relatively small, well-protected opening was preferred, even for admitting light, in the classical period is suggested by recent discoveries at Pompeii. Spinazzola (*Pompei alla luce degli scavi nuovi di via dell'Abbondanza, 1910-1923* [1953], figs. 52, 57) illustrates two such openings observed in houses II ii 4 and IX xii 6; the first he describes as "una apertura rettangola, protetta da un gran cappuccio fatto di due tegoli combacianti di terracotta, che, impendendo il passaggio delle

wished to make a point of it we could claim that the smaller patch of sunlight actually fits the circumstances of the story better.

As another argument for the larger opening Mrs. S-H. advances the claim that with an opening as small as I have advocated the draft over such a large flue would be nearly non-existent (p. 497). But since the roof at the top of the flue was always a sloping one a hole of reasonable size near or *at the highest point* (as I have always restored it) should draw off the smoke efficiently; actual experiment with the scale-model confirms this supposition. Moreover if this opening is hooded (as in my restoration) the smoke will not be blown back into the flue and the room beyond except when the wind is coming from the direction in which the flue-vent faces; on the other hand with a clerestory open all around, as suggested by Mrs. S-H., a considerable breeze from any direction will cause the smoke to baffle back into the flue. A little experiment with the blast of air from a hair-dryer directed against the model shows that this is true.

Another objection to the large clerestory opening—and my principal reason for having from the beginning suggested as small an opening as possible within the limits of reasonable efficiency—is that it would admit a great deal of cold air in the winter season (and this can be quite severe in the Chalcidic peninsula), while a driving rain from any direction could hardly be prevented from sending quantities of water on to the hearth immediately below.⁹ A small hooded vent, such as I would advocate, would be much less vulnerable to rain and could even be closed by a hinged cover operated from below.¹⁰

Mrs. S-H. further declares that the use of the pillar-partition instead of a solid wall to separate **I** from **II** was to make **I** and **II** interdependent and to provide air and light for **I**. I would agree as to the interdependence, but would suggest that the principal reason was rather to allow the heat to radiate from **II** into **I** in order to keep **II** cooler in hot weather, and **I** warmer in cold weather.

As for the lighting of **I**, which seems to be of such concern to Mrs. S-H., it is I believe clear that windows were in regular use on the ground floor of the Olynthian houses.¹¹ Her statement (p. 499) that the kitchens could not have had other openings than the doors (which moreover opened usually on porticoes and not directly on the court), since they were located in the interior of *insulae* far from the exterior walls, conveys a very false impression. At least one wall of the kitchen-complex was always

acque, permetteva che un po' di luce scendesse dall'alto sull'ingresso, immediatamente sottoposto." The restoration shown in his fig. 57 closely resembles my original theoretical restoration referred to above.

⁹ This would certainly be true on the restoration suggested by Mrs. S-H. in her fig. 12; the amount of rain-water penetrating the flue could be somewhat reduced (and the light too) by extending the area of the roof covering the "light-well" beyond the limits of the shaft.

¹⁰ Cf. my *Hesperia* article, pp. 345 f.

¹¹ *Hesperia*, XXII, 1953, pp. 199-203.

an exterior wall or adjacent to a court. It is true that at times this exterior wall was next to an alley some two meters wide running down the middle of an "*insula*," but it is my belief, based on a study of the "alleys" between the individual houses in Row A on the North Hill of Olynthos as well as of those in the regular ten-house blocks, that although they were used for drainage their primary *raison d'être* was to serve as light areas so that the main block of rooms of both storeys in the north half of the houses could be provided with windows. As I have pointed out before, these "alleys" were not actually used for passage since they were blocked by walls at their ends;¹² windows could therefore open even more freely on them than on the streets.

The other rooms on the ground floor also had to depend on windows and doors for their light and there would seem to be no convincing reason for equipping the kitchen-complex with a special system of lighting. Tasks requiring much light could be performed in the porticoes or court when the weather was good; bad weather was a serious handicap to daily living before the invention of window-glass and electric lights!

Lastly, let us consider Mrs. S-H.'s suggestion (p. 499, note 1) that the hypothetical light-well was occasionally used in combination with rooms other than **I**, in other words that it was not itself always a kitchen (**II**). Against this is the consideration, already pointed out in detail in the *Hesperia* article (p. 338), that the room-complexes which have been separately classified by Mylonas (and it is these she has in mind) are really indistinguishable from the kitchen-complexes.

In any case one might suppose that the Olynthian builders would only have troubled to provide a light-well for rooms of some importance. Yet this is far from the truth; for example, the one outstanding room recognizable in the Olynthian house—the andron—is never so equipped. Nevertheless let us examine the six houses where we might most reasonably expect to find evidence of this room group's being used, according to Mrs. S-H.'s hypothesis, for some other purpose, for Prof. Mylonas has already assailed my position on the ground that such comparatively small houses as the Olynthian would not contain two kitchen complexes.¹³ These are the six houses in which *two* of the **I-II** (**-III**) complexes occur: A iv 9, A vi 7, B vii 2, F -ii 9, A viii 2, and the Villa of the Bronzes.

In A iv 9, *jk* certainly constitutes a kitchen-complex since a hearth was found in *k*; but *c*, the large room (**I**) of the other group, was a mere kind of entrance-hall with perhaps a stairway to the upper floor. In A vi 7, it is the room *next* to the main room (**I**) of the secondary complex which has a cement floor and red-stuccoed walls; *c* (**I**) itself is plain and unadorned. Again in B vii 2 the large room, *c* (**I**), is plain, though the other rooms are the same in this house; but *a* (**I**) of F -ii 9, the "House

¹² *Olynthus*, VIII, p. 37.

¹³ My reply is given in *Hesperia*, XXIII, 1954, pp. 338-340.

of Many Colors," is plain while all the better rooms were carefully decorated (*Hesperia*, XXIII, 1954, p. 338). In A viii 2, *d* (I) is one of the plainest rooms in the house. Finally, *b* (I) of the Villa of the Bronzes does indeed have a simple mosaic floor and plastered walls yet the evidence for fire-places in *a* (II) seems clear (*ibid.* pp. 340 f.).

One might also wonder why, if the pillar-partition room was really used as a light-well, it was not sometimes endowed with a pillar-partition on both sides so that it might light rooms on each side of it—as was occasionally done in Minoan Crete, for example in the Villa at Hagia Triada, and in the north residential quarter at Phaistos.¹⁴

The hypothesis of Mrs. S-H. that the Olynthian *kapnodoke* served a double purpose—to vent smoke and to admit light—is therefore, I believe, not warranted by the evidence at our disposal. The vent probably varied somewhat in size and form but it may be doubted whether it ever approached the point where it could be called a light-well, or that it was sometimes used as a light-well purely and simply.

J. WALTER GRAHAM

UNIVERSITY OF TORONTO
ROYAL ONTARIO MUSEUM

¹⁴ Rooms 3 and 4 and Room 50 respectively.