

With the compliments
of the editor.

News Letter from the Levant (Southern Section), 1982

DUANE W. ROLLER

(Pls. 36-39)

This News Letter reports on fieldwork which took place in late 1981 and 1982. It could not have been written without the generous cooperation of excavation directors in Israel and Jordan who shared unpublished material, and the draftsmen and photographers who supplied the illustrations and figures.

The sites reviewed here date to all periods from Paleolithic through Medieval (ill. 1). New projects were undertaken only at 'Ain Ghazal and Abila. Surveys were important, especially in the little known regions E of the Jordan River, where hundreds of new sites of all periods are discovered each year. The density of material continues to be astounding: in a mere 69 km.² along the S bank of the Wadi el-Hasa 522 sites were discovered—most never previously noted—one site for every 110 km.². Prehistoric material is the most common discovery in these surveys, and 'Ain Ghazal, near Amman, promises to become known as one of the major Neolithic sites in the Near East.

Of particular importance for Bronze Age archaeology is the discovery at Aphek of the finest MBA palatial architecture in Israel, as well as extensive EB IV material at Khirbet Iskander, and further work at the LBA maritime installations at Dor. The Iron Age was particularly well represented at Dor with the discovery of a four-room gatehouse similar to others in Israel, and in the excavations at Jerusalem of debris associated with the destruction of 586 B.C. Material from the Hellenistic and Roman periods included an unrobbed Roman tomb at Abila, probably of the 2nd or 3rd c. A.C., and a Hellenistic warehouse at Caesarea Maritima. Byzantine and later periods were represented by a large Christian basilica at Abila and a medieval tower excavated at Michmoret. Survey work continued in the Jawa area of NE Jordan, where 2100 inscriptions of recent times have been discovered.

Bibliographic research on this region is aided by the work of Eleanor K. Vogel and Brooks Holtzclaw, *Bibliography of Holy Land Sites*, Part 2, which originally appeared in the *Hebrew Union College Annual* 52 (1982), but is now available as a separate fascicle (Cincinnati 1982). It contains a thorough list of published reports on sites in Israel and Jordan from 1970 through 1981, and supplements Part 1 (*Hebrew*

Union College Annual 47 [1971]), which is also available separately (3rd printing, Cincinnati 1982); the latter contains material published before 1970.

SURVEY PROJECTS

Surveys concentrating on a single period are discussed in the appropriate sections below.

Abila. Professor W. Harold Mare reports that a regional survey, undertaken in connection with excavations at the site, covered an area of 25 km.² in a radius of 2.5 km. from the center of the ancient city. Although the ceramics confirmed previously known evidence for the long occupation of the region, most of the architectural material dated to the flourishing period of the city of Abila (Hellenistic through Byzantine times). Especially noteworthy is a water tunnel, 1 m. wide and up to 2 m. high, extending through a hill S of the city for several hundred meters; the date of construction is uncertain. In addition, a number of Roman painted tombs were found, supplementing an already large group previously discovered. The most impressive tomb contained representations of architecture, finely executed, and a frieze of camels and other Oriental animals (pl. 36, fig. 1). The date may be as early as the late 1st c. A.C.

Emeq Hefer. Dr. Samuel M. Paley reports the discovery of EB occupation at the base of Khirbet Yamma. Soundings at Tel Nurit confirmed the existence of material from the MBA through the Hellenistic period, as well as Byzantine, Medieval and later remains. The site itself, however, was unsuitable for excavation since the ceramic material is badly eroded and no architecture of any period was found.

Wadi el-Hasa (ill. 2). Dr. Burton MacDonald reports that the final season of this survey in northern Edom continued E to the beginning of the Hasa gorge at the Desert Highway. The total number of sites catalogued in the three seasons of survey was 1074, over an area of about 300 km.². Over half the 522 sites found in 1982 produced lithic materials of all periods from Lower Paleolithic through the Aceramic Neolithic. Most common was the Middle Paleolithic, with Levantine Mousterian or Levallois-Mousterian material occurring at nearly 200 sites. There

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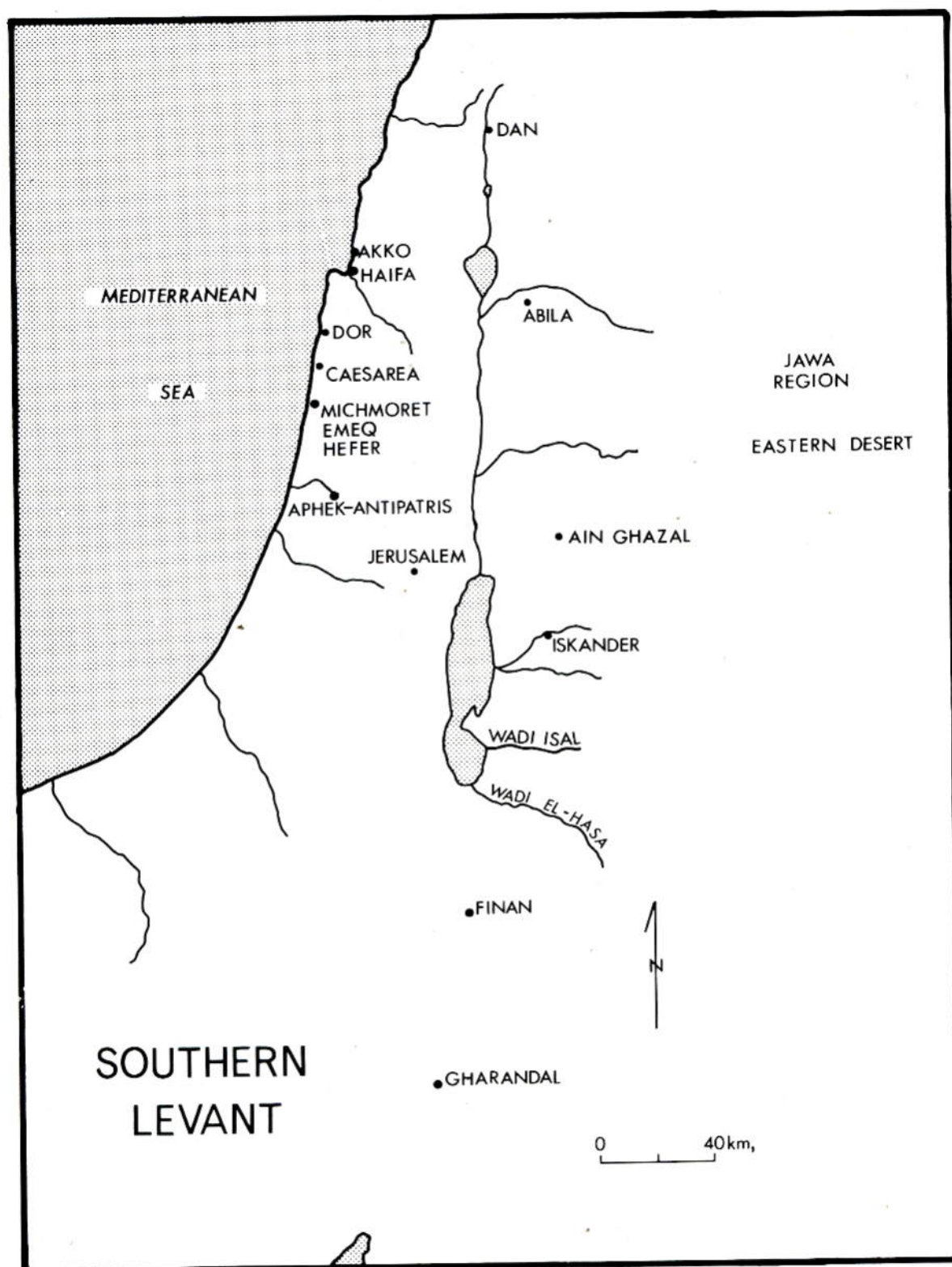
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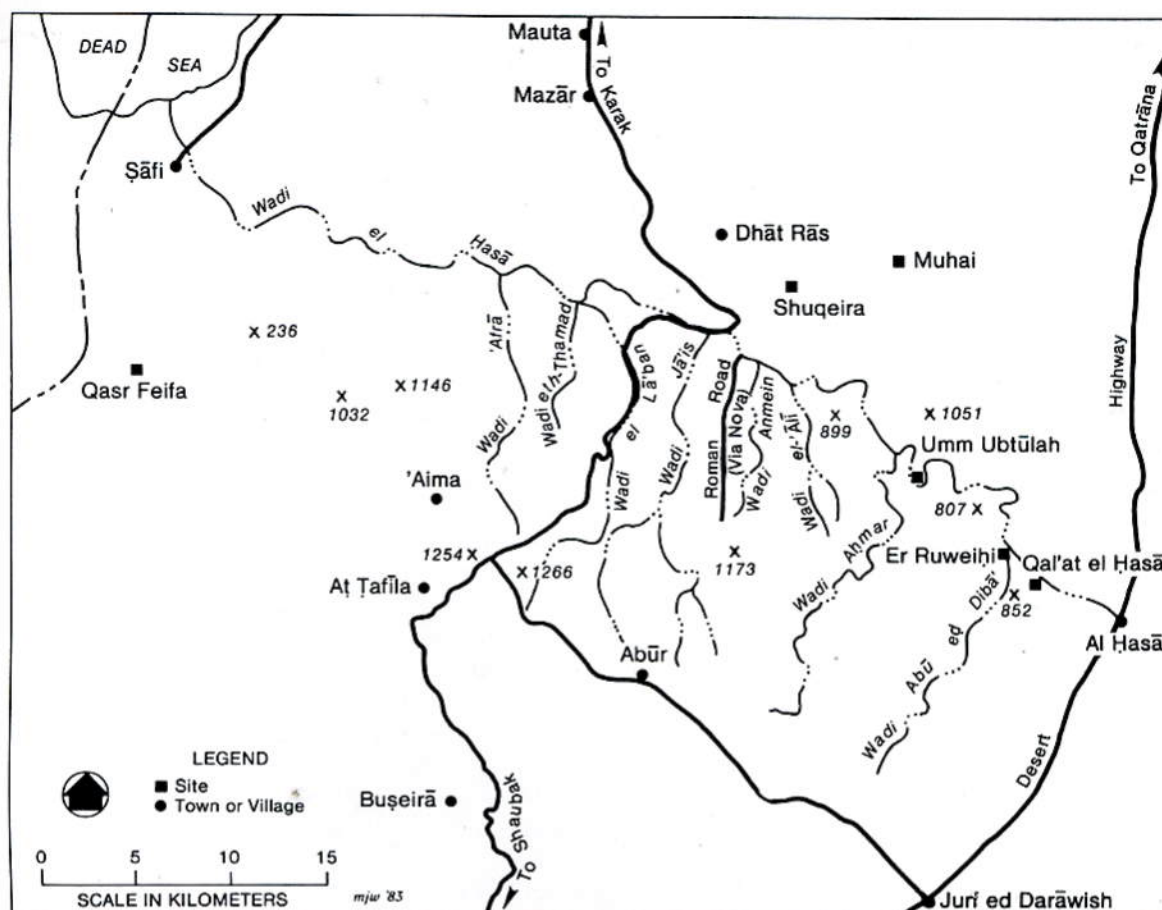
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III. 1. Sites mentioned in text



III. 2. Wadi el-Hasa. Area of survey

were also approximately 30 Lower Paleolithic sites (all but one Late Acheulean), and approximately 40 Upper Paleolithic sites. Clear Epipaleolithic material appeared in a collapsed rock shelter at the eastern end of the Hasa which contained great numbers of Geometric Kebaran artifacts, including rectangular and trapezoidal microliths. Two Natufian sites were also discovered.

Ceramics encompassed all periods from Late Neolithic through Islamic, except for the Middle and Late Bronze Ages: this gap confirms previous observations. Iron Age finds were, however, unexpectedly limited. Only one Iron I site was found, and all Iron II material came from W of the Wadi el-'Ali, indicating that the eastern limits of Iron Age habitation had been reached. The substantial representation of Hellenistic material may help clarify the Iron Age/Hellenistic transition in this area. Nabataean and later periods were all extensively documented, except for the Early Islamic period (before A.D. 1187). Roman finds included a major military camp, known locally as Umm

Ubtūlah, possibly a feature of the Limes Arabicus. An indication of the eastward progress of the survey was the discovery of the first Parthian sherds found in the region, dating from the later Parthian period (2nd–4th cs. A.C.).

Wadi Isal. Dr. Linda Jacobs reports that a survey of this Moabite wadi identified 90 sites, predominantly of the Byzantine period. Seven structures, all associated with Early Byzantine pottery, were found: all were constructed of meter-wide walls of field stones two courses thick with rubble-filled interstices. One of these buildings was located along a road identified by Nelson Glueck (*The Other Side of the Jordan* [New Haven 1940] 14) as Roman, suggesting that the road was still in use in Byzantine times. The remainder of the Byzantine sites were ephemeral settlements by transient populations of nomads or farmers. In addition, 31 presumably Byzantine stone tombs were recorded: these were invariably circular, about 5–6 m. in diameter, and located in prominent high spots.

The remaining sites ranged in date from Middle

Paleolithic through Ottoman. Of particular note were three Levallois-Mousterian sites on a Pleistocene river terrace, a large Chalcolithic site with possible wall foundations and a cistern, and one Ayyubid-Mamluk mound. Roman pottery of the 1st c. A.C. was more common than Nabataean material, perhaps an indication that Nabataean control of the region was not as strong as previously thought.

PRE-BRONZE AGE SITES

'Ain Ghazal. Dr. Gary O. Rollefson reports that this Pre-pottery Neolithic B village in the NE suburbs of Amman is three times the size of contemporary Jericho. Over 50 structures, most rectangular and with several rooms, were found. Some are up to 7-8 m. long, although one was 15 m. long and possibly served some public function. The structures were in three distinct clusters with the largest building in the central group. A step trench (pl. 36, fig. 2) through this group disclosed at least four occupational phases; two more phases seem to lie immediately beyond the probe. In all phases of construction, undressed limestone slabs set in mud mortar were used for at least the lower portions of the walls; there is some evidence for the use of mudbrick. The floors were made of an extremely hard lime plaster with a highly burnished finish containing red ochre.

The structures contained benches (pl. 36, fig. 3) and sunken plaster hearths. In every case where the remains had not sustained damage from bulldozers, burial pits were found under the floor within 1.5 m. S of the hearths: in one structure were four superimposed hearths and four burials. A total of 15 sub-floor burials was found, all apparently primary.

The botanical remains include, in order of abundance, lentils, peas, barley, wheat, fig, and possibly chickpea. Goat is the most common animal bone, with sheep clearly of secondary importance. Gazelles and carnivores are also common.

Flint artifacts conform with usual PPNB types, although it is intriguing that 40% of the tools are burins, since less than 5% are burins at contemporary Beidha. Only 20 bone tools were found at 'Ain Ghazal, indicating heavy reliance on burins for woodworking. Other artifacts show association with the northern Levant, including 11 plaster vessels of a white ware not uncommon in Syria and Lebanon, but unknown in Jordan and Israel. In addition, one highly stylized human figurine in plaster and at least 13 clay animal figurines were discovered.

Imported materials were numerous, including an obsidian knife suggesting Anatolian contacts, rocks

with possible asphalt stains from the Dead Sea, cowrie shell and "helmet shell" fragments from the Red Sea, and cockle shells and sweet clams from the Mediterranean. Several flakes of an exotic green stone may have come from the Beidha/Wadi Feidan area.

Much of vol. 27 (1983) of the *Annual of the Department of Antiquities of Jordan* is devoted to 'Ain Ghazal.

Eastern Desert. Dr. Alison Betts reports that, during the continuation of work in this region, 144 new prehistoric sites were located and much information on natural resources was collected. The most important site contained circles of small, round huts, and probably dates to the early part of the Aceramic Neolithic period. The date is indicated by a fragment of a notched point found amid an assemblage of fine flakes and bladelets with ovoid platforms, some with distinct tips. The site is located in an area of low zigzag walls which link the basalt peaks of the region (pl. 36, fig. 4). These walls, a simple form of animal trap, date to the 7th millennium. A number of rock carvings depicting such traps were found (pl. 36, fig. 5). Another important discovery was the location of a source of greenish obsidian, unique in this region.

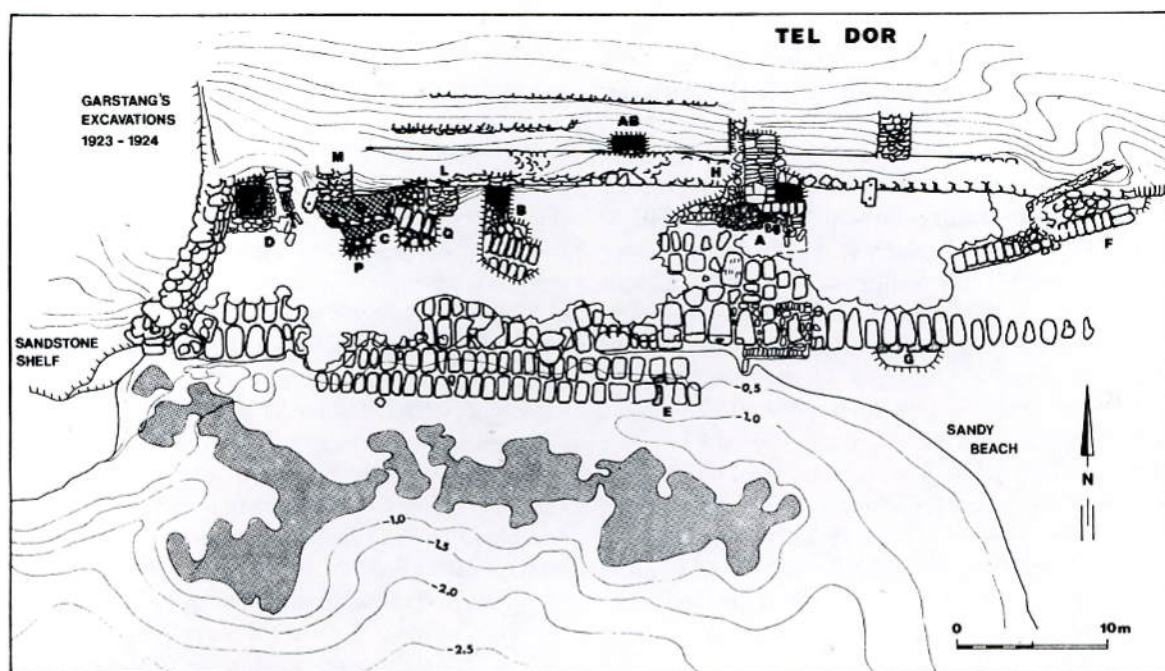
Jerusalem. Dr. Yigal Shiloh reports that excavation in the Kidron Valley near the Siloam channel revealed pure Chalcolithic deposits, the first discovered in the area.

BRONZE AGE SITES

Akko. For a brief report on the 1982 excavations at Tel Akko, which uncovered LB material possibly relating to the Sea Peoples, see *Center For Maritime Studies News* 8 (1982).

Aphek-Antipatris. Professor Moshe Kochavi reports that the tenth season of excavation revealed evidence for a palace of the initial phase of the MBA (20th c. B.C.). Its mudbrick walls were laid on stone foundations and coated with white plaster; they were preserved to a height of 1.50 m. and were 1.20 m. wide. This palace is evidence for reurbanization at the beginning of the 2nd millennium B.C., earlier than previously thought, and for the continuity of palatial construction at the site throughout the entire MBA and LBA.

A slightly later palace (18th/17th c. B.C.), first discovered in 1979, was found to be larger and more impressive than previously believed. One wing, covering about 1000 m.², has been exposed; it has walls of coursed large boulders and foundations 2 m. deep. Two pillar bases, each consisting of a large boulder 2 m. in diameter, were found inside the largest room.



Ill. 3. Dor. Maritime installations

The structure appears to be the most magnificent of the six known palaces at Aphek, and is the outstanding example of MBA palace architecture in Israel.

Dan. Dr. A. Biran reports the excavation of the northern portion of the MBA gateway uncovered in previous seasons (pl. 37, fig. 6). It was built of sun-baked mudbrick and consists of four chambers, two on each side of a three-arched passageway. All the arches were built of three courses of mudbrick covered with white plaster, which is still visible between the joins. The central arch is an integral part of the central pier of the gate; this pier divided the gate into four chambers. The chambers and passageway are assumed to have been roofed. The floor of the gate consists of a thick layer of white plaster set on top of a stone construction. From the gate a series of 20 steps leads down to a pebbled street within the city. A probe under the steps and the street revealed an earlier massive construction, perhaps remains of an EBA gate.

At some time the MBA gate was blocked and covered, perhaps because of a structural fault, since retaining walls were found on the N side of the E entrance, and on the S side of the W entrance, extending into the passageway of the gate itself. Moreover, the retaining walls were built diagonally so that, while reducing the original width of the gate, sufficient room was left for a comfortable passage. These walls could represent a desperate attempt to save the gate,

but apparently they were to no avail, and the gate had to be filled with earth brought from the surrounding wadis.

In the S part of the city, excavations reached the base of the stone core of the MBA ramparts. This core now stands to a height of 10.50 m. A small cist tomb discovered 3 m. to the N contained the skeleton of a 3-year-old child and a MB IIA juglet. Another stone-built tomb, dated to the end of the MBA, was discovered in the central part of the mound (pl. 37, fig. 7). It contained a number of burials, along with some 30 vessels, three scarabs, a bronze dagger, a silver toggle pin and two alabaster bowls.

Dor (ill. 3). Dr. Avner Raban reports that the 1982 season was devoted to the further exposure of LB II/early Iron Age ashlar-built maritime installations along the S rim of the tell. This work was done immediately E of the area of J. Garstang's excavations of 1923, which had cut through a series of occupational layers and revealed the W face of a sandstone wall of Iron Age date. A sound stratigraphic sequence was established in 1982.

The earliest structure is a Cyclopean wall of headers (ill. 3, E), originally laid into windblown sand. Incorporated in its upper course was a pavement of partially hewn sandstone slabs, which continues N slightly above mean sea level. Successive phases, from the LB II period into the early Iron Age, saw the rebuild-

ing of this area as the sea level rose. At the beginning of the Iron Age the pavement was used as a base for a portion of a long retaining wall (ill. 3, H) which ran along the S edge of the tell.

Just E of the wall discovered by Garstang, a rectangular well with an internal ashlar facing and a drainage channel built of large slabs was found (ill. 3, D; pl. 37, fig. 8). Although it is only 2–3 m. away from the seashore, the well contains fresh water with a low salinity. The ashlar facing of the well is surrounded by a rubble structure built in three different phases. During the third phase a large drainage channel, 0.80 m. across, was constructed about 2 m. to the E. It leads S toward the sea from within the tell, at a gentle gradient of 7%. To the E and W of the channel was a fill of crushed sandstone and red *humra* stone. In a successive phase, at a time when the well was not in use, a rubble wall was laid on this fill and over the NE corner of the well. Pottery, both on the sandstone-*humra* floor and in the fill around the drainage channel, is of the 2nd half of the 12th c. B.C. During the next phase two Cyclopean walls were constructed of Mt. Carmel limestone blocks, each weighing over one ton. The western wall was that exposed by Garstang; to the E, Wall M was cut through the *humra* floor. A white floor at the lower half of the second course had pottery dating to the 1st half of the 11th c. B.C. A somewhat higher floor at the W was covered by layers of soil and debris from the eroded slope of the tell; it dates mainly to the 10th c. B.C. Farther E an ashlar wall of headers (Q) was exposed.

The following succession of events can be reconstructed. In the LBA a quay, now below the water line, was built. At a later time, but still in the LBA, the ashlar wall of headers (Q) was constructed. This wall is covered by debris eroded from buildings on the shore, as well as wave-carried shells and eroded LBA sherds. It seems that the second stage of the well (D) and the raised pavement to the E (A) were built at this time. In the first half of the 12th c. B.C., the long retaining wall (H) and a *humra* floor were constructed. The third stage of the well and drainage channel (D) also belong to this phase. In the next phase the well was sealed; later the Cyclopean limestone walls (L, M and Garstang's wall) were built, sometime prior to 1000 B.C.

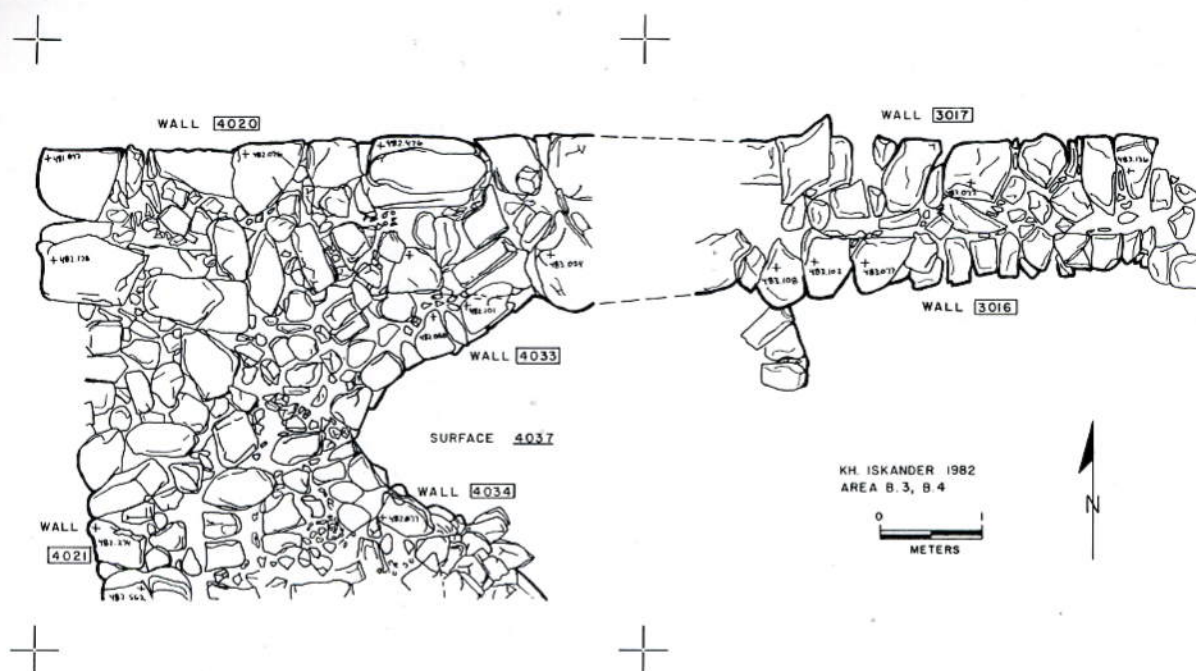
Haifa. The Center for Maritime Studies reports the discovery of material underwater S of Haifa, including a large copper "oxhide" ingot weighing 16.5 kg. and 5 irregular tin ingots weighing 4 kg. each, bearing signs in probably Cypro-Minoan script. No associated shipwreck has as yet been found, and the

material may have been thrown overboard to lighten the load.

Emeq Hefer. Paley reports that the fourth season concentrated on uncovering a three-phase MB IIA settlement on the W slope of Tel Hefer, where a large public building was discovered in 1979, and on the E slope where private houses were found in 1981. On the W slope, several courtyards and rooms of a plastered brick building, which covers an excavated area of 300 m.², have been traced, but the entire plan has not been revealed. On the N side of this building, and at a lower level, is an area paved with crushed local sandstone; from it a stairway leads up to a S entrance-way and an inner courtyard. On the E slope the earliest phase consisted mainly of levelled occupational surfaces on which were found bins and ovens; the second phase had the earliest architecture, consisting of scattered wall remains; in the third phase, domestic architecture covered the entire excavated area (pl. 37, fig. 9). The stone-built walls were preserved up to 0.80 m. in height. Each house consisted of one room and a courtyard containing ovens and domestic pottery, mostly storage vessels and straight-sided cooking pots. Most vessels were handmade, but wheelmade cooking pots were also found. Many domestic implements, including grinding stones, mortars, pestles and sickle blades, appeared in all phases. Comparison of the two slopes of the tell suggests that the E side, with no sea breeze, was a quarter of small, closely built, domestic units, perhaps for the common people, while the W side, exposed to the sea breeze, was the official residence or public quarter of the town.

Khirbet Iskander. Dr. Suzanne Richard reports that the second season of excavation continued to uncover the extensive EB IV remains. At the NW corner of the mound is a portion of a N perimeter wall at least 1.60 m. wide and seven courses high, with a buttressed corner or tower room (greatest width 4 m.; ill. 4; pl. 37, fig. 10). At an undetermined time the perimeter wall was buttressed with a 1-m. wide wall. There was also a mudbrick wall which presumably antedates the stone perimeter wall; associated pottery was clearly of the EB IV period. Whether the fortifications were built in the EB III or IV period has yet to be determined, but they could be the first example of EB IV fortifications in the region, and thus afford an important comparison for the EB III walls at Bab edh-Dhra (AJA 87 [1983] 185).

At the SW corner of the mound, the major E–W wall uncovered in 1981 was traced to the E, N and W. Its nature and date have not yet been determined, but it may be a fortification or terrace wall. It is evident



Ill. 4. Khirbet Iskander. NW corner of perimeter wall

that the entire area was used for domestic purposes in the EB IV period. South of the main wall, house walls were encountered below heavy wall tumble; N of the main wall there appears to be an open courtyard. EB III levels are not within close reach, since a probe 3 m. deep continued to yield EB IV pottery.

At the NW corner of the mound, immediately within the N perimeter wall, was an area of extensive domestic usage. The major N-S wall discovered in 1981 proved to belong to a well built typical EBA broad-room house, 4 m. by at least 7 m., with an oven against the W wall, apparently inside the house. Another typical broad-room house was discovered just to the W. A series of small rooms or bins was built up against the W wall of the first house. The size of the partitions in these rooms and their tiny entrances suggest that they were used as pens for small animals.

Jerusalem. Shiloh reports that on the W slope of the Kidron Valley, above the line of Hezekiah's tunnel, the earliest known phase of the city wall, dating to the MB II period, ca. 1800 B.C., was uncovered. Beneath this wall were domestic structures of the EB I/II period. In addition, to the N, a massive LB II podium was uncovered and exposed to a height of 17 m.; it was part of the LBA terrace system.

IRON AGE SITES

Abila. Mare and I report the discovery of an Iron Age burial on the summit of Tell Abila, beneath a Late Hellenistic or Roman retaining wall on the N side of the tell. A storage jar of the 7th or 6th c. B.C., which may be earlier than the burial itself, contained an adult female and an adolescent or child. Whether this tomb is part of a large cemetery has not yet been determined. Some 3 m. to the E were remnants of a mudbrick oven associated with mixed Iron Age and Hellenistic pottery, indicating a date contemporary with or slightly later than the burial.

Dan. Biran reports that the High Place of the 9th c. B.C. was built with walls of basalt stones forming rectangular chambers filled with earth, and covered with layers of flagstones. In addition, remains of the last Israelite settlement, dating to the early 6th c. B.C., were found in the central part of the mound near the MBA tomb (cf. supra).

Dor. For a summary of the maritime installations, some of which date to the earliest part of the Iron Age, see supra.

Drs. E. Stern and I. Sharon report that the third season of excavations on Tel Dor proper continued to enlarge the excavated Iron Age area. A trial trench

on the slope of the tell N of the area cleared in 1981 confirmed the sequence of fortifications; the mud-brick wall encountered previously was found to be more than 2.5 m. thick, and hence is probably a city wall. In addition, the massive remains of an Iron Age gatehouse of Mt. Carmel limestone in Cyclopean construction were found underneath the Persian-period and Hellenistic gates. The gatehouse projected 14–15 m. inward from the town wall; its width was probably 15 m. or more; its walls were at least 2 m. thick. These dimensions seem too small for a six-room gatehouse (as at Hazor or Gezer), but they match those of an average four-room gatehouse (as at Megiddo or Ashdod).

Two Iron Age phases have been identified in the area adjoining these fortifications, but no structure has yet been found complete enough to allow architectural interpretation. The general impression is that this E part of the tell contained large buildings and wide open spaces and was a public, rather than residential quarter. One striking small find of this period is an Assyrian cylinder seal (pl. 38, fig. 11).

From the period of Persian control is the threshold of a gateway complete with gate socket, offset slightly to the S under the S gate tower of the Hellenistic town wall. The orthogonal town planning of Dor probably dates from this period, for in two places the Hellenistic street lies directly over one of the Persian period, and the outer walls of the residential insulae adjoining it also date to the end of the Iron Age. If this dating is correct, then orthogonal town planning in Phoenicia may be as old as in the Aegean.

A shallow pit, dug outside the town wall and subsequently disturbed by the laying of a Roman pipe, contained fragments of at least five figurines, predominantly in western style, and a concentration of Attic red-figure sherds.

Jerusalem. In continued excavations through Iron Age levels, Shiloh found a stratigraphic sequence of the 12th through 10th cs. B.C., the first evidence for the Jebusite period of Jerusalem. A rectangular house of the 7th c. B.C. was also excavated at the bottom of the slope, E of the Siloam channel. To the N, above the Gihon Spring, a collapsed building contained a thick layer of burned debris with many small finds, including pottery vessels, arrowheads, iron axeheads, stone weights and ivory fittings for wooden furniture. Especially noteworthy were small pieces of charred wood from the furniture itself, carved in relief with palmette designs. Immediately to the S, within a 1 m. wide strip and on the top of a hardpacked mud-plaster floor, a group of ceramic vessels was discovered, as

well as four small limestone altars, bronze and iron arrowheads, and 51 clay bullae, including one with the name of Gemaryahu son of Shaphan, who was secretary to king Johoiakim (Jer. 36: 9–12; pl. 38, fig. 12). All this material is associated with the destruction of 586 B.C.; the structure may have been the royal chancellery.

The Iron Age water system known as "Warren's Shaft" was completely cleared and is expected to be open to the public in the near future.

Tel Michmoret. Dr. R.R. Stieglitz reports that, in the third season of this salvage project, a plastered springhouse of the late Iron Age, consisting of two rock-cut channels leading to a circular collecting basin, was cleared. Adjacent to it sherds of the Late Persian and Hellenistic periods were found. The installation was apparently still in use in the 19th c.; an Ottoman gold coin dated 1839 was discovered in a contemporary pot in the eastern channel.

On a bluff S of the present harbor is a building of the Persian period; built of large, dressed sandstone blocks, it has preserved walls 2 m. high and over 1 m. thick. The finds from the fill within the building included sherds of the 5th–4th cs. B.C., with imported Attic wares, the head of a clay Astarte figurine, and two varieties of purple shells (*murex trunculus* and *brandaris*).

HELLENISTIC AND ROMAN SITES

Abila. Mare reports the excavation of several multi-roomed rock-cut chamber tombs of Roman date. A single unrobbed tomb consisted of a square vestibule with six loculi and remains of approximately 8–10 individuals. Grave goods included several fine terracotta figurines, among which were a female harpist, a horse and rider, an Apollo and a Dionysos (pl. 38, fig. 13). A number of whole vessels were also discovered, as well as two gold rings, one having a carnelian signet with an incised wolf. The assemblage dates to the late 2nd or early 3rd c. A.C., although the tomb may have been cut as early as the 1st c. A.C., since a nearly new lamp of that period was found in one of the lamp niches.

I report that a probe on Tell Abila revealed an E–W retaining wall of Late Hellenistic or Roman date. A number of secondary cross walls indicated that domestic structures abutted this wall; thus the domestic use of this area suggested by the late Iron Age oven (cf. *supra*) continued into the Hellenistic period and perhaps into Roman times. Tell Abila may thus not have been the civic center of the city, and the agora and forum should be sought elsewhere, probably on

Tell Umm el-Amad just to the S, where a number of foundations indicate the existence of large buildings. An alternative location is the saddle between the two tells where there is a large Roman nymphaeum.

No precise dates for any of these remains are available, although historical considerations suggest that the Hellenistic material dates after the beginning of Seleukid control early in the 2nd c. B.C., and that Pompey's creation of the Dekapolis in the following century brought about another period of expansion for the city.

Aphek-Antipatris. Kochavi reports that a probe revealed three occupational layers of the 3rd through 1st cs. B.C., associated with Hellenistic Pegai, thus closing the gap between Israelite Aphek and Roman Antipatris. In addition, a small theater or odeion of the Roman period was found near the S end of the *cardo maximus*; the stage building rested on 10 arches, five of which were found intact. The building was never completed, and was destroyed in the earthquake of A.D. 361.

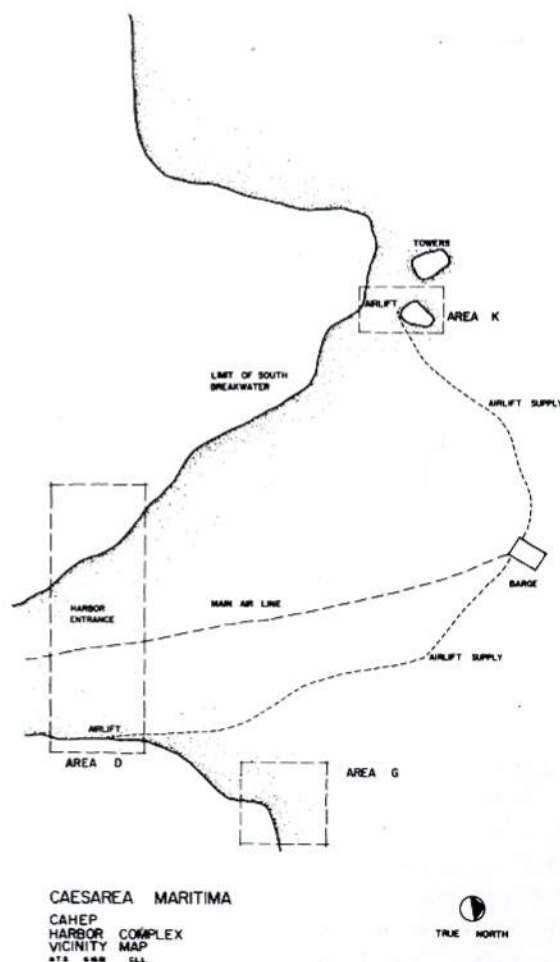
Caesarea Maritima. Dr. R.L. Hohlfelder reports that underwater excavations were conducted at four locations in or near the entrance to the outer basin of Herod's harbor (ill. 5). A N-S trench placed on the present ocean floor in the harbor near the Northern Breakwater produced an impressive quantity of diverse artifacts from the 1st c. B.C. to the 7th c. A.C., with a concentration of material from the 1st c. A.C., including volute lamps from Italy, a Herodian lamp, Arretine ware, bowls, jugs and cups, several whole amphoras, a bronze aryballos, a wooden sheave-block, pieces of rope and worked wood, and miscellaneous metal objects such as decorated net weights, bronze nails and lead sheeting (pl. 38, fig. 14).

Two other underwater probes at or near the NW corner of the Northern Breakwater were intended to provide information on the construction techniques employed and to locate the site of the eastern entrance tower (Josephus, *JW* 1.4.3 and *JA* 15.338). The first trench traced the visible edge of a large concrete block, ca. 15 × 11.50 m., located at the NW corner of the breakwater, and typical of those in this section of the breakwater (pl. 38, fig. 15). Significant remains of the wooden construction frames used in the creation of the breakwater were uncovered in a remarkable state of preservation. The forms consisted of base beams, ca. 0.30 m.², which rested directly on the sea floor and interlocked at the corners with simple lap joints. At regular intervals of ca. 1.40–1.60 m., vertical wooden supports had been affixed to provide an internal frame to which horizontal planks were secured; the

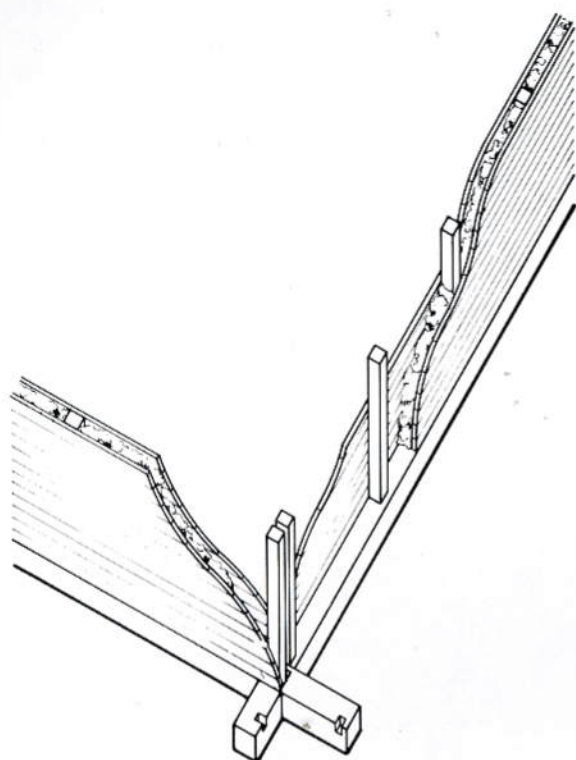
whole formed a double-walled caisson (ill. 6). The space between the inner and outer faces had been filled with mortar, forming a structure similar to one described by Vitruvius (5.12.5). Noteworthy among the artifacts uncovered in this trench were a small (0.08 m. high) bronze statuette of Zeus or Serapis holding an eagle on his right hand, probably from Alexandria and dating to the 2nd c. A.C., as well as an arm of Tyche holding a cornucopia.

A second trench, seaward of the one described above, revealed another and similar concrete block, but not in any way connected to the breakwater or from any structure on it. It seems to have been the foundation platform for the E entrance tower.

One limited land probe at the site of a submerged Hellenistic quay adjacent to the synagogue of Caesarea, ca. 300 m. N of the Northern Breakwater, pro-



Ill. 5. Caesarea Maritima. Map of harbor complex



CAESAREA MARITIMA

C.A.H.E.P. AREA G
CAISSON RECONSTRUCTION JS

Ill. 6. Caesarea Maritima. Reconstruction of caissons

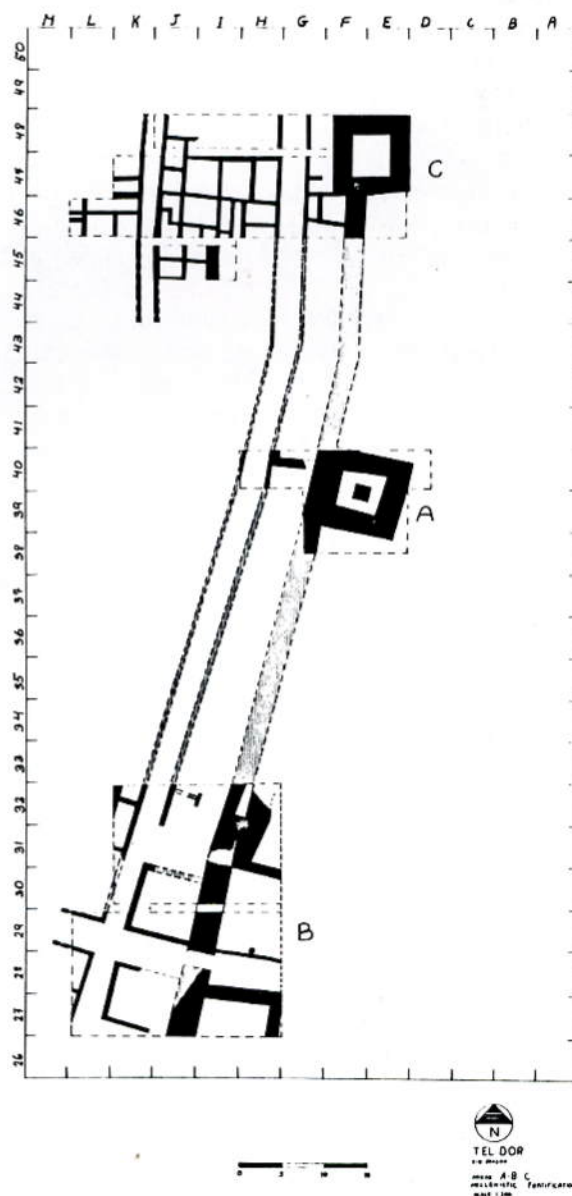
duced the largest concentration of Hellenistic pottery and artifacts yet discovered at Caesarea. Enormous quantities of cooking pots, fish curing vessels, Megarian ware, Rhodian and other amphoras, amphoriskoi, unguentaria and glazed fish plates have been uncovered, possibly from a warehouse or merely a dump. Most of the material dates to before 100 B.C.; the early date and the nearby Hellenistic quay suggest that this was one of the Hellenistic settlements which had been abandoned before the building of Caesarea, perhaps even a district of the elusive Straton's Tower.

Dor (ill. 7). As Stern reports, further evidence shows that the city may have remained unfortified between the time when the late Iron Age fortification went out of use (early 4th c. B.C.) and the construction of the Hellenistic wall in the 3rd c. B.C.; during this period Phoenician influence remained strong. In addition, the width of a Hellenistic insula was established at 15 m. by the finding of a second Hellenistic street W of the one revealed in 1980–1981. This sec-

ond street had been repeatedly repaved and continued in use into the Late Roman period.

BYZANTINE, ISLAMIC AND LATER SITES

Abila. Mare and I report the discovery of the apse of a large Christian church on the summit of Tell Abila. The apse, destroyed by a major earthquake, was constructed of well cut and carefully laid basalt blocks on the exterior and limestone headers on the interior, with a rubble core between. The diameter of



Ill. 7. Dor. Hellenistic fortification

the apse is estimated at 7.50 m.; there may have been a secondary apse to the N. The church was probably constructed during the 5th or 6th c. A.C. and destroyed in part at the beginning of Islamic control, since Ummayyid pottery was associated with the reuse of some blocks of the apse. Occupation of the area was terminated by the mid-8th c. A.C., perhaps by the great earthquake of A.D. 746, since the entire area contained a meter-deep fill of ashlar blocks fallen into such a thick jumble that the metal clamps had never been removed; yet there was no significant amount of post-Ummayyid pottery in the fill.

Corpus of the Inscriptions of Jordan Project. Dr. Michael MacDonald reports that in the Jawa area (pl. 39, fig. 16), somewhat to the SE of the 1981 survey region, some 890 items were recorded, bringing the total to 2100 inscriptions, drawings and tribal marks in an area of ca. 2.5 km.². Among the 314 Safaitic inscriptions discovered, a number contained unusual words and phrases, as well as some previously unattested plurals of words so far known only in the singular or dual. There were also a significant number of new names and several groups of inscriptions by successive generations of the same families.

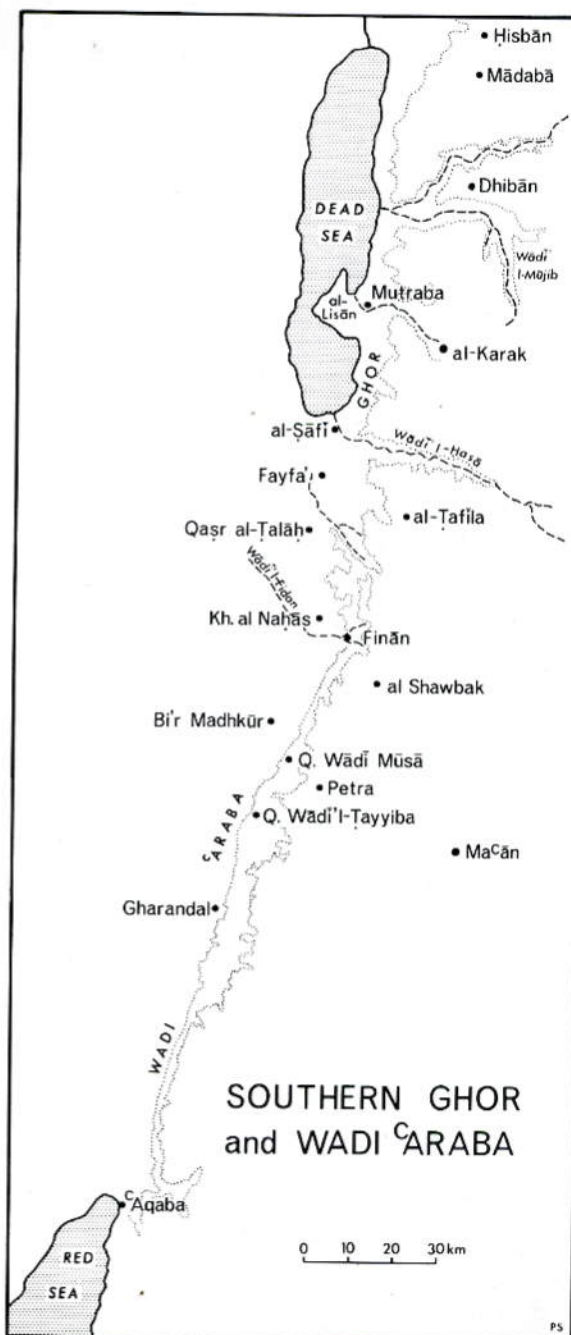
In addition, 209 Arabic inscriptions, all religious, were found, as compared to 65 in 1981. Many were modern and most of the authors could be identified locally. These inscriptions added considerably to knowledge of local names and genealogies, as well as of carving techniques. Amidst a considerable number of Kufic graffiti in approximately one km.² were up to eight texts by a single author, a pattern seen in both the Safaitic and modern texts. It is tempting to see the Kufic writers as residents of the area rather than travellers through it; in addition, perhaps literacy among the Bedouin is more widespread than has been thought, and indeed it may never have completely died out.

Jerusalem. Canon John Wilkinson reports that the British School of Archaeology is continuing its studies of medieval Jerusalem. Nearing completion is a survey of the monuments of the Mamluk period (14th–15th cs.). These elegant and generally excellently preserved buildings were used as Islamic theological schools, palaces and hospices; examination of the monuments and of the accompanying manuscripts and inscriptions is providing not only material for understanding Islamic urban life in the late Middle Ages, but a unique opportunity to learn about life in an Islamic Holy City.

Work also continued on the completion of a corpus of Crusader churches. In 1982, the last surveying was

completed. This study not only provides information on how the Crusader newcomers were affected by the Levantine architectural environment, but has greatly advanced knowledge of the pottery of the period and of the Crusader settlement itself.

A third project, also nearly completed, is a study of



III. 8. Survey of Byzantine and Islamic Sites in Jordan.
Map of survey area

Early Christian churches in the Levant. Jerusalem is significant in this inquiry, since there are many floor mosaics preserved in churches, which may be closely paralleled in synagogues.

Tel Michmoret. Stieglitz reports that on the highest point of the bluff S of the harbor are the well preserved remains of a tower 8 m.², built of dressed sandstone blocks, some taken from earlier structures on the site (pl. 39, fig. 17). On the basis of the dimensions of the foundations, it is possible to suggest an original height of at least 5 m. Inside the tower an original earth fill 2 m. deep was preserved; the sherds in this fill were mostly Byzantine. A living surface of the 10th or 11th c. A.C. abutted the outside of the tower; on it were glazed sherds, and an Islamic gold coin of the 11th c. The Michmoret tower may be one of those mentioned by the geographer Muqaddasi (ca. 10th c. A.C.) where Moslem captives were redeemed from Byzantine ships.

Survey of Byzantine and Islamic Sites in Jordan (ill. 8). Dr. Geoffrey King reports that the third season of this project examined the E and S shores of the Dead Sea and the Wadi 'Araba as far S as Gharandal. The flourishing Byzantine presence in the area has long been assumed on the basis of literary sources and the Madaba map. Indications of a substantial Byzantine occupation were noted E and S of the Dead Sea,

from near Mutraba to Fayfa' and into the Wadi 'Araba. On al-Lisān one of two monasteries was examined, known locally as Dayr al-Qattar al-Byzanti.

The survey discovered that the southern Ghor did not contain the normal assemblage of Islamic ceramics known from northern Jordan, the only exception being Mutraba where familiar Ummayyid wares were found. Yet there was plentiful evidence that the rich agricultural potential of the entire area was exploited in Mamluk times; major occupations of this period were recorded in several areas, including al-Sāfi and Fayfa'.

To the S, in the Wadi 'Araba, the most extensive site is Finān (ancient Phaino), a Byzantine settlement with a citadel, churches, graveyards and a complex irrigation system. West of Finān is evidence of extensive settlement and agricultural development; another site in the same area seemed to be principally Nabataean. The attraction of the Finān region is the copper mine exploited since antiquity; Nabataean and Roman remains were found throughout, as well as Byzantine material. Islamic material, however, appeared only occasionally.

DEPARTMENT OF CLASSICS
WILFRID LAURIER UNIVERSITY
WATERLOO, ONTARIO N2L 3C5 CANADA

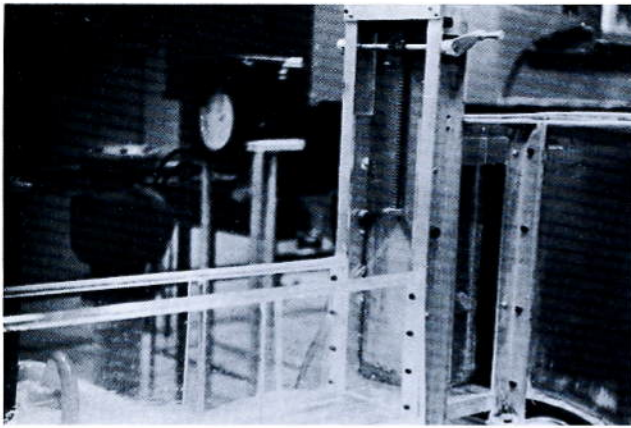


FIG. 6. Sluiceway lowered further, water level in reservoir high, causing high head



FIG. 8. Close-up of inspection window in reservoir, showing high water level and graduated measuring scale

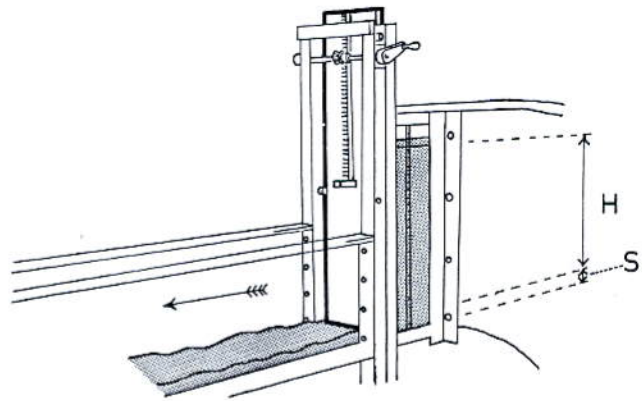
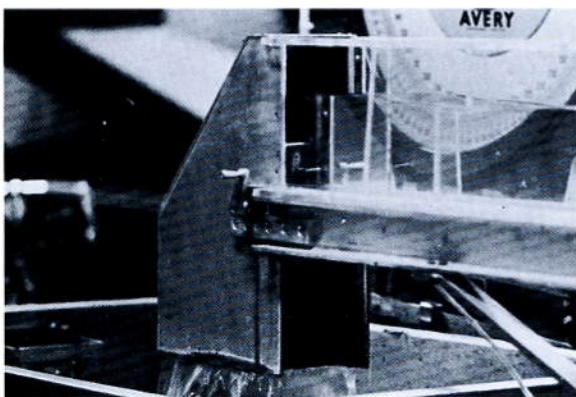


FIG. 7. Simplified drawing, illustrating fig. 6. Compare ill. 4. Note: in figs. 4-5 and figs. 6-7 the same volume of water (discharge) is running through the apparatus; only the position of the sluiceway has been changed



FIG. 9. Nîmes, *Castellum Divisorium*; at back, entry channel from aqueduct

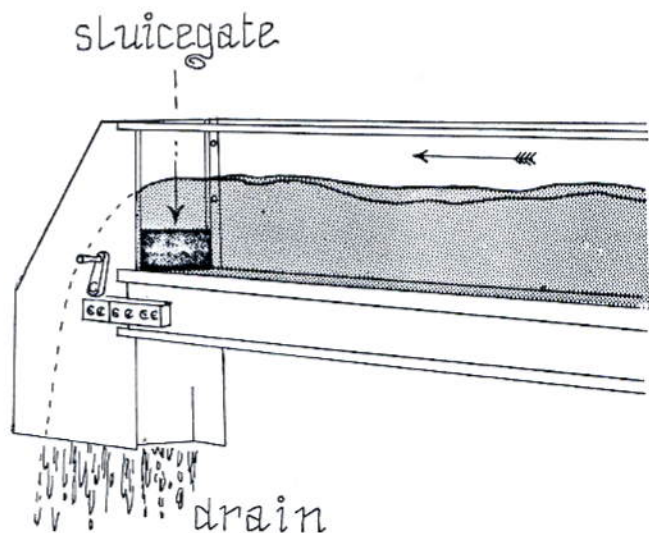


FIG. 11. Simplified drawing, illustrating fig. 10. (Corrected for refraction)

FIG. 10. Downstream end of test channel, showing sluiceway raised from bottom of channel (or variable weir) to regulate outflow of water. Note: in this photograph, view of sluiceway is heavily distorted by refraction



FIG. 1. Abila. Painting in Roman tomb. (Russ Adams)



FIG. 2. 'Ain Ghazal. Step Trench from E. (G. Rollefson)



FIG. 3. 'Ain Ghazal. Apsidal bench in W room of house. (G. Rollefson)



FIG. 4. Eastern Desert Survey. Prehistoric animal traps



FIG. 5. Eastern Desert Survey. Rock engravings depicting animal traps



FIG. 6. Dan. Mudbrick gate with steps. (Nelson Glueck School of Biblical Archaeology)



FIG. 7. Dan. MBA Tomb. (Nelson Glueck School of Biblical Archaeology)



FIG. 9. Tel Hefer. MB IIA domestic architecture



FIG. 8. Dor. Rectangular well and drainage channel. (A. Raban)



FIG. 10. Khirbet Iskander. Gateway in fortification wall. (Kevin Kline)



FIG. 11. Dor. Assyrian cylinder seal. (Z. Radovan)



FIG. 12. Jerusalem. Pottery, altars and bullae from 6th c. B.C. destruction debris. (Z. Radovan)



FIG. 13. Abila. Terracotta figurine. (R. Adams)



FIG. 14. Caesarea Maritima. Miscellaneous pottery from sea floor. (H. Wadsworth)



FIG. 15. Caesarea Maritima. Concrete block with beams of wooden caisson. (H. Wadsworth)



FIG. 16. Jawa area. (Corpus of the Inscriptions of Jordan)



FIG. 17. Tel Michmoret.
Area of survey



FIG. 2. Phaistos, Upper Court I, reconstruction of kouloura. (Mario Chighine)



FIG. 1. Phaistos, Upper Court I, arc-shaped section of wall found at the foot of the Grand Staircase. (After *ASAtene* n.s. 27-28 [1965-1966] 344 fig. 36)