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THE ROMAN ROAD SYSTEM IN JUDAEA

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Ironically, some of the most neglected topics in archaeological studies of late Roman Palestine have been in those areas where Roman technology and innovativeness were at their best. The study of baths, aqueducts, sewerage systems, the use of vaults, domes and cement, all contributed to the uniqueness and high level of material culture under Rome. Of first rank in Roman ingenuity was its road system, which brought immediate political, economic, social as well as military benefits to the Empire at large. Traces of an extensive Roman road network exist in Israel, and I. Roll has undertaken to provide an updated summary of the many findings in this area.

During the period of Roman rule, the material culture of Palestine progressed in technology and expanded in scope. An impressive indication of the high level of culture is provided by the Roman road network throughout the province of Judaea (later known as Palaestina). About 1,000 Roman miles (1,500 km.) of major roads were built, extending northward from Berosaba (Beersheba). This road system required construction of bridges and supporting terraces, land leveling operations, as well as many ancillary features that make orderly transportation possible: road stations and caravanserai, wells and reservoirs, guard stations and watchtowers, milestones, and other official structures. Thus, the road network may be considered to be the most important construction project of the imperial administration in Judaea.

During the last century, the field surveys conducted by Conder and Kitchener provided a comprehensive and detailed picture of the Roman network of roads in Palestine. The publications and maps of the British Survey serve as a good basis for present research on the subject, especially since many of the features that were then observed no longer exist. As interest in the subject grew, the French scholars Clermont-Ganneau, Germer-Durand, Sejourné, and later Vincent and Abel, concentrated on reading, copying, and subsequently publishing the inscriptions carved on milestones; this laid the foundations for the epigraphical research and the chronological study of the Roman roads of Israel.

The work was carried on further by the German scholars Schumacher, Dalman, Kuhl, Alt, and especially Thomsen who assembled, in a monumental article published in 1917, all the existing information on the milestones and the roads along which they were placed. From the 1930s on, the leading figure in this field has been Avi-Yonah; he has published many milestone inscriptions, and summarized the subject in his writings as well as in his maps. At the same time, studies of entire roads began to appear — the Legio-Sepphoris road by Hecker, and the Jerusalem-Jericho road by Beauvery and Wilkinson. The studies of Aharoni, Rothenberg, Harel, and Meshel have contributed to the understanding of the Roman road network in the Negev.

In 1970 the Israel Milestone Committee (IMC) was formed, as a branch of the International Curatorium of the *Corpus Miliariorum.*[1] The aim of the Committee is to assemble, study and prepare for publication in the seventeenth volume of the *Corpus Inscriptionum Latinarum (CIL)* the milestone inscriptions found in the country. The IMC also intends to carry out a systematic survey of all the extant remains related to roads, in order to provide a comprehensive picture of the Roman road network in Israel.

Roman motivations to invest great efforts in building roads were primarily military and administrative. Like most empires, its major concern was the proper administration of the province during periods of calm, and the efficient organization and transport of military units to key areas during times of war and rebellion. Other motivations were considered secondary. Thus, the growth of the population and economy in Roman Palestine was largely the *result* of the road network, and not the *reason* for its construction.

Before discussing this subject, however, let us review the basic factors that influence the creation of roads in general, and those factors which contributed to the construction of roads in Judaea in particular.

1. *Natural Geographic Factors*—terrain, type of soil and rock, water sources, climate, and vegetation. Each of these factors greatly influenced the creation of the road network in Judaea and dictated several north-south routes: along the coast, at the foothills bordering the coastal plain, on the mountain ridges, and along the Jordan River. This network also included east-west routes along the valleys or ridges which cross the terrain in this general direction.

2. *Human Geographic Factors*—distribution and density of the population, especially of the urban settlements. The main roads in Judaea have always led to the major urban centers, which were usually located at central road junctions.

3. *The Economic Factor*—usually playing a major role in the development of roads, it was of marginal importance during the Roman period. Naturally, the economic significance of the roads increased after their construction.

4. *Geo-Political Factors*—dictated the purpose of the road network, the choice of its major routes, as well as the resources invested in roadlaying and maintenance. During Herod's reign, for example, when Judaea was a relatively small political entity centering on Jerusalem, the factors commanding the policy of road construction were quite different than when it was a distant province on the eastern border of a great empire whose center was in Rome.

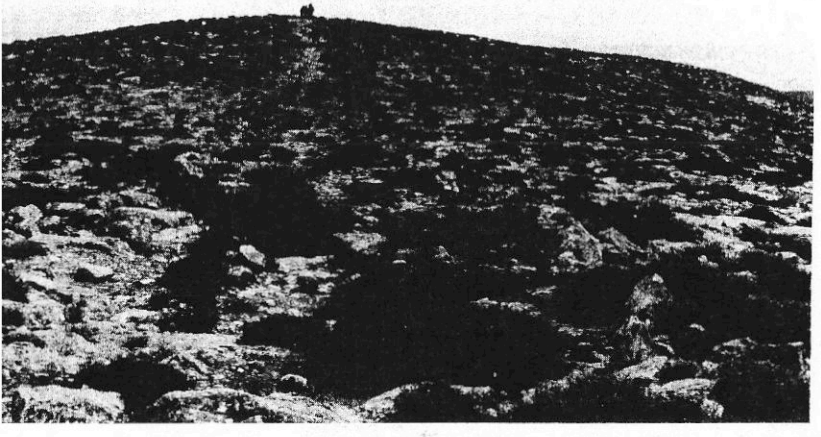
5. *The Geographical Location of Judaea*—in the heart of the Middle East between Syria-Mesopotamia and Egypt, and between northern Arabia and the Mediterranean. Because of this strategic location, many of the roads in ancient Palestine have traditionally become internationally important routes.

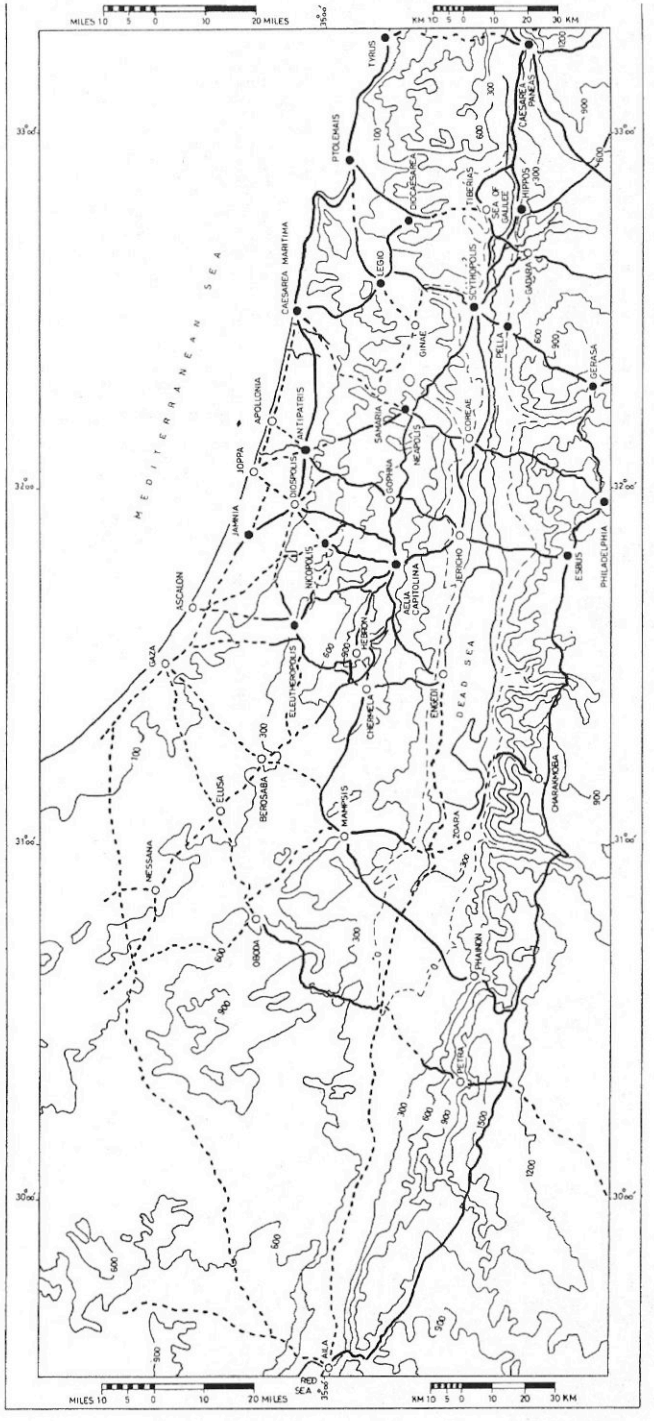
6. *Means of Traffic and Level of Technology*—two factors that jointly dictate the design of the road, its method of construction and its dimensions.

Historical Development

The Roman road network in Judaea was not constructed at once, but evolved gradually from the First Revolt onward. Until then the Roman administration used roads that had been built during or prior to the reign of Herod. Our knowledge of those roads is scanty, and is based essentially on isolated written sources—mainly in the New Testament and Josephus. These sources do not mention anything relating to road construction or maintenance before the beginning of the rebellion in 66 C.E. We may conclude, therefore, that the subject was not of central concern to the Roman procurators. On the other hand, talmudic sources indicate that in the period before the rebellion, the

Ma'aleh Dragot, south of Chermela; segment running along watershed.





Map of the Roman road system in Israel (drawn by A.M. Nijes).

institutions of Jewish leadership invested great efforts in the repair of the roads to Jerusalem, in an attempt to ease travel for pilgrims on their way to the capital on the three Festivals.

> On the fifteenth thereof (of Adar) appointees of the court go forth and repair the roads and the streets which have been damaged by rains, just before the Festival (of Passover), in order to help the pilgrims, and thereby they (the roads) will be in good repair for all three Festivals (T *Shekalim* 1:1, ed. Lieberman, p. 200).

With the outbreak of the First Revolt the situation changed dramatically. The emperor Nero charged Vespasian to suppress the uprising. From Josephus (*War* 3, 4, 2 (65-69)) we learn that, in response, a great army comprised of three legions, twenty-three infantry battalions (*cohortes*), six cavalry units *(alae)*, and additional support troops sent by Agrippa II and the kings of Commagene, Emesa, and the Nabataeans—a total of sixty thousand men—was concentrated in Ptolemais.[2] This army, which included heavy war machines as well as supply convoys, proceeded eastward, and after hard battles at Jotapata and Gamla, gained control of the Galilee and the Golan.

Later on the Roman legions proceeded south and east from their winter bases in Caesarea and Scythopolis (*War* 3, 9, 1 (412); 4, 2, 1 (87-88)) and, after conquering the Jewish areas in Transjordan and most of Judaea, except for Jerusalem and its environs, established themselves in Emmaus, Jericho and Gophna (*War* 4, 8, 1 (449); 4, 9, 9 (551)). These three towns served as the major springboards toward Jerusalem (*War* 5, 1, 6 (42); 5, 2, 1 (50) and 3 (67-69)). In order to move large forces rapidly from one front to another, maintain efficient and uninterrupted communications between the central command and the field units, and ensure a steady flow of supplies, the Romans had to undertake a sizeable program of maintenance and improvement of existing roadways, as well as building new ones. An interesting description of the construction of a road during an advance of the Roman army is found in Josephus. He writes that during the march to Jotapata, Vespasian

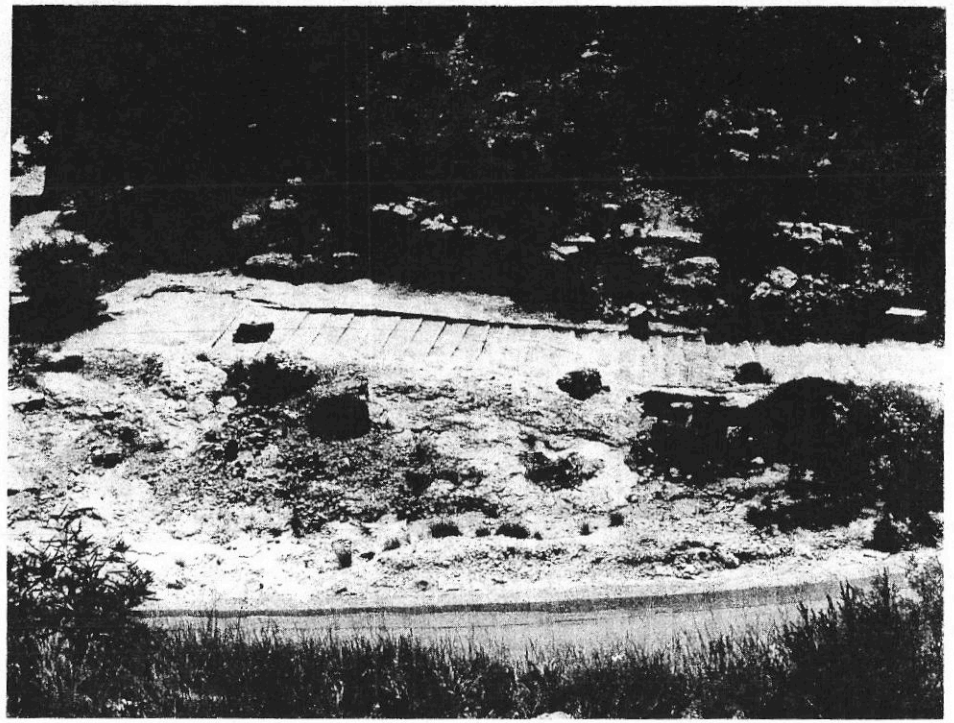
> sent a body of infantry and cavalry in advance to level the road leading to it, a stony mountain track, difficult for infantry and quite impracticable for mounted troops (*War* 3, 7, 3 (141)).

Elsewhere we read that the Roman army even included special units of

> pioneers, to straighten sinuosities on the route, to level the rough places and to cut down obstructing woods, in order to spare the army the fatigues of a toilsome march (*War* 3, 6. 2 (118)).

Recently a new source has come to light—a milestone from the year 69 C.E., discovered near Afula *(JRS* 66 (1976):15-19). It is the earliest milestone found in Israel and testifies to roadlaying work undertaken in that year by soldiers of the Tenth Legion on the Caesarea—Scythopolis road, under the care of its commander, Marcus Ulpius Traianus (Emperor Trajan's father).

After Titus suppressed the Jewish rebellion, the restructuring of the Roman



Rock-hewn steps on the Jerusalem—Eleutheropolis road; ascending from the Elah valley to the hill area.

administration began; Judaea became a praetorian province whose center was in Caesarea. The governor had at his command the Tenth Legion garrisoned in Jerusalem, as well as four infantry and two cavalry battalions—which we learn from a military document dated to 86 C.E. (*CIL* XVI, 33). Our knowledge of road construction in that period is sadly lacking, but we may assume that the Roman government was concerned with maintaining the main roads between the important centers of government along the coast and in the hinterlands, i.e. the roads between Caesarea and Jerusalem, between Jaffa and Neapolis (both cities were granted Roman municipal status under Vespasian), and the coastal road.

Under the rule of Trajan (98-117 C.E.), far-reaching changes in Rome's eastern policy and along the Empire's eastern borders affected the local road system. In 106 C.E. the Romans annexed the Nabataean kingdom and turned it into *Provincia Arabia.* The entire province was bisected by a newly-built road from Bostra to Aila. In time, this road was to become the backbone of the *limes* in Transjordan. The new province constituted the new Roman frontier and, as

Ptolemais-Diocaesarea road; remains of roadbed and pavement.

a result, the roads of Judaea became a rear road-network for the new line of Roman defense facing eastward.

Political and military events in Palestine during the reign of Hadrian (117-138 C.E.) had a decisive effect on the country, its population, and its roads. Shortly after Hadrian's ascension there were disturbances in the Galilee, and the presence of only one legion in Judaea did not meet Rome's security requirements. Therefore it was decided to introduce a second legion and to station it in a camp at Kfar Otnay (later Legio) near Megiddo—undoubtedly to serve as a buffer between the two large Jewish areas of Judaea and the Galilee. A milestone from 120 C.E., recently discovered on the Ptolemais—Diocaesarea road (*ZPE* 33 (1979):149-156), indicates that the legion was the second Traiana (later replaced by the sixth legion, Ferrata). Another milestone, from the Diocaesarea—Legio road that, according to a new and revised reading, also dates to 120 C.E. (*Latomus* 38 (1979):54-66), specifically mentions that year as the one in which the aforementioned road was laid (*fecit*). We may assume that during this period additional roads were constructed leading to the new legionary

camp. In 130 C.E. the Roman emperor paid a visit to Judaea and reorganized the administration there, just as he had done in other provinces. Within the framework of this visit, construction was undertaken along the Jerusalem—Bet Guvrin, Legio—Diocaesarea, and Jerusalem—Hebron roads, and probably elsewhere as well.

In terms of our subject, the Bar-Kokhba rebellion (132-135 C.E.) is a chapter in itself. This was one of the most serious rebellions which the Empire ever faced, and in order to suppress it the Romans had to assemble forces belonging to eight legions as well as many auxiliary units. Bar-Kokhba's insurgents conducted a basically guerrilla campaign, with extensive support from the local Jewish population. This support was active, in the form of the clandestine supply of provisions and shelter, as well as passive, in the form of not cooperating with the enemy. The rebels used to locate their bases in caves and tunnels, often organized as complex subterranean installations (Cassius Dio LXIX, 12-14). They hid in these installations when the Romans approached in great numbers, and used them as bases for surprise offensive operations. Thus, even when the Roman troops were numerically overwhelming, Bar-Kokhba's men could still fight, and even choose their own time and place for action. In order to subdue the Jews, the Romans undertook a tactic of slow but methodical advance into the areas of revolt, laying siege and systematically destroying the underground installations, the surrounding settlements which supported them and, finally, Bar-Kokhba's main stronghold at Betar. For this purpose, the Romans necessarily improved the existing road network and built new routes leading to the regions of fighting, often located in remote areas. Although no milestones have yet been found from the period of Bar-Kokhba's war, there is no doubt that large-scale road building was indeed undertaken by the Roman army for immediate military use. Some of the roads thus built were improved and turned into highways at a later date, and only then provided with milestones.

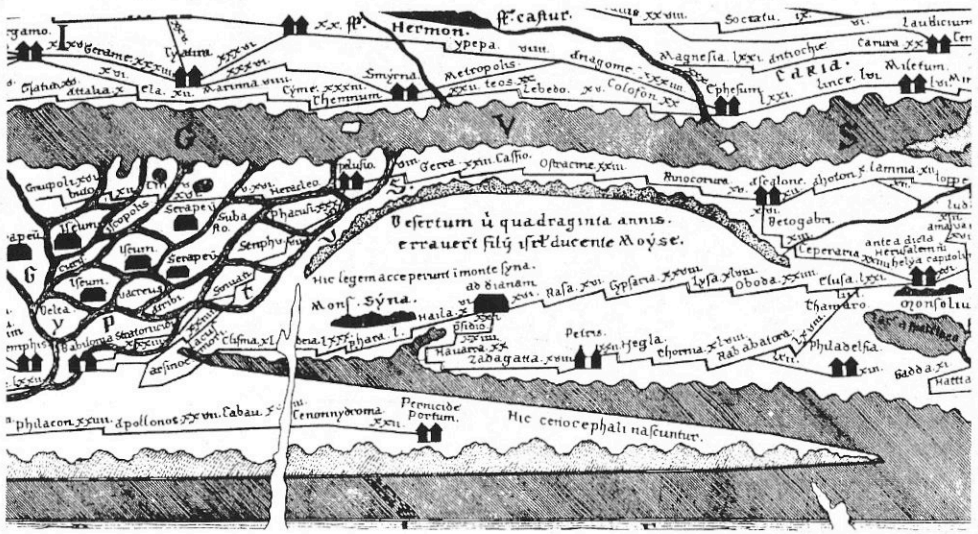
After suppressing the revolt, the Roman administration undertook a new policy in order to prevent another uprising. Jerusalem, which had earlier been turned into a Roman city called Aelia Capitolina, was rebuilt and declared off-limits to Jews. The name of the province was changed as well; henceforth it was called *Syria-Palaestina*. From a military document of 139 C.E. (*CIL* XVI, 87) we learn that the governor had at his disposal large military forces which included—besides the Sixth and Tenth Legions—twelve infantry and three cavalry units. The Roman administration realized that the efficiency of these forces was dependent upon their ability to move quickly to possible centers of insurrection; thus, the road network would have to be serviceable at all times. The many milestones dating from the middle of the second century onward attest that this aim was realized. The largest group of milestones that has survived was erected at the beginning of the reign of Marcus Aurelius; it consists of two dozen stones, located along the main arteries of *Palaestina* in

162 C.E. Our conclusion that the road network underwent general repairs in that year fits well with what is known from the *Historia Augusta* (Vita Marci, 11, 5), which relates that one of the ruler's first acts upon ascending the throne in 161 C.E. was to repair the roads and highways throughout the Empire.

Here we must mention the Peutinger Table. This map, made public in the beginning of the sixteenth century and purchased by the scholar Conrad Peutinger, had been drawn by an unknown monk from Colmar, France, in the thirteenth century. It describes the road network of the Roman Empire in detail, includes the names of cities and of important stations, and indicates the distances between them. It is probably a copy of a map drawn in the fourth century, but it is based on even earlier information. Although this is not the place to deal with the dating of the Peutinger Table, some comments are in order regarding that portion depicting Palestine.

The following coastal cities of the Roman period are mentioned: Betogabri (Bet Guvrin), Luddis (Lydda), and Amavante (Emmaus). They became Roman cities during the Severan dynasty and were renamed Eleutheropolis, Diospolis and Nicopolis respectively. Mention of the earlier names indicates that the portion of the map that depicts Palestine is based on a pre-Severan reality. On the other hand, Aelia Capitolina appears with the additional explanation "previously called Jerusalem," and the name (Syria) Palaestina is used to describe the entire land, indicating that the map was composed after 135 C.E. Thus, the Peutinger Table reflects the situation in this area during the Antonine period, i.e., the second half of the second century C.E. It is interesting to note that the road network in the map is very similar to the one indicated by the known milestones from 162 C.E.

The Severan period (193-235 C.E.) was also marked by much road-building. Numerous milestones bear witness to the repair and maintenance of many of the main roads, and also to the extensive construction of new roads connecting the new cities of Eleutheropolis, Diospolis, and Nicopolis. Given the contemporary peaceful situation, we may assume that the extensive new roadworks were undertaken in order to serve not only the military but also the civil administration. There are various indications that the hold of the Roman army on Palestine had loosened, and that fewer army units were stationed in the province from the middle of the second century C.E. An inscription of 145 C.E. states that a unit (*vexillatio*) of the Sixth Legion was stationed in North Africa (*CIL* VIII, 10230). Another inscription dating from the middle of the third century C.E. tells of the deployment of a military unit from Palestine on the eastern border of Transjordan;[3] at a certain stage the Tenth Legion also moved, from Jerusalem to Aila. The impression is that this was a gradual process which intensified as the Romans' fear of insurgence and rioting within the province subsided. We may assume that alongside this process, economic and commercial aspects of the civil administration gained importance in all matters connected with the development and maintenance of the road network.



Portion of the Peutinger Table showing the southern part of Palestine.

The Road Network

In the early decades of the third century C.E. the road network in Palestine achieved its maximal development, with four north-south arteries: a) the coastal road, beginning in Antioch and ending in Alexandria, via Tyre—Ptolemais—Caesarea—Apollonia—Jaffa—Iamnia—Ascalon—Gaza; b) the Caesarea—Antipatris—Diospolis—Eleutheropolis route with branches to the Hebron area and to Berosaba; c) the road along the watershed: Diocaesarea—Legio—Neapolis—Jerusalem—Hebron, branching to Berosaba and to Mampsis; d) the road along the Jordan Valley, from Paneas, probably along the eastern bank of the Jordan and the sea of Galilee to Scythopolis; and from Scythopolis to Neapolis, or to Jerusalem via Jericho.

The network also included a system of east-west roads: a) Tyre—Paneas—Damascus; b) Ptolemais—Diocaesarea—Tiberias, and from there to Gadara and to Bostra; c) Caesarea—Legio—Scythopolis, and from there to Pella and to Gerasa; d) Caesarea—Sebaste—Neapolis—Coreae, and from there to Philadelphia; e) Antipatris—Gophna—Jericho; f) Jaffa—Diospolis—Bet Horon—Jerusalem—Jericho—then to Esbus; g) Diospolis—Nicopolis—Jerusalem; h) Ascalon—Eleutheropolis—Jerusalem; i) Gaza—Berosaba, branching to Malata or to Mampsis.

The road network of Palestine was, therefore, an integrated system of north-south and east-west routes. Where these roads intersected, there were impor-

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The Scorpion Pass; segment levelled with gravel and paved with large stones.

tant junctions, such as Scythopolis, Legio, Caesarea, Neapolis, Antipatris, Diospolis, Nicopolis, Eleutheropolis, Hebron, and Jericho. These surrounded the main junction, Aelia Capitolina, i.e. Jerusalem, which constituted the heart of the network. Jerusalem became the center of the entire Roman road system in Palestine because of its strategic importance and its traditional centrality. That seems to be one of the reasons why the Romans chose Jerusalem to serve as a permanent base of the Tenth Legion for two hundred years.

In the first to third centuries C.E., the Negev was outside the borders of the province of Syria-Palaestina (only at the end of the third century was it added to the province), but the routes traversing the Negev were a direct continuation of the country's road network. It is therefore important at least to mention the most important of those roads. The Negev network consisted of three parallel routes which followed the curving coastline of the Mediterranean Sea, fanning out as they progressed southwards. These were: the Ascalon—Gaza—Rhinocorura section of the coastal road; the Hebron—Berosaba—Elusa—Nessana road which continued into Sinai; and the Hebron—Mampsis—Oboda road. Three other routes, running diagonally from northwest to southeast, merged into and connected with the previous roads: the Gaza—Berosaba—Mampsis road, the Gaza—Elusa—Oboda road, and the route from Gaza to Aila along the western fringes of the Negev highlands. The natural hub of the diagonal roads and, in fact, of the whole Negev road network was the city of Gaza which was of paramount importance during the Roman and Byzantine period.

In addition the Roman administration built and maintained one central

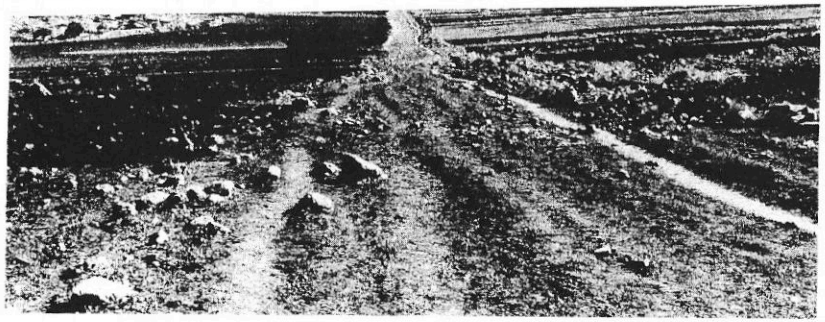
road. Various sections of this road, as well as installations alongside it, are preserved to this day. The road begins in Jerusalem, continues southward to Mampsis, passing through Hebron and Chermela; then it forks eastward to the Transjordan plateau, and southward to the Scorpion pass and Tamara. From the latter site one could continue east to the Phainon copper mines and the plateau of Edom, southeast to Petra, or south to Aila.

Later Developments

Milestones dated to the reign of Maximinus (235-238 C.E.), Diocletian (284-305), and Constantine (who ruled in the east during the years 324-337), attest to the fact that after the Severan period, the Romans continued to maintain the road network in Palestine. It is true that fewer milestones were erected during later periods, but various historical sources tell us of the extensive use of the roads during the late Roman and the Byzantine periods; such use would have required constant maintenance of the road network. Among these historical sources are the various *Itineraria,* as well as the *Onomasticon* of Eusebius which, together with the Latin translation of Jerome, provide a mine of information on the road network in Palestine during this period.

Places connected with the activities of Jesus and with early Christian tradition became, during the Byzantine period, focal points for pilgrimages from the entire Christian world. These pilgrimages greatly increased the use of the roads in the Holy Land. In this connection, a milestone discovered north of Lydda is of special interest. The stone, inscribed in Greek, indicates the distance of four miles from Antipatris. Instead of including the normal Roman formula mentioning the ruler's name, the milestone is decorated with a cross, indicating that its date is Byzantine. Two additional milestones of the same type, but without crosses, have been discovered—one south of Iamnia, indicating the distance of four miles from that settlement; the other, north of Nicopolis, atop an earlier inscription, indicating the distance of two miles from that town.

Widespread use of the road-network continued during the beginning of the Arab period. Milestones on the Jericho—Jerusalem and Jerusalem—Lydda roads, inscribed in Arabic and dating to the reign of Abd al-Malik (685-705 C.E.), specifically mention roadwork and maintenance carried out by order of the Caliph.[4] An investigation made by the author along the Jerusalem—Bet Guvrin road indicates that this road was also repaired, probably during the same period. Undoubtedly these projects were part of the general policy of several Umayyad rulers, the most notable being Abd al-Malik who sought to make Jerusalem a focus for Muslim pilgrimages. However, after the fall of the Umayyad dynasty in the middle of the eighth century and the ascent of the Abbasids, the country's importance dwindled in the eyes of the central government, an attitude that affected the maintenance of the road network.

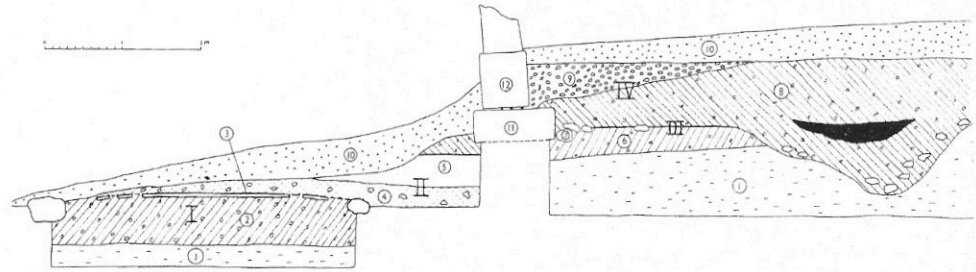


Neapolis-Coreae road; the roadbed, untouched by farmers.

Criteria Guiding Road Construction

What where the Roman techniques of roadlaying, and how did they choose and plan the proposed routes?

In the valleys and flatlands, the Romans chose as straight a route as possible; avoidance of unnecessary curves minimized construction and maintenance costs and shortened travel time. However, when there was a need to circumvent areas that would make roadlaying difficult, the engineers did not hesitate to do so. One example is the Caesarea—Legio—Scythopolis road which in its first section, in the Sharon plain, makes a broad turn northward in order to skirt a forested area that covered the Pardes Ḥanna region of today. For security reasons the Romans tried to avoid routing roads through forests. The road makes another northerly detour in order to avoid the ascent and descent from the Jezreel ridge. In mountainous areas the Romans usually chose to route roads along the top of the ridge or at least high up along the slope (where it was possible to see, without being seen), maintaining the same height as much as possible. The Romans tried to avoid deep valleys or narrow river-beds for two reasons: the danger of a topographically disadvantageous position in the event of a hostile encounter, and the technical difficulties of road maintenance in such places. The Scythopolis—Neapolis road, which in its central part follows the upper slopes of Wadi Ḥishna and does not descend into the wadi channel other than to cross from one side to the other, illustrates this principle. We can observe a similar situation in the roads that ascend to the central hills area. In this case, the Romans chose to route the road along the top of a ridge or along an upper slope. Another good example is the Nicopolis—Jerusalem road which was routed several hundred meters north of Sha'ar haGai atop a gently ascending ridge, unlike the present road which follows the narrow river bed of Naḥal Naḥshon. When topographical conditions dictated an ascent within a riverbed—as they do, for instance, on the road from Jericho to Jerusalem—the Roman engineers tried to "pull" the route as high as possible along one of the slopes.



Cross-section of the Jerusalem—Eleutheropolis road, at mile two, north of Eleutheropolis (Bet Guvrin).

1. virgin soil
I,2. foundation of earth, small, and medium-sized stones
I,3. pavement of ground chalk
II,4. foundation of earth and small stones
II,5. pavement of ground chalk
III,6. foundation of earth and small stones
III,7. pavement of well-fitted medium-sized flat stones
IV,8. foundation of sand with stones of various sizes, pocket of ashes and Hellenistic, Roman, and Byzantine pottery; the sand was undoubtedly taken from a nearby tell
IV,9. pavement of small stones
IV,10. upper level of fill
IV,11. plinth with milestone on top
IV,12. milestone

On the other hand, in areas with low hills, especially where the transition from hill to valley is gradual, the Romans preferred to build their roads in the wadi and river valleys, although close to one of the slopes; roads of this type are found in the Eleutheropolis area, especially those going from Bet Guvrin northeast toward Jerusalem, and southeast toward the Hebron ridge. The usual process of roadbuilding involved cleaning, levelling and, when necessary, deepening the roadbed; laying curbstones along the sides of the road; filling in the roadbed; and paving the surface. Usually drainage ditches were dug along both sides of the road. The building materials were taken from the immediate vicinity. Large to medium-sized fieldstones were used for curbing; earth together with stones of varying sizes formed the roadbed—depending on the available materials. The pavement was made either of naturally flat or hewn stones that were fit together, or of a layer of gravel, river pebbles, or ground chalk. Excavations have shown that the two earliest phases of the road leading from Eleutheropolis to the northeast were paved with a layer of ground chalk. The third phase was paved with well-fitted medium-sized flat stones, while the last phase, dating to the early Arab period, was paved with a layer of small stones. Each of the four building phases consisted of two layers: roadbed and

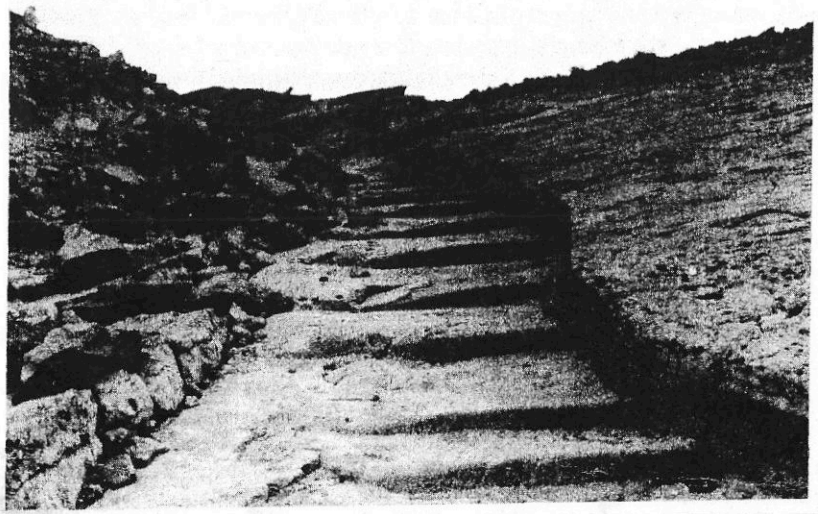
Ma'aleh Dragot; levelled bedrock used as road surface.

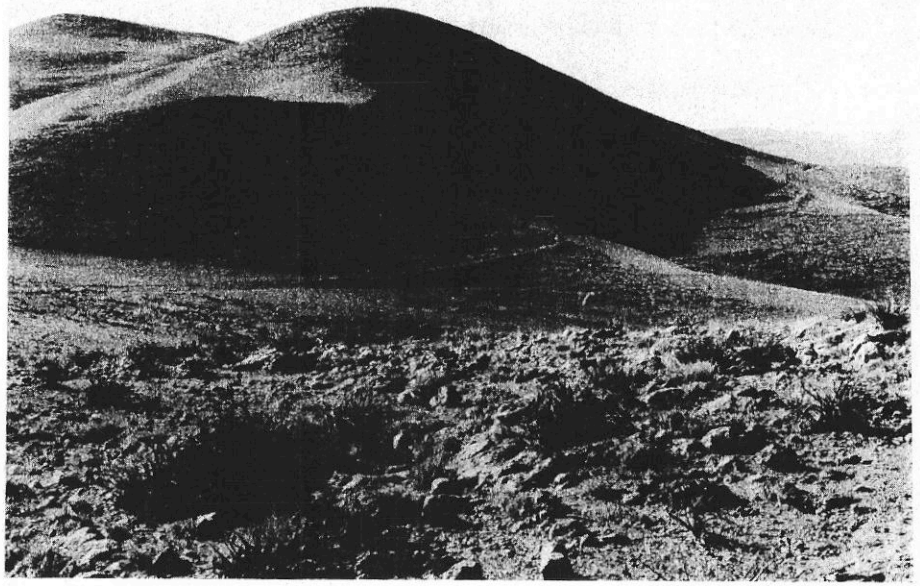
pavement. Sections dug across the Scythopolis—Legio and the Gophna—Jaffa roads provided a similar picture, of two layers.

Road construction in the mountain region and along the foothills required additional work in order to prepare a sufficiently wide roadbed. This often entailed major quarrying operations on one side of the road, and the construction of high supporting walls on the other. Often, considerable labor was invested in levelling rocky terrain; large stone surfaces thus obtained were integrated into the man-made pavement of the road. This can be seen in several roads in the hill area, such as that ascending from Nicopolis to Jerusalem.

There are also instances where a fairly steep slope had to be prepared. In such places, as Ma'aleh-Adumim (east of Jerusalem), Bet Ḥoron, and the ascent from the Elah valley (southwest of Jerusalem), steps were cut into the bedrock. In Ma'aleh Dragot (south of Chermela), however, steps were built up. In all cases the steps were used as is, and not as a stepped roadbed. The existence of steps along some of the most important roads in the country raises the question of transportation by wagons on those roads. It is unlikely that the steps at Ma'aleh Dragot could hold the weight of a loaded wagon; similarly in the Scorpion pass there are several stepped segments of road, with slopes so

The Scorpion Pass, south of Mampsis; steps hewn in bedrock.





Neapolis-Coreae road; segment stretching along foothill.

steep that one cannot imagine wagon traffic along them. The impression is, therefore, that the transport of goods on roads with stepped segments was carried out with beasts of burden. When the Romans wanted to avoid building steps on steep slopes, they resorted to serpentine routes with relatively easy gradients, as was the case in the eastern end of the Neapolis—Coreae road and in Ma'aleh Tamar (east of Mampsis).

The Romans were expert bridge builders. Because of their experience in major building operations incorporating arches and vaults, and in the use of cement, building bridges was not an extraordinary task. As in other places throughout the Empire, the Romans did not hesitate to construct bridges in Palestine when required. The bridges ensured reliable road transportation throughout the year along the major arteries of the province, including roads that crossed winter streams and rivers. The Romans were able to construct roads along new routes that had not been usable until suitable bridges were built. A fine example can be found on the Caesarea—Apollonia—Jaffa road which crossed Naḥal Ḥadera (remains of the bridge can be seen near Kibbutz Ḥefẓiba), Naḥal Alexander, Naḥal Poleg, and the Yarkon near its mouth. This road, which appears on the Peutinger Table, was already used by Roman troops during the First Revolt (*War* 4, 11, 5 (663)).

To sum up, the Romans attempted in general to adjust roadbuilding to the surroundings, but when necessary they employed all the resources at their disposal and used their extensive knowledge to modify the existing conditions to their needs.

The Milestones

The Romans usually erected milestones along the important roads at fixed intervals of one Roman mile, which is one thousand double paces (*mille passus*). The length of the Roman mile was 1482 meters, although in the eastern empire they used the Philetherian mile (known, too, as the "Egyptian" mile) whose length was 1575 meters. Measurements of the section between the third and fourth mile-stations along the Eleutheropolis—Hebron road resulted in a mile of 1635 meters. Another section, partly visible between two mile-stations along the Gophna—Jaffa road, has a length of 2100 meters. Measurements made along the road going south from Oboda gave no uniform units of length. These results do not indicate clearly what kind of linear unit was in use in Judaea, and additional measurements are necessary. The problem is that measurements should be made on a road segment that is completely preserved, and between two original groupings of milestones, located *in situ*. Today, such a segment is virtually impossible to find.

Milestones discovered in Israel indicate that distances were measured from the major cities: Paneas, Hippos, Scythopolis, Diocaesarea, Ptolemais, Legio, Caesarea, Neapolis, Jaffa, Antipatris, Iamnia, Nicopolis, Eleutheropolis, and Aelia Capitolina. These cities, as already noted, were also main junctions on the country's road network. The question is, of course, where did the measurement begin—from the city gate, or from elsewhere in the city? North of Caesarea a milestone indicating the distance of two miles from the city was found three kilometers from the *center* of the city. It is therefore possible that the starting point of the road was the well-known tetrapylon situated in the city. Measurement of distances between mile-stations found along several roads to Scythopolis and Eleutheropolis indicates that the junction of these roads was within the cities. The evidence seems to imply that public monuments within the cities provided the initial points for measuring distances along the roads. If this is the case, the pillar appearing on the Madaba map within the city of Jerusalem may not be so enigmatic.

Thus far, close to five hundred milestones have been discovered in Israel; about one quarter of them contain partially or completely decipherable inscriptions. Usually the milestones were erected in groups of up to ten, or even more. One stone marked the construction of the road, while the others indicated various repairs and improvements undertaken along its length. The milestones in Israel are generally made of local limestone and are 150-250 cm. (5-8 ft.) high. They are of a standard shape: a square base, on which rests a cylinder that is often decorated with a border. The cylinder bears an incised inscription usually accented with red paint.

The inscriptions usually consist of two parts. The first is the official section, written in Latin, and includes the name and title of the Roman ruler during

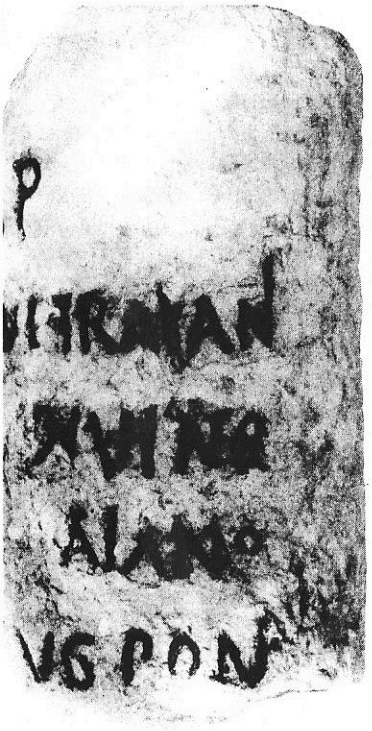
whose reign the road was constructed or repaired. The second is the functional part, written in Greek which was the country's spoken language; it lists the name of and distance from the major city where the road begins, and it may often include the name of and distance to the city to which the road leads. The habit of using Greek seems to have started during Hadrian's reign, and later on that practice became standard.

While milestones were ostensibly erected to record road construction for posterity as well as to indicate distance, they actually filled a far more important function. For the Romans, their primary role was to propagandize the idea of Rome and its Empire. A traveller from Jerusalem to Eleutheropolis, for example, a distance of thirty miles, would encounter with mathematical precision twenty-nine groups of milestones proclaiming the names and titles of the great rulers of the Roman Empire, past and present. This "brainwashing" was meant to make the traveller aware of the might of the Roman government, past and present, and convince him that no power on earth would be able to challenge it in the future. We may assume that during the uprising against Rome, the rebels shattered these emblems; this would explain the paucity of milestones remaining from the period preceding the Bar-Kokhba rebellion, as compared with the large number of milestones from the following period. Erecting milestones also was a way to express the loyalty of the governer, his troops and province, to the emperor.

Milestones were also important geographically, with each mile-station serving not only to measure distance along the road, but also to indicate location within the general area. Thus, the network of milestones constituted a kind of grid reference system that covered the entire country, which could be used to guide soldiers, or civilians, to their destination, or to determine their whereabouts when travelling. In his *Onomasticon*, for example, Eusebius succeeds in locating a long list of settlements and sites by the use of mile-stations as reference markers.

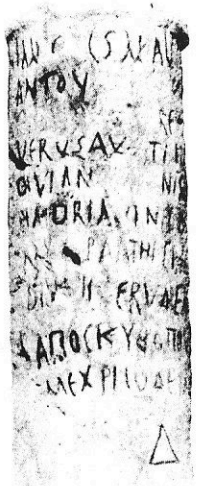
Maintenance and Traffic

During wartime, the roads were under the responsibility of the military authorities. In times of peace, however, the roads were under the jurisdiction of the provincial administration or, some times, of a special commissioner sent by the central authority. In wartime, the roads were built and maintained by the soldiers of the Roman army (as noted in the earlier quote from Josephus). We find a visual example of roadbuilding during a military campaign in two scenes from Trajan's Column in Rome. The army was often deployed for roadbuilding in times of peace as well, in order to avoid laxity arising from idleness. But the Roman administration also drew upon urban institutions and recruited

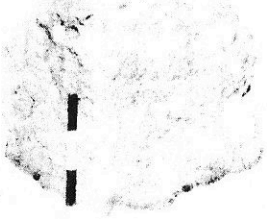


Milestone of Hadrian, discovered at mile six of the Scythopolis—Jericho road.

[I]mp(eratori)
[Caesari d]ivi Traiani
[Parthici fil(io)] divi Ner
4 [vae nep(oti) Tr]aiano
[Hadriano A]ug(usto) pon(tifici)
[max(imo) trib(unicia) pot(estate)....]



Imp(erator) C[a]es(ar) M(arcus) Au[re]l[ius]
Antoṇ[inus Aug(ustus) p(ontifex) m(aximus)
t(ribuniciae) p(otestatis)]
[XVI co(n)s(ul) III et Imp(erator) Caes(ar)
L(ucius) Aurel(ius)]
4 Verus Au[g(ustus)] t(ribuniciae) p(otestatis) II
c[o(n)s(ul)]I
divi An[toni]ni fili divi
Hadria[n]i n[ep(otes)] divi Trai[a]
ni Parthici pronep(otes)
8 divi Nervae abnep(otes)
'Από Σκγθοπόλεως
μέχρι ὧδε μίλια
Δ



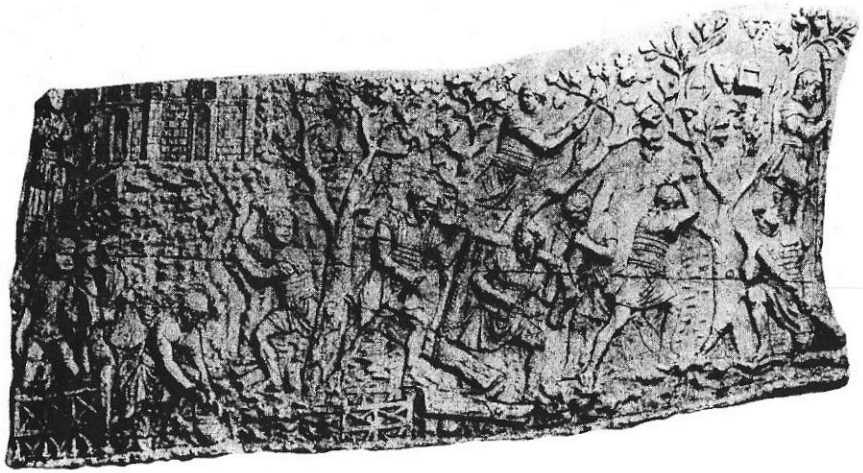
Milestone of Marcus Aurelius, dated 162 C.E., designating the distance of four miles from Scythopolis; found on the Roman road leading northward.

Milestone of Septimius Severus, indicating the distance of two miles from Caesarea; discovered north of the city.

[Imperatori Caesari]
L(ucio) Septimio S[eve]ro
Pio Pertinaci Aug(usto) [Arab(ico)]
4 [A]diabenico Parthi[co]
[Max(imo)] pontif(ici) max(imo) trib(uniciae)
[pot(estatis)]
[..Imp(eratori)..] Co(n)s(uli) II proco(n)s(uli)
et [Imp(eratori) Caes(ari) M(arco)]
8 [Au]relio Antonino Aug(usto)
[Anto]n[i]no Severo Aug(usto) et
[Get]a[e] Ca[e]s(ari) Severi filio
[Antonini fra]tri Aug(usti) [n(ostri)]
12 [Από Κ]αισαρείαζ
[μίλι]α β

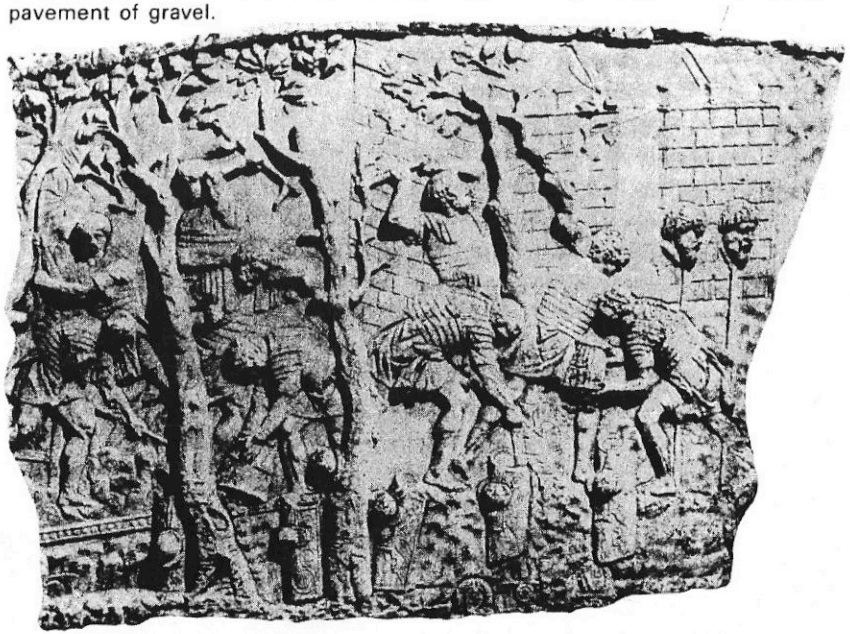
Imp(erator) Caes(ar) M(arcus) A(urelius)
Antoninus p(ius) fel(ix)
Aug(ustus) Par(thicus) max(imus)
4 Brit(annicus) max(imus) p(ontifex) max(imus)
trib(unicia) pot(estate) XVI
imp(erator) II co(n)s(ul) III p(ater) p(atriae)
pro(con)s(ul) vias et p(ontes)
8 restituit
VI
'Από Σκγθοπόλ(εως)
ς

Milestone of Caracalla, dated 213 C.E., discovered at mile six of the Scythopolis — Jericho road.



Scene on Trajan's column in Rome; Roman soldiers constructing a road in a forested, mountainous area.

Trajan's column; Roman soldiers cutting trees, levelling the roadbed, and laying pavement of gravel.



manpower from the provincial population. This is clearly reflected in a rabbinic text of the period:

> You were unwilling to repair the roads and streets leading up to the Temple; now you have to keep in repair the posts and stations on the road to the royal cities. (*Mekhilta of R. Ishmael, Baḥodesh,* ch. 1)

On the other hand, there were elements that hampered the use of roads, the most significant being robbery. Both Roman and talmudic sources contain many stories and references to incidents of robbery along highways. The Roman government tried to combat this evil, initially with mobile military units that constantly patrolled the roads. At a later stage, permanent forces were stationed along them, at guardposts, watch towers and fortified check points situated at road junctions, major look-out points, and near water sources, to safeguard travellers.

During the Roman period, the transportation requirements of the administration and the army were extensive and broad in range. All kinds of officials —tax collectors and assessing officers, commissioners and carriers of the imperial mail, governor's deputies, and those in charge of security on the roads—travelled frequently, on horseback or in wagons. Military transportation included the movement of army units, with the troops travelling by foot, except for ranking officers and the cavalry. Military transport included arms and war machines, food supplies and camp equipment. The Romans favored the use of wagons when moving supplies to large armies, as depicted, for example, on the columns of Trajan and Marcus Aurelius, and on the arch of Septimius Severus in Rome. All this seems to have had a major impact upon the policy of road improvement in the country during the military campaigns the Romans undertook in the East in the second and third centuries.

In the civilian realm, the roads served as the arteries of commercial enterprise. Goods were transported by donkey, mule, and camel, as well as on wagons and carts of various kinds that were pulled by horses, mules, donkeys, or oxen. People who travelled for business, administrative, or legal purposes made their way in a horse or mule-drawn wagon, or on the back of a horse, donkey, or camel. Often they travelled by foot. There were also religious reasons for travelling; people visited shrines or holy persons, or travelled to various schools of religious learning. Others went to health-spas, while some simply travelled to see the world—a common occurrence in the Roman period. The resulting extensive and lively travel along the roadways in Palestine contributed greatly to the growth of the economy and to the expanding settlement of the country during the Roman and Byzantine periods.

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1 The International Curatorium is headed by G. Walser, and its headquarters are in Switzerland. The Israel Milestone Committee consists of M. Gichon (Chairman), S. Perlman and S. Applebaum of Tel Aviv University, and Y. Landau of the Israel Government Department of Antiquities and Museums. The Committee's field and research work is undertaken by B. Isaac and the writer of the present article.

2 During the Roman period, cities in Palestine were given Roman names:
Aelia Capitolina = Jerusalem
Aila = Aqaba
Bostra = Basra (S. Syria)
Diocaesarea = Sepphoris (Zippori)
Diospolis = Lydda (Lod)
Eleutheropolis = Bet Guvrin
Legio = Lejjun (near Meggido)
Neapolis = Nablus (Shechem)
Nicopolis = Emmaus
Philadelphia = Amman
Ptolemais = Acre
Scythopolis = Bet She'an

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