

## THE ROMAN LIMES IN GERMANY

By OLWEN BROGAN

### ABBREVIATIONS USED IN THE NOTES

<i>Arch. Anz.</i>	<i>Archäologischer Anzeiger.</i>
<i>Ber.</i> ..	<i>Berichte der rom.-germ. Kommission.</i>
<i>B. J.</i> ..	<i>Bonner Jahrbucher.</i>
<i>C.I.L.</i> ..	<i>Corpus Inscriptionum Latinarum.</i>
<i>Ger.</i> ..	<i>Germania. Korrespondenzbl. der rom.-germ. Kommission.</i>
<i>G.R.</i> ..	<i>Germania Romana, Ein Bilder Atlas</i> , 2nd edn., 1924-30.
<i>M.Z.</i> ..	<i>Mainzer Zeitschrift.</i>
<i>O.R.L.</i> ..	<i>Obergermanisch-Raetische Limes des Römerreiches. Lieferungen.</i> In all references, the serial numbers of the forts or of the 'stretches' of the limes are given, as the order of the Lieferungen differs from the scheme for binding the work.
<i>P-W.</i> ..	<i>Pauly-Wissowa Real Encyclopädie.</i>
<i>R.W.</i> ..	Hertlein, Goessler and Paret: <i>Die Römer in Württemberg</i> , i-iii, 1928, 1930 and 1932.
<i>S.K.G.</i> ..	K. Schumacher, <i>Siedelungs- und Kultur-Geschichte der Rheinlande von der Urzeit bis in das Mittelalter</i> : I. Die vorromische Zeit, 1921. II, Die romische Periode, 1923.
<i>S.W.</i> ..	G. Wolff, <i>Die südliche Wetterau</i> . 1913.
<i>W.Z.</i> ..	<i>Westdeutsche Zeitschrift.</i>

The term *limes*,<sup>1</sup> which came to mean a frontier, was long used by the Romans in a general way for any sort of track or path and, more particularly, for the path running between allotments of land. Poets used it for the path of a ship across the sea, or of the sun across the sky, or for the lane hewn through the ranks of the enemy by a doughty champion. In

<sup>1</sup> For a full discussion of the term see W. Gebert, 'Limes. Untersuchungen zur Erklärung des Wortes und zu seiner Anwendung,' *B. J.*, cxix,

1910, 158-205. See also R. G. Collingwood, *The Archaeology of Roman Britain*, 1930, 65.

military terminology it was applied to the line of advance into enemy territory, and hence to the road along which the advance was made. It is in this sense that the term is used by authors describing the wars of the first century A.D. Towards the end of the century it came further to be applied to the outermost road—the frontier road—marking the limit of the Roman advance, and from that the transition to land, as distinct from river frontier, and then to frontier in general, was easy. In the end it came to be used for whole frontier districts, and their inhabitants were called the *limitanei*.

The Roman land frontier in Germany—the *Limes Germanicus* and the *Limes Raeticus*—is the product of certain factors which made themselves felt even in the time of the Julio-Claudian emperors, and which finally compelled a modification in the policy of adhering to a Rhine frontier adopted by Augustus and Tiberius after the defeat of Varus.<sup>1</sup> The total length of the frontier finally drawn from Rhine to Danube is some three hundred miles, the Upper German frontier being 239 miles long, including 32 miles of river frontier along the Main, and the Raetian stone wall being 103 miles long. The history of the Roman advance across Rhine and Danube and the general topography of the limes has been dealt with by several British writers<sup>2</sup>; an illustrated description of the actual frontier works themselves, in their various stages, is not yet available in English, and the present paper, summarising briefly a few of the notable results obtained by the German Reichs-Limes Kommission,

<sup>1</sup> For the pre-Flavian history of the Rhine and Danube frontiers see R. Syme in *Cambridge Ancient History*, x, chaps. 12 and 23 (with bibliography). For two views of this period, cf. H. Hofmann, 'Zur Frage der vorflavischen Okkupation des rechten Rheinuferes,' *M.Z.*, vi, 1911, 31–34, and W. Barthel in *Ber.*, vi, 1910–11, 122–5.

<sup>2</sup> H. F. Pelham, 'The Roman Frontier in Southern Germany,' in *Essays on Roman History*, collected by

F. Haverfield, 1911, 179–211; B. W. Henderson, *Five Roman Emperors*, 1927, especially chapters v and vi; T. Hodgkin, 'The Pfahlgraben: an essay towards a description of the barrier of the Roman Empire between the Danube and the Rhine,' *Archaeologia Aeliana*, 1882; J. L. G. Mowat, *A Walk along the Teufelsmauer and Pfahlgraben*, 1885; O. Brogan, 'An Introduction to the Roman Land Frontier in Germany,' *Greece and Rome*, 1933, 23–30.

is an essay towards filling this gap.<sup>1</sup> The writer wishes to express her gratitude to Professor Ernst Fabricius, Director of the Kommission, for his generosity in giving permission for the reproduction of diagrams and photographs from the Kommission's publications; to Dr. G. Bersu, until recently Director of the Archaeological Institute at Frankfort, for permission to work in the library of the Institute, and to Dr. K. Stade, for his invaluable help and criticism during the preparation of the article and the map that goes with it.

Across the Rhine, stretching north-east from opposite Mainz, is the fertile valley known as the Wetterau, lying between two ranges of hills, the Taunus and the Vogelsberg. This region has always been tempting to settlers, and its inhabitants seem early to have been friendly to Rome<sup>2</sup>; further west, the hot springs of Wiesbaden on the southern slopes of the Taunus attracted the Romans.<sup>3</sup> This delectable

<sup>1</sup> The Reichs-Limes Kommission, whose headquarters are now at Freiburg, was founded in 1892, and since 1894 has published a series of *Lieferungen*, containing descriptions of all limes forts excavated, and of the limes itself. In the early days, until 1903, a *Limesblatt*, describing current investigations, was published. Reports also appeared in the *Archäologischer Anzeiger*. One result of the work of the Reichs-Limes Kommission has been the development of the Romisch-Germanische Kommission of the Deutsches-Archäologisches Institut (of Berlin), with a special institute at Frankfurt-am-Main devoted to German archaeology, founded in 1904. By the Romisch-Germanische Kommission have been published the *Berichte*, annual reports issued since 1903; *Germania*, a periodical which succeeded, in 1917, the *Rom.-Germ. Korrespondenzblatt* (1908-1916); and a number of special publications, such as *Germania-Romana, ein Bilder-Atlas*, 2nd edn., 1924-30, a most useful introduction to the remains of Roman Germany, and more specialised works on pottery, etc. The best general description of the limes and its history is E. Fabricius' article, 'Limes,' in Pauly-Wissowa, *Real-*

*Encyclopadie*. K. Stade, 'Der römische Limes in Baden,' *Badische Fundberichte*, ii, 1929, 1-20, contains useful recent information about the limes as a whole, as well as a detailed account of its remains in Baden.

<sup>2</sup> Tacitus, *Germ.*, 29; *S.W.*, 8 ff. and 19; *S.K.G.*, ii, 154. J. Klose, *Roms. Klientel-Randstaaten am Rhein und a.d. Donau*, 1934, 53 ff.

<sup>3</sup> An early fort here can probably be ascribed to Augustus, another belongs to the Caligula-Claudius period (*O.R.L.* 31, 1909, 66 ff.), and the waters were evidently early in use (*C.I.L.*, xiii, p. 468, and *O.R.L.*, *op. cit.* for early inscriptions, of which one, 7575, may be previous to 43 A.D.). The hot springs were known to Pliny (*N.H.* 31, 20), *sunt et Mattiaci in Germania fontes calidi trans Rhenum, quorum haustus triduo fervet*. The silver mine mentioned by Tacitus (*Ann.* xi, 20) probably lay somewhere on the lower Lahn, but, as Tacitus himself notices, its yield was disappointing, so that it can hardly be numbered among the most powerful attractions which led the Flavian emperors to annex new territory (*S.K.G.*, ii, 253. O. Dahm, 'Der röm. Bergbau an der unteren Lahn,' *B. Z.*, ci, 1897, 117-127. Dahm thinks that later on mining operations were resumed).

country, and the Roman land on the left bank of the river, was constantly menaced by the Chatti, one of the most warlike and intelligent of all the German tribes, whose stronghold Mattium had been burnt by Germanicus in A.D. 16.<sup>1</sup> Caligula, wishing to emulate the successes of his father, conducted a campaign across the Rhine, the history of which expedition is difficult to disentangle from the ridicule with which Roman historians covered it.<sup>2</sup> His troops did, however, occupy posts in the country of the Mattiaci, opposite Mainz, as excavation of the forts of Wiesbaden and Hofheim has shown, and he was perhaps responsible for the Roman fort at Gross-Gerau, south of the Main.<sup>3</sup> He also assigned the disciplinarian Galba to the Mainz command, with the immediate duty of dealing with the Chatti.<sup>4</sup> Claudius continued his predecessor's policy, and seems to have maintained an outpost of some sort on the Taunus, at Zugmantel north of Wiesbaden.<sup>5</sup> In 43, however, many of the picked troops of the Rhine army were withdrawn to take part in the invasion of Britain, so no extensive operations could be carried out in Germany.

Meanwhile Roman civilisation was steadily penetrating among the more peaceful inhabitants of the country across the Rhine. The Suebi Nicrotes settled on the lower Neckar were absorbing Roman influences, and it is not impossible that further to the south the waters of Baden-Baden were already used in pre-Flavian times.<sup>6</sup> The Roman occupation had crossed the Upper Rhine and Lake Constance, and was creeping towards the Neckar; troops from the fortress at Windisch had built posts along the

<sup>1</sup> Tac., *Germ.*, 30, *Ann.*, i, 56. Mattium is probably the Altenburg by Metze-Niedenstein, south-west of Cassel. Hofmeister, *Die Chatten*, I. *Mattium*, 1930.

<sup>2</sup> Suet., *Cal.* 43-51; *Vesp.* 2; Dio, lix, 21; Eutropius, vii, 12. A. Riese, 'Der Feldzug des Caligula an den Rhein,' *Neue Heidelberger Jahrb.* vi, 1896, 152-162; J. P. V. D. Balsdon, *The Emperor Gaius*, 1934, chap. iii.

<sup>3</sup> O.R.L. 31 (Wiesbaden); E.

Ritterling, 'Das frühromische Lager bei Hofheim,' *Nassauische Ann.*, 1913; W. Barthel, 'Die Erforschung des obergerman.-raetischen Limes in den Jahren 1908-1912,' *Ber.* vi, 116-133.

<sup>4</sup> Suet., *Galba*, 6. Dio, lx, 8.

<sup>5</sup> Barthel, *op. cit.*, 122.

<sup>6</sup> S.K.G., ii, 121, 135 (Suebi Nicrotes); for Baden-Baden, Hofmann, *M.Z.*, vi, 32. cf. Barthel, *op. cit.* 124.

Wutach, as far as Hüfingen, where there was certainly a Claudian, and possibly an earlier fort.<sup>1</sup> The romanisation of Raetia made strides under Claudius, to whom is assigned a road from Augsburg to the Danube near Donauworth, and a series of forts along the river itself, of which Risstissen and Unterkirchberg are the clearest cases.<sup>2</sup>

#### VESPASIAN

The catastrophes of 69-70 and the Batavian rising, which threw the frontier into confusion, demonstrated the urgency of the main factor which brought about the lay-out of the limes—the necessity of facilitating rapid communication between the armies of the Rhine and of the Danube, which the deep re-entrant angle made by the Upper Rhine and the Upper Danube so greatly hindered. Vespasian tackled the problem. The main advance was begun in 74, under the leadership of Cn. Pinarius Cornelius Clemens, who drove a road into the Black Forest up the Kinzig Valley opposite Strasbourg, to meet, on the Upper Neckar, another road coming north from Windisch.<sup>3</sup> Arae Flaviae (Rottweil) was founded to be a centre for the imperial cult in the newly-occupied territory, and a series of forts was built, the northernmost of which was Sulz, from which a road was carried to Laiz on the Danube.<sup>4</sup> Recent writers tend to

<sup>1</sup> F. Stahelin, *Die Schweiz in römischer Zeit*, 2nd edn., 1931, 160, notes 2, 3. P. Revellio, 'Kastell Hüfingen,' *Ger.*, x and xi, 1926-8.

<sup>2</sup> F. Wagner, *Die Römer in Bayern*, 4th edn., 1928, 16-17; *R.W.*, i, 21 ff. ii, 205 (Risstissen); W. Veeck, 'Das Donau-Illeerkastell Unterkirchberg,' *Ger.*, xiii, 1929, 1-7.

<sup>3</sup> The expedition of Clemens is dated by inscriptions. Clemens is recorded as legate of the upper German army on a diploma of 74, found in Hungary (*C.I.L.*, iii, p. 852), and on a Chamonix boundary stone of the same year (*C.I.L.*, xii, 113); on an inscription at Spello he is mentioned as having received the triumphal insignia *ob res in Germania prospere gestas* (*C.I.L.*, xi, 5271); there is also the Offenburg milestone

(*C.I.L.*, xiii, 9082) on the road through the Kinzig valley, recording, under him, *iter de[rectum ab Arge]n[torate in R]aetiam or, in ripam Danuvii*; inscriptions from Foligno tell of two brothers who commanded auxiliary troops at this time against the Germans (*C.I.L.*, xi, 5210, 5211). Finally, Vespasian himself was thrice saluted as Imperator in 74 (Weynand, *Art.*, *Flavius*, *P.-W.*, vi, 2664).

<sup>4</sup> *S.K.G.*, ii, 39-41 (Rottweil); *O.R.L.*, 61a (Sulz); 61b (Waldmossingen). The road system between Strasbourg and the Danube is exhaustively described by Goessler in *R.W.*, ii, 7 ff. On p. 15 he gives reasons for rejecting the view that the main Vespasianic road ran from Rottweil to Tuttlingen (*cf.* Pelham and Henderson). See also *O.R.L.*, Stretch xi, 28.

reject the old view that the expedition of Clemens was little more than a military picnic. The departure of the Helvetii and the migration of the Marcomanni had doubtless left this region sparsely inhabited, but it was not depopulated, and archaeological indications, coupled with the size of the Roman force employed, suggest that the inhabitants, whoever they were, resisted the newcomers.<sup>1</sup> Under Vespasian the Danube was also crossed lower down, by a road passing to the left bank opposite Steppberg and then bearing eastwards along the line of an old prehistoric track via Nassenfels, to return to the right bank at Eining.<sup>2</sup> This was to avoid the swamps along the south of the river between Steppberg and Eining, which rendered road-building difficult. The facts that Eining offers the first solid ground on the right bank of the river east of these swamps, and that the river immediately below enters a deep gorge difficult to cross by friend or foe, were to determine the position of the future *caput limitis*.<sup>3</sup>

Vespasian built a chain of forts east of the Rhine, above Mainz, moving across to them garrisons of the corresponding Claudian forts on the left bank of the river. Among the new stations may be noted Ladenburg, Neuenheim (Heidelberg), Baden-Baden and Offenburg.<sup>4</sup> North of Mainz Vespasian re-occupied and rebuilt the forts at Wiesbaden and Hofheim.<sup>5</sup>

#### DOMITIAN

Domitian carried on his father's work and achieved a scientific frontier reaching from Rheinbrohl to Eining. The evidence on which the dating of the

<sup>1</sup> *O.R.L.*, Str. xi, 29-33 and 35-36. The complicated fort system around Rottweil suggests a country which had to be conquered step by step and held down; Flavian forts at Geislingen, Günzburg, Aislingen and Bürghefe appear to have been burnt in Domitian's time (perhaps when the main Roman forces had been called north to fight the Chatti). Strabo, iv. 6, 9, mentions Suebi around the sources of the Danube.

<sup>2</sup> Building inscriptions date the

fort at Günzburg on the Danube to 77-78 (*R. G. Korr. Bl.*, iv, 1911, 25); that at Kosching (north of the Danube) to 80 (*O.R.L.*, 74, 24); that at Eining to 79-81 (*R. G. Korr. Bl.*, vii, 1914, 18). For Nassenfels, see F. Drexel, *Ger.*, iii, 20 f.

<sup>3</sup> *O.R.L.*, Str. xv. 9.

<sup>4</sup> Barthel, *op. cit.*, 126-30.

<sup>5</sup> *O.R.L.*, 31 (Wiesbaden), 62, 68; *O.R.L.*, 29 (Hofheim). Ritterling, *op. cit.* (above, p. 4, note 3), 95.



Domitianic frontier rests is surveyed briefly in Appendix I below. He first turned his attention to the region north of Mainz where, in 83, he campaigned successfully against the Chatti. On the southern spurs of the Taunus is a group of hill-forts, seemingly occupied at this period—admirable eyries for tribesmen accustomed to harry the peaceful inhabitants of the lowlands.<sup>1</sup> These, it can hardly be doubted, are some at least of the refuges which, according to Frontinus, Domitian laid bare.<sup>2</sup> The Taunus ridge offered a superb natural line for guarding the Rheingau and the west side of the Wetterau, and Domitian decided to occupy its outer slopes permanently, so that the Chatti could not return to their old haunts. He therefore drew his frontier from the Lahn, around the Taunus and Wetterau, to Kesselstadt on the Main, and set up outposts along it. In the winter of 88–89 it was endangered by the revolt of Antonius Saturninus, the legate at Mainz. By the time that Domitian arrived the commander of the lower Rhine army had already dealt with the rebels, but the limes had to be secured, and it was necessary to rebuild forts and

<sup>1</sup> S.K.G., i, 134, and ii, 43; S.W., 18; O.R.L., Str. iii, 41 ff.

<sup>2</sup> Frontinus, *Strategemata*, i, 3, 10. *Imperator Caesar Domitianus Augustus, cum Germani more suo e saltibus et obscuris latebris subinde impugnarent nostros tutumque regressum in profunda silvarum haberent, limitibus per centum viginti milia passuum actis non mutavit tantum statum belli, sed et subiecit dicioni suae hostes, quorum refugia nudaverat.* The meaning of the phrase *limitibus per 120 m.p. actis* has been much debated. The most obvious explanation was that it referred to some 120 mile stretch of the limes of Domitian (see Pelham, 190–1, and Henderson, 101), and the distance from Ems to Kesselstadt (probably Domitian's earliest limes) is approximately 120 Roman miles (c. 100 English miles). The objection to this is that Frontinus uses the plural, which does not suggest a single frontier, but a number of military roads. Other authorities have sought to explain the figure by substituting feet for miles and supposing Frontinus to refer to the

width of the *limites* (A. Oxé, *B.Z.*, 114–5, 1906, p. 109, note 1). Gebert (see above, p. 1, note 1) is in favour of the *limites* here being the lines of advance into enemy territory. Domitian's army is therefore believed to have advanced along a number of routes, whereby the country of the Chatti was thoroughly cleared. Some champions of this view rather weakly conclude that the 120 miles must represent the sum total of the length of these routes. An attractive solution of the figures is that suggested by Mr. R. Syme (to be given in vol. xi of the *Cambridge Ancient History*), that the phrase *per 120 m.p.* means *on a front of 120 miles*. Domitian can be imagined advancing with several columns on a front stretching from the Neuwied Basin, or Coblenz, to Kesselstadt on the Main, whereby he would be able to surround and clear the territory of the Chatti. The distance from Andernach to Kesselstadt is about 100 English miles. See, however, Fabricius' restatement of the problem, in favour of the Latin-Kesselstadt limes, *O.R.L.*, Str. iii, 45.

watch-towers destroyed by the Chatti, the allies of Saturninus.<sup>1</sup> Domitian also took this opportunity to reorganise the administration of Roman Germany. The creation of the two provinces of Germania Superior and Germania Inferior dates from this time,<sup>2</sup> and the little river Vinxt not only became the boundary between them, but determined the northern *caput limitis*, for the limes was now carried northward from Ems, round the Neuwied Basin, where a number of old tracks converged for the Rhine crossing to the Moselle route into Gaul, to Rheinbrohl, opposite the mouth of the Vinxt.<sup>3</sup>

In the Neckar-Danube country the advance begun by Vespasian was carried steadily on throughout the reign of Domitian and it is probable that Trajan perfected the road system.<sup>4</sup> A road protected by a chain of forts (sometimes called the Alb-Limes) was built along the Danube-Neckar watershed, roughly parallel to the Neckar road from Rottweil to Cannstatt. The main road from Mainz to Raetia was completed by the construction of a sector from Heidelberg to Cannstatt, via Stettfeld. From Cannstatt the road passed through the Filstal to Urspring and Faimingen, and to Augsburg and the East.<sup>5</sup>

The Neckar road did not stop at Cannstatt, but continued northwards to Wimpfen. Between Cannstatt and Wimpfen the river was the frontier at this period, and there were forts along it at intervals. It is of interest to observe that the road nevertheless runs in places along the right bank, showing the value attached to speedy communications.<sup>6</sup>

South of Kesselstadt the Main itself was the frontier as far as Worth, a convenient point of departure for the stretch heading for Wimpfen, which seems

<sup>1</sup> See below, p. 13.

<sup>2</sup> Ritterling-Groag, *Fasti des römischen Deutschland unter dem Prinzipat*, 1932, 25-6. A. Riese, *Korbl. der W.Z.*, xiv, 1895, 158-60.

<sup>3</sup> O.R.L., Str. i, 1915 (the prehistoric routes are shown on a map).

<sup>4</sup> R.W., i, 38 ff.; ii, 71 ff. and 225 ff.; cf. note 2, p. 16, below.

<sup>5</sup> R.W., i, 74-5. Kongen at first may have been the chief Upper

German point of departure for the shortest route to the Danube by Donnstetten and Urspring. The road from Vindonissa and Rottweil to northern Raetia via Kongen was of such importance that it is preserved in the Peutinger Table with Kongen (Grinario) as one of its stages. R.W., i, 19 and 43.

<sup>6</sup> *Ibid.*, 65-66. O.R.L., Str. xi, 1935, 8 ff.



to belong to the last period of Domitian's reign.<sup>1</sup> Further inland the main eastern Rhine valley road ran via Kastel, Gross-Gerau, Gernsheim, to Heidelberg (Neuenheim) and to Offenburg, where it joined the road coming from Strasbourg. When the Odenwald was taken within the empire by Domitian one branch from this road was carried to Dieburg, which became an important road centre, and another was carried through the south of the hilly country to Neckarburken.<sup>2</sup>

In Raetia Domitian continued his chain of forts north from Urspring to Heidenheim, Aalen, Oberdorf and Munningen. The position of his actual frontier line in this region is still being debated. In 1928 a newly-discovered wooden fort at Unterschwaningen was excavated by Dr. Eidam and Dr. Stade.<sup>3</sup> This lies about nine miles to the north of Munningen and resembles the Domitianic frontier stations on other parts of the limes, except that their ramparts are of earth and not of wood. It has therefore been suggested that the frontier of Domitian ran three or four miles beyond the Heidenheim-Munningen road, possibly somewhat to the rear of the later palisade.<sup>4</sup> The history of the limes in this region, and in the neighbourhood of the Rems is, indeed, by no means yet entirely elucidated. From Munningen the Domitianic road continued to Gnotzheim, Weissenburg and Pfünz, and thence to the Danube-crossing at Eining already adopted by Vespasian.<sup>5</sup> The frontier is thought to bear some relation to the net-work of prehistoric roads and to an ancient iron-working industry of this region,<sup>6</sup> traces of which, of the Roman period, occur at Pfünz and close to the salient between Kipfenberg and Eining, but how far Domitian's line coincided with the later line south-east from Gunzenhausen is a matter of debate. It was probably the

<sup>1</sup> O.R.L., Str. x, 1926, 33-4; Stade, *op. cit.*, 6, 7, 11, indicates some of the problems as to this part of the frontier which have still to be cleared up.

<sup>2</sup> Schumacher, 'Die rom. Heerstrassen zwischen Main und Neckar,' O.R.L., Str. vi, 1933, 71-102.

<sup>3</sup> O.R.L., Str. xiii, 1930, 76-99.

<sup>4</sup> O.R.L., Str. xiv, 1928, 15, 41-2; Str. xii, 1935, 22.

<sup>5</sup> O.R.L., Str. xv, 1934, 11.

<sup>6</sup> F. Winkelmann, 'Die vorrom. und rom. Strassen in Bayern zwischen Donau und Limes,' *Ber.*, xi, 1918-9, 6.

same at first, as far as the corner south-east of Weissenburg, but beyond that point it is not known.

*The Limes of the Domitianic Period*

The frontier of Domitian is marked by a series of small earth forts and wooden signal towers, which must have originally been linked by a patrol path—the limes itself, strictly speaking. A metallated road of this period along the actual frontier has not been found. The most striking quality of the Rhine-Main limes is the attention paid to military factors; tactically it is as carefully drawn as the Wall of Pius in Scotland; there is also the impress of a grand strategic plan.<sup>1</sup> The focal point of the whole northern system—the hub of the great semicircle from Neuwied to Cannstatt—was the legionary fortress at Mainz, while essential links between the fortress and the front line were the intermediate cohort and ala forts, such as Wiesbaden, Heddernheim, Okarben. The Wetterau bastion of Roman territory constituted a dangerous salient which needed specially strong measures for its defence, and Wolff claims that the forts there are bound together by a road system more complex than that of any other section of the imperial frontiers.<sup>2</sup> To reach the Neuwied basin from Mainz the best route lay along the left bank of the Rhine (the road along the right bank has only become possible with the invention of blasting powder) to a point whence the troops could be ferried across the river to Bendorf, unless, indeed, there was a bridge across the Rhine at Coblenz, as is believed by some scholars.<sup>3</sup>

The limes itself is kept wherever possible just below the crest on the outer—German—side of the hills. Descents in crossing ravines are made as short as possible, and care is taken to avoid being commanded from outside. In the thirty-mile stretch between Rhine and Lahn less than two miles are weak defensively. Domitian's Mümling-Neckar line follows

<sup>1</sup> O.R.L., Str. i, 19-22; E. Strassen in der Wetterau,' W.Z., Fabricius, 'Mainz und der Limes,' xvi, 1897, 1-46.  
M.Z., ii, 1907, 4-10.

<sup>2</sup> S.W., 19 ff.; 'Romische 150.  
<sup>3</sup> S.K.G., ii, 243; O.R.L., Str. i,

for some time a fine natural frontier, a broad ridge giving wide views over the lowlands to the east; south of Schlossau, where the hills fall away, giving place to a low plateau, the limes is drawn dead straight, the earliest example of a type of frontier ordinarily ascribed to Hadrian and so unlike Domitian's usual frontier that its dating has been questioned.<sup>1</sup> At Wimpfen the Neckar itself becomes the frontier.

At the beginning of Domitian's reign the fortress of Strasbourg, which had been empty, except for possible detachments, since the departure of the Second Legion to Britain in 43, was reoccupied by Leg. VIII Augusta from Gaul, so that for the southern sector the Mainz command had additional support.<sup>2</sup> The Kinzig road linked this legion with the Neckar and thus with the frontiers of Germany and Raetia, and the fine Rhine-valley roads facilitated communication with all parts of the territory to the north and north-east. The fort of Vindonissa has only a temporary importance, for although its garrison had played its part in the advances down the Neckar valley and into the trans-Danubian country, it was abandoned by Trajan.<sup>3</sup> It was no longer needed to watch Gaul, and growing pressure in the Danube lands demanded attention.

### Forts

The usual Domitianic permanent frontier fort, like the Saalburg, which presumably housed a detachment from the nearest cohort, was of earth and averaged five acres, being very much the size of the later numerus fort. The baths of these forts were the only stone buildings on the early limes.<sup>4</sup> Besides these, along the limes of Domitian are small, often very irregularly shaped, earth camps, without any stone

<sup>1</sup> O.R.L., Str. x, 13-14; cf. Stadel op. cit., II, who questions whether this line is really Domitian's.

<sup>2</sup> E. Clotz, *Ger.*, vii, 1923, 43; R. Syme, 'Rhine and Danube Legions under Domitian,' *Journ. of Rom. Studies*, xviii, 1928, 41-42; A. Grenier, *Manuel d'archéologie gallo-romaine*, i, 1931, 236 ff.

<sup>3</sup> R. Laur-Belart, 'Vindonissa, Lager und Vicus,' 1935, 8.

<sup>4</sup> G.R., i, Plates xii (Saalburg), xvi (Kapersburg, Würzburg). The small fort of Heidekringen, guarding an important road immediately north of Wiesbaden, also deserves notice. It was evidently erected to provide extra security for Wiesbaden (*Limesblatt*, 809 f.; O.R.L., 31, 69).

buildings or baths, presumably first used by the working parties laying out the frontier and building the watch towers, and occasionally (as at Kemel) retained as convenient for guarding important points and for housing squads supplying the patrols to the neighbouring towers. Two of these early camps lie close to the later Saalburg fort.<sup>1</sup>

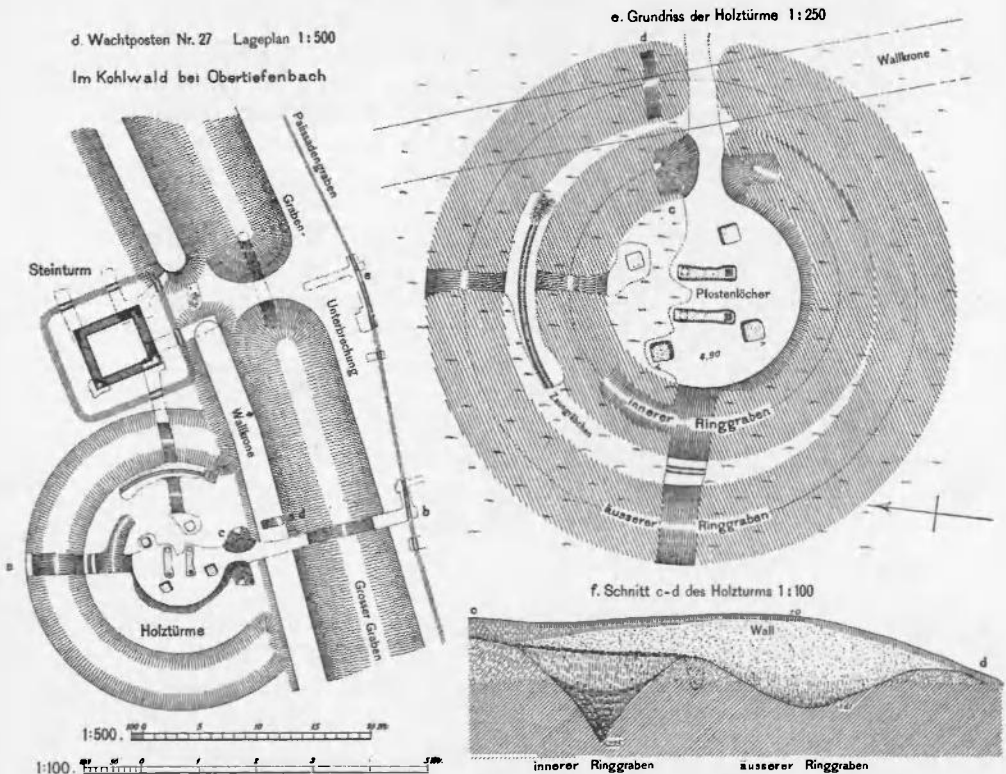


FIG. 1. SIGNAL STATION ON STRETCH II  
(O.R.L., Str. ii, Pl. vii)

### Wooden Towers<sup>2</sup>

The outward sign remaining of a wooden signal tower is generally a slight mound. The tower was, except on very steep points, surrounded by a ditch,

<sup>1</sup> A number of such camps are described in *Arch. Anz.*, 1900, 86 ff. and *W.Z.*, xiv, Plate 12. See also *O.R.L.*, Str. iii, 40 f.

<sup>2</sup> *O.R.L.* All stretches except vii-ix, and xi.

generally circular, sometimes square, probably for drainage purposes. Within the ditch four postholes show the positions of the stout squared logs (about one foot thick, and planted six or seven feet deep) which held the framework of the structure and bore

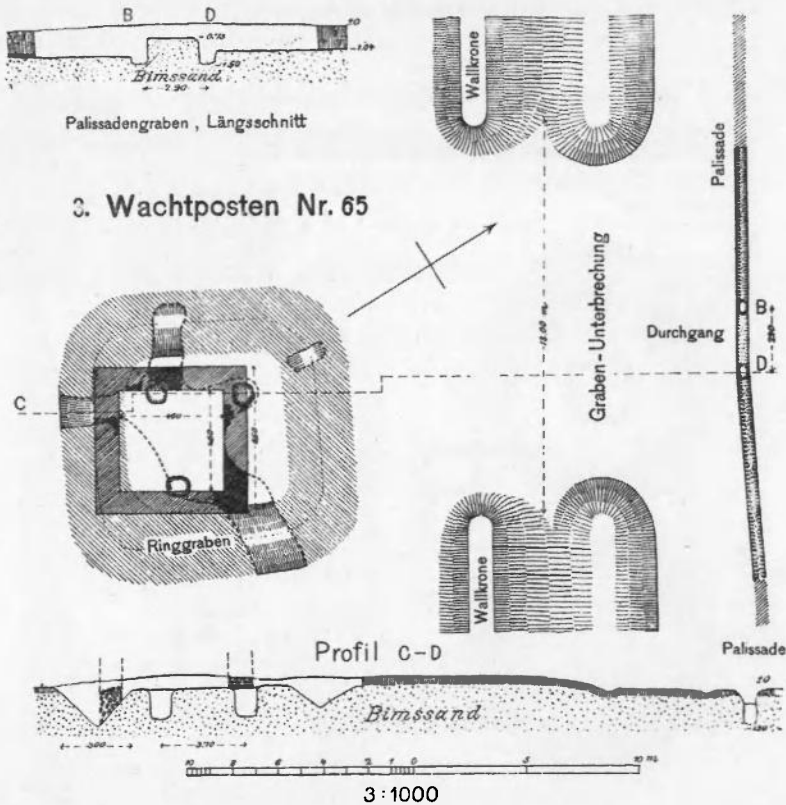


FIG. 2. SIGNAL STATION ON STRETCH I  
(O.R.L., Str. i, Pl. xviii)

its main weight. Judging from the strength of these posts, and from the representations on the columns of Trajan and Marcus Aurelius, the towers must have generally been two-storeyed, and, from a calculation of signalling needs, must have been from fifteen to eighteen feet in height. From the Lahn southwards to the Aar (Stretch ii) there are two groups of wooden

towers (Fig. 1) ; the earliest are small (7 ft. by 9 ft.),<sup>1</sup> and were burnt down, probably during the rebellion of Saturninus. They were replaced by larger towers (13 ft. by 15 ft.) and similar ones were built on the

## 2. Wachtposten Nr. 8

b. Grundriss und Profil 1:500

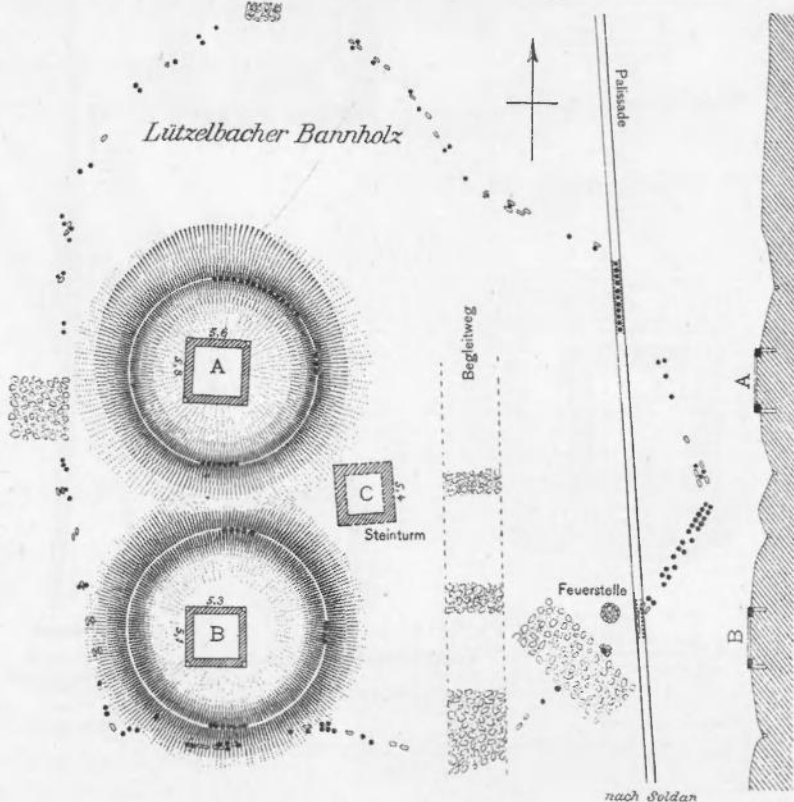


FIG. 3. SIGNAL STATION IN THE ODENWALD  
(O.R.L., Str. x, Pl. iii)

stretch from Ems to the Rhine, on which none of the smaller towers have been found (Fig. 2). In a few cases signs of a palisade immediately inside the circle of the ditch have been discovered. Fig. 1 shows a

<sup>1</sup> Cf. Flavian watchtowers in Caledonia, Collingwood, *op. cit.* 58 ; small towers also occur on Stretches iii and iv (O.R.L., Str. iii. 24, 45).



small tower, on the site of which a larger one, with a new, shallower, ditch, and a palisade, was erected. Many of the wooden towers on all stretches were built over by later stone ones, probably because of the desire to retain a good position (Fig. 2) ; the remains of others are cut across by, or even lie in front of, the Pfahlgraben or the Raetian Wall.<sup>1</sup>

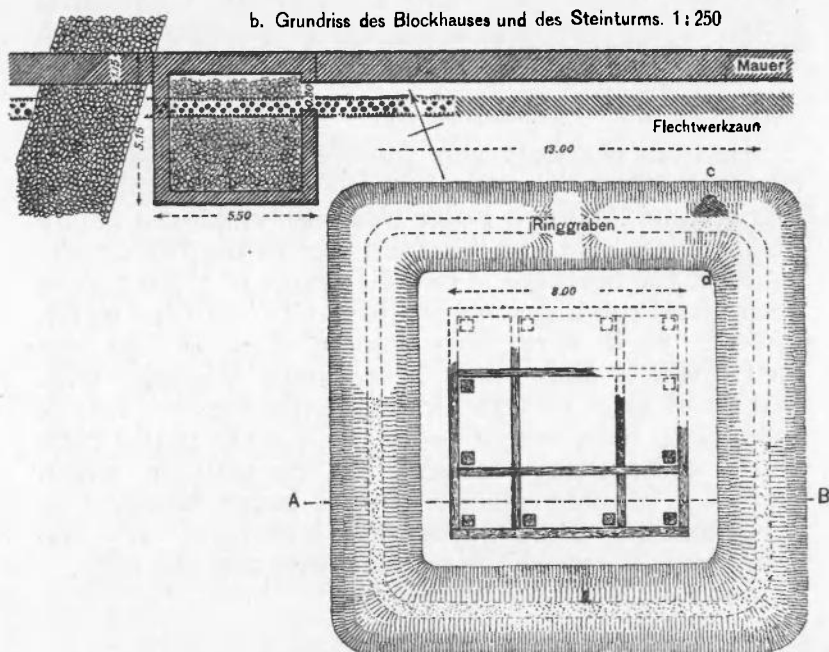


FIG. 4. SIGNAL STATION EAST OF GUNZENHAUSEN  
(O.R.L., Str. xiv, Pl. 6, signal station 15)

In the Odenwald the foundations of the wooden towers were reinforced with a dry framework of the good stone that is so plentiful in the district (Fig. 3).<sup>2</sup> In two cases additional protection was given by a palisade running round the bottom of the ditch (Fig. 3).

In Raetia most data come from the Bavarian stretches ; up to the present few wooden towers have

<sup>1</sup> *Limesblatt*, 629-30 ; *P-W.*, xiii, 609 ; *O.R.L.*, Str. xiv, Pl. 7.

<sup>2</sup> Similar foundations are known in the Taunus, *O.R.L.*, Str. iii, 22.

been found on the Württemberg stretch. The towers (mostly twelve to thirteen feet square) are generally surrounded by a ditch roughly square in plan, crossed by a wooden bridge, and with a palisade of stout stakes round the bottom. On stretch 14 in three cases more elaborate wooden blockhouses were found, with sides twenty-one or twenty-four feet long and a series of postholes instead of the usual four. The vertical posts were bound together by a framework of horizontal beams; here also a palisade was planted in the ditch (Fig. 4).

*The Wetterau 'Flechtwerkzaun'*<sup>1</sup>

Hadrian generally gets the credit for devising the continuous barrier, but there are indications that in places some kind of a hedge had been employed before his day. On that very exposed part of the Domitianic frontier, the northern Wetterau, traces of a ditch have been found running some 100 feet in front of the watch towers. In it were posts planted three to four feet apart, which must have been bound together with withies of some sort to form a wattle hedge. This is thought to have been a protection for the patrol path and is quite clearly earlier than the palisade, which crossed it in many places. Such a hedge, however, is exceptional. The important structures of the Domitianic limes are the watch towers and the forts.

TRAJAN

Trajan, as legate of Upper Germany under Nerva, and as emperor, proceeded with the work already undertaken by Domitian; and consolidated the system that emperor had called into being. It is not always possible to say whether a fort, still less a road, belongs to the end of Domitian's reign or to the early part of Trajan's. A milestone of A.D. 100 at Bühl recalls Trajan's reputation as a road-builder,<sup>2</sup> and the advance to the line Cannstatt—Lorch—Aalen, whereby the

<sup>1</sup> Fabricius, *P.-W.*, xiii, 601; *Arch. Anz.*, 1899, 85 ff.; *Limesblatt*, 619 ff.

<sup>2</sup> *C.I.L.* xiii, 9120; Aurel, *Vict.*

*Caes.*, xiii, 3: *iter conditum per feras gentes quo facile ab usque Pontico mari in Galliam permeatur.*

Rems became for a time the frontier, may be ascribed to the first quarter of the second century, and thus possibly to Trajan.<sup>1</sup>

#### HADRIAN

During the reign of Hadrian comes the first important change. This emperor was responsible in Germany, as in Britain, for the erection of a continuous barrier, which in Germany took the form of a stout palisade and followed, with a few exceptions (of which the chief is the notably straight sector east of the Wetterau), the frontier line of Domitian. Where Hadrian's frontier coincided with Domitian's the old signal towers were retained; elsewhere new ones were built. That wooden towers were still erected under Hadrian is proved by the fact that they occur on the new East Wetterau frontier.<sup>2</sup> The palisade line in Raetia zigzags gently in a succession of short, straight stretches ( $1\frac{1}{2}$ , 9 and  $10\frac{1}{4}$  miles are representative lengths); the lie of the land is therefore not lost sight of in the desire to shorten distances.<sup>3</sup> In western Raetia certain minor advances were made when laying out the palisade.<sup>4</sup> Hadrian is also probably responsible for the wide bend to the north beyond Weiltingen, to bring within the empire the commanding height known as the Hesselberg, and a fresh tract of fertile *lias* land.<sup>5</sup>

Hadrian discontinued Domitian's excellent scheme of three lines of defence in Upper Germany by moving his cohorts forward to the limes itself from many of the forts to the rear, which he abandoned. So forts like the early Saalburg one were rebuilt to hold the larger units.<sup>6</sup> Under Hadrian also the Numeri, auxiliary troops of inferior class, appear on the limes, and have to be provided with forts. These are some-

<sup>1</sup> *O.R.L.*, Str. xii. 24 (cf. *R.W.*, i, 99, and *P.W.*, xiii, 609).

<sup>2</sup> *S.W.*, 16.

<sup>3</sup> *O.R.L.*, Str. xiv, 15-16.

<sup>4</sup> *O.R.L.*, Str. xii, 22 ff.

<sup>5</sup> *O.R.L.*, Str. xiii, 8; xiv. 12; cf. vii-ix, 13.

<sup>6</sup> *Ber.*, xi, 52 ff. The Saalburg is not yet published in the Kommission's series, but in Jacobi, *Das Romerkastell Saalburg*, 1897, and the *Saalburg-jahrbucher*. Cf. also *Saalburg Führer* for summary of its history.

times new (Feldberg) or built over Domitianic earth forts (Kapersburg). The road from fort to fort along or near the frontier now becomes all important, whereas hitherto the roads to the frontier from the cohort forts had been of greater significance. From the military point of view this abandonment of the old dispositions is open to serious criticism; the only support in the rear was now the legion; yet when Hadrian carried out his changes the empire was enjoying profound peace and it seemed unlikely that anything more than a frontier police was necessary in Germany.

### *The Palisade*<sup>1</sup>

A narrow, steep-sided ditch (Figs. 1, 2 and 3), into which the posts were originally set, long puzzled archaeologists, until in 1883 its nature was recognised by Soldan, who found postholes in it on the East Wetterau stretch. Postholes can still be detected on all stretches while, in a few places, notably in certain swampy tracts in Bavaria, the actual stumps of massive oaken logs have been found (Plate 1a). The statement in the *Historia Augusta* that Hadrian erected palisades in many places where there was no river frontier, has thus been strikingly borne out.<sup>2</sup> The ditch was three or four feet deep on an average, but the depth varied very much with the nature of the ground. In addition to the carbonised remains of posts numerous stones have been found in the ditch (though not throughout its length) and also iron nails. The posts, usually of oak, sometimes of pine, were about a foot thick, and were generally trunks of young trees sawn in half down the middle. They were set in the ditch and horizontal beams were nailed to them near the bottom; stones were set in as wedges and then the ditch was filled in with its own earth and any rubbish that came handy, so that in the neighbourhood of watch towers a good deal of miscellaneous potsherds got mixed in with the filling. The palisade is thought to have been about

<sup>1</sup> O.R.L., all stretches except vi and xi.

<sup>2</sup> *Vit. Hadr. 12. In plurimis locis, in quibus barbari non fluminibus sed*

*limitibus dividuntur, stipitibus magnis in modum muralis seapis funditus iactis atque conexis barbaros separavit.*



A. PALISADE STUMPS NEAR THE  
WÜRTTEMBERG-BAVARIAN BORDER  
(*O.R.L.*, Str. xiii, Pl. xi, 1)

To face page 18.

PLATE I.



B. PILE FOUNDATION OF RAETIAN  
WALL IN MARSH NEAR DAMBACH  
(*O.R.L.*, Str. xiii, Pl. xii, 5)





A. STONE WATCH TOWER ON STRETCH VIII  
(*O.R.L.*, Str. vii-ix, Pl. xx, 1)



B. PFAHLGRABEN NORTH OF MAINHARDT, LOOKING NORTH  
(*O.R.L.*, Str. vii-ix, Pl. xx, 5)

nine feet in height (Spartianus refers to great stakes 'in the manner of a wall') and its appearance can be judged from the column of Marcus Aurelius, where a frontier palisade, possibly that of Raetia, is shown. On the difficult rocky hill between Zwing and Seitzenbuche in the Odenwald a stone wall (between three and four feet broad, built without any clay or mortar binding) was substituted for the palisade. The palisade ditch can be seen without excavation in certain places in Raetia, and it is suggested that the palisade may there have stood in a depression, like the palisades round the wooden towers.<sup>1</sup>

#### THE MID-SECOND CENTURY

There are certain limes works now to be considered which cannot be exactly dated, but which must belong to some period in the second century.

##### *The Raetian 'Flechtwerkzaun' and the 'Bretterzaun'*

Variants of the palisade have been found on the Bavarian stretches of the Raetian limes. The 'Flechtwerkzaun' or wattle hedge evidently consisted of thin wooden uprights planted in the ground about eighteen inches from each other either way, with numerous twigs or rods thickly interwoven, so that a tough artificial hedge resulted (Fig. 4).<sup>2</sup> The 'Bretterzaun' was stockading of planks four to six inches thick, wedged in on both sides at their base by stones close together.<sup>3</sup>

The only thing that can be said of these Raetian fences is that they served as substitutes for the palisade, to which they were subsequent, as their relative position in a number of places shows. The palisade must have rotted in due course, a process hastened by the lime in the soil, so that a decision may have been taken to set up a new kind of barrier which would be more readily repairable. Where both occur the 'Bretterzaun' is in front of the 'Flechtwerkzaun,' but

<sup>1</sup> O.R.L., Str. xv, 16; cf. Arch. Anz., 1899, 80.

<sup>2</sup> O.R.L., Str. xiii, 13 f.; xiv, 24 ff.; xv, 17.

<sup>3</sup> O.R.L., Str. xiv, 24 ff.

their relative date has not been established. The former might also be connected with special defence measures in the Altmühl valley.

*The Replacement of Wooden Towers by Stone Towers*

The wooden towers seem gradually to have been replaced by stone ones, but the change cannot, in most cases, be dated. It is known to have gone on in the Odenwald early in the reign of Antoninus Pius, but the possibility cannot be excluded that it may have begun earlier on other stretches.

*The Stone Towers*<sup>1</sup> (Pl. ii A and Figs. 1-4)

The dimensions of the stone towers vary : on the northern stretches all but a few hexagonal ones are rectangular, with sides varying from ten to twenty-five feet (average 13 ft.). Lime mortar was used in nearly all to hold the rough hewn masonry of the foundations (about 3 ft. thick) together, which would give them the strength necessary to bear a second storey. Round the second storey there probably generally ran a wooden balcony (*cf.* Trajan's column). The foundations of two or more stone towers are often found together ; there is considerable variety in construction, and indications generally point to the second of two nearby towers having been built when the first had fallen into disrepair.

The stone towers in the Odenwald are specially well built, presenting many features not found on other stretches. They, and most other stone buildings on the stretch, show a striking uniformity of technique, which is in part due to the good sandstone employed ; between stations 33 and 34 a Roman quarry in this is known. Great care was bestowed on the stone work ; the foundations reach at times a depth of three feet ; in some towers there are two or more offsets, and fragments of moulding found by the ruins suggest decoration ; it is thought that the walls were lime-washed and the stones pointed with red ; floors were flagged. Pieces of sandstone thresholds have been

<sup>1</sup> O.R.L., all stretches, except xi.

discovered, some with pivot holes for the door hinges and, in one case, a fragment of a lintel turned up. None of these was in place, but there is enough of the towers intact to show that the doors were evidently high up and must have been reached by wooden steps or ladders. Window-sills and semicircular lunettes provide evidence of small windows. Dwarf pillars have also been found, which must have supported the balcony roof of the upper storey. The galleries on this stretch were thus presumably stone ones. Inscriptions found at four of the stations inform us that they were built by Numeri of Brittones in the eighth year of Antoninus Pius.<sup>1</sup>

Many of the stone towers of the outer German limes, while not sharing the architectural embellishments of the Odenwald line, have ditches round them, in which are palisades (*cf.* Trajan's and the Antonine columns). In Raetia the greatest number of the stone towers are pre-wall, and the wall was built on to them; a few, however, are keyed into the wall, and others were even built subsequently to it.

Near some of the towers small stone buildings (average 24 ft. by 21 ft.) have been found; whether they housed men, beasts or supplies is not known.

#### SIGNAL-STATIONS IN GENERAL

It has been calculated that along the Upper German and Raetian limes there must have been about a thousand signal stations. They were laid out along the Main as well as along the artificial frontier,

<sup>1</sup> These Brittones which appear on the Limes by 145 are believed to be transported inhabitants from the British territory reconquered by Lollius Urbicus in 142. They were settled in various parts of Germany, especially along the rather lonely eastern plateau of the Odenwald, and different groups seem to have been given names adapted from those of neighbouring streams, e.g. Nemaningenses on the Mümling (Nemaningia), Elantienses on the Elz (Alantia), Murrenses on the Murr. Their buildings are quite distinct

from any others on the German limes, with a considerable amount of decoration which is very similar to that found on the distance slabs of the Antonine Wall. Fabricius, *O.R.L.*, Str. x, 34-36, and Str. vii-ix, 51-54; Drexel, 'Bauten und Denkmäler der Brittonen am Limes,' *Ger.*, vi, 1922, 31 ff. G. Macdonald, *The Roman Wall in Scotland*, 2nd edn., 1934, 49. For other Brittones, *cf.* *Saalburg-jahrbuch*, iii, 1912, 18-19, 21, Plate v, 40, and Stade, *op. cit.* (above, p. 3, note 1), 18—Brittones on the outer limes.

although, owing to the long-established cultivation and the periodical flooding of the river valley, they are now very rarely found. Four, however, have been located in the neighbourhood of Obernburg, and they evidently lay as close together here as on other stretches.<sup>1</sup>

Fabricius has noted the following as the chief considerations determining the lay-out of watch towers: (1) No good high point remains unoccupied; the aim was, where possible, to overlook the limes itself, the region outside, the region inside, and to be able to signal a considerable distance. (2) A point where the limes changes its direction generally has a watch tower; this is specially noticeable on the northern stretches. (3) Limes crossings are guarded; a good example is the opening shown in Fig. 2.<sup>2</sup>

In addition to occupying high points from which the country could be watched and signals could be sent, these towers obviously served the purpose of resting-places for the patrols, perhaps for days at a time, for pottery, hearths and even millstones have been found in their ruins. The stone ammunition balls found in the Odenwald towers suggest that they could be used for defence also.

The Trajan and Marcus columns bear witness to the use of fire-signals, for they both show stone towers two storeys in height with balconies, across which great torches project. Near to some are stacks of wood and straw, perhaps for use as beacons. It is believed that evidence for these beacons, though of a late date, has been discovered, for by three watch towers on the stretch between Rhine and Lahn, single stone-packed postholes have been found in the earth rampart. Each may very well have held a wooden post round which a straw stack could be built up, as can be seen in many places on the continent to-day. In one case the ground round the posthole showed signs of heavy burning.<sup>3</sup>

There is a legend coming from Stretch 7 of a fiery

<sup>1</sup> *O.R.L.*, Str. vi, 8-9.

<sup>2</sup> Cf. below, p. 38.

<sup>3</sup> *O.R.L.*, Str. i, 54. The question of Roman signalling is discussed by

Macdonald, *op. cit.*, 354 ff., who reproduces the signal-tower scenes from the columns of Trajan and Marcus (Plates iv and lx).

ball that used to roll along the Pfahl; in the same district and in the Odenwald other legends tell of giants who lived in the watch-towers and tossed hammers to and fro from tower to tower.<sup>1</sup> It would be interesting if one could believe that these tales represent some memory of the old functions of the towers and their garrisons.

The distance between watch-towers varies from as little as 300 yards to nearly 1,000 yards, but the latter cases may simply mean that intervening posts have not been found. The former is due to special difficulties of terrain. The average distance is about 650 yards. In some districts at least the stone towers were known as *burgi*, evidence coming from an inscription on one of the Odenwald towers, though a passage in Vegetius makes it unlikely that the term was confined to towers of this type<sup>2</sup>.

#### ANTONINUS PIUS

The Roman frontier in Germany was advanced for the last time towards the end of the reign of Antoninus Pius, when a new palisade was erected between Miltenberg and Haghof to take within the empire the good cultivable land which lay east of the Odenwald and across the Neckar. Along this line all the watch-towers were of stone. The southern part of the new frontier touched the western fringe of the inhospitable Franconian keuper sandstone, where the great pine forests began. The Roman frontier across the Neckar and in Raetia, it should be noted, follows remarkably closely the boundary between lias and keuper.<sup>3</sup> Thus,

<sup>1</sup> O.R.L., Str. vii-ix, 18; Str. x, 99.

<sup>2</sup> O.R.L., Str. x, 85 (C.I.L., xiii, 6509): *I.O.M. vexil(latio) coh(ortis) I Sequanorum et Raur(icorum) eq(uitate) sub cur(a) Antoni(i) Natalis (centurionis) leg(ionis) xxii p(rimigeniae) p(iae) f(idelis) ob burg(um) explic(itum) v.s.l.l.m.* Cf. O.R.L., Str. i, 42; C.I.L., iii, (3385); Art. *Burgus* in *Thes. Ling. Lat.*; Seeck, Art. *Burgus* in Pauly-Wissowa, and Vegetius, iv, 10: *castellum parvulum quem burgum vocant*; Behrens, *Germ.*, xv, 1931, 81.

<sup>3</sup> O.R.L., Str. vii-ix, 13 (cf. above, p. 17). It is permissible, especially in view of the strengthening of the Rems line, to wonder whether the Danubian wars of the sixties did not in some measure cast their shadow before, but the statement of E. E. Bryant ('The Reign of Antoninus Pius,' *Camb. Hist. Essays*, 1895, 52) that 'the whole of the northern frontier was in a dangerous and threatening condition' during this reign, seems too strong for the single passage in the *Vit. Pii* 5, *et Germanos et Dacos et*



while Domitian was governed mainly by strategic considerations in drawing his frontier, subsequent emperors seem to have been more deeply concerned with bringing good cultivable land within the empire. The corner by the Rems, however, is an exception to this; the sector between Haghof and Lorch follows a ridge and is laid out quite in the earlier tradition. This sector was set up about 145 (about the time the Odenwald stone towers were being erected), and the fort Welzheim-Ost, with its surprising situation outside the final limes and its garrison of Brittones, seems to have been part of the system, which may have been intended to continue north-westwards to the Neckar. A few years later the Raetian limes was advanced to the outer side of the ridge north of the Rems, and a palisade constructed, and at the same time the long, straight stretch was taken in hand.<sup>1</sup>

The advance to the line Miltenberg-Haghof cannot be exactly dated, but must have come some time in the fifties, and the cohorts were moved forward to forts on the outer limes corresponding to the positions they had occupied on the inner line.<sup>2</sup> The most striking feature of the whole German limes is the remarkable straight stretch of fifty miles between Walldürn and Haghof which was now laid out (Pl. iii).<sup>3</sup> An eighteen-mile section of this has been carefully

*multas gentes contudit per praesides ac legatos*, without any archaeological confirmation except the one inscription, *C.I.L.*, vi, 1208, *Germanos Maurosque domas sub Marte Guitanos Antonine tua diceris arte Pius*, especially in view of the fact that large numbers of troops were withdrawn from the northern frontier for the Parthian War of the beginning of the next reign (*C.I.L.*, ix, 2457). It is preferable, therefore, to regard the new Antonine line in Germany as reflecting a desire for good land rather than as a precautionary measure. An interesting German settlement recently discovered at Baldesheim, forty miles south-east of Miltenberg, shows peaceful intercourse with the Romans at this period (*Ger.*, xv, 1931, 83 ff.). Fabricius (*Forsch. u. Fort.*, vii, 1931, 277 ff.

*cf.* Macdonald, *Roman Wall in Scotland*, 2nd edition, 49 n.) suggests that one reason for the extension of this frontier may have been the need for more land for the recently transplanted Brittones, while to keep an eye on the new settlers, who may have been restless (see *O.R.L.*, Str. x, 36), the watch-towers on the new line were set much more closely together than on other sections of the limes (average distance, 450 yds., as against 650 yds. for the limes as a whole).

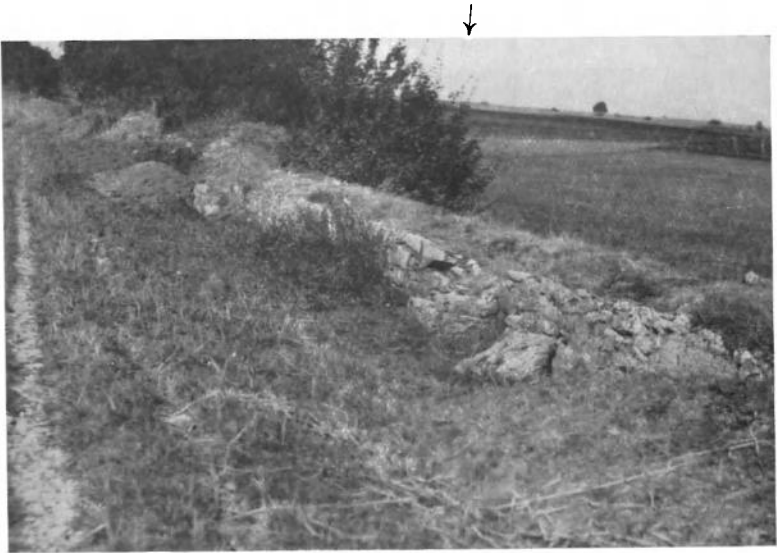
<sup>1</sup> *O.R.L.*, Str. xii, 23 ff (also *R.W.*, i, 112 ff.; *O.R.L.*, Str. vii-ix, 43, 56, 191).

<sup>2</sup> See p. 36 below.

<sup>3</sup> There is only one break—a detour (north of Mainhardt) of a little over a mile to avoid a deep gully (*O.R.L.*, Str. vii-ix, 156).



THE UPPER GERMAN LIMES : AIR-PHOTOGRAPH, LOOKING NORTH TOWARDS WELZHEIM  
(By permission of Messrs. A. Weber & Co., Stuttgart)



A. THE RAETIAN WALL ON STRETCH XIV, NEAR ELLINGEN  
(The arrow indicates the remains of a buttress)



B. FOUNDATIONS OF THE WALL AT THE SULZACH, WITH  
GAPS TO LET FLOODWATER THROUGH  
(*O.R.L.*, Str. xiii, Pl. xii, 4)

surveyed and found only to deviate one yard from the true reckoning, which shows the accuracy of which the Roman surveyors were capable. A number of theories have been advanced as to how the original measurements were carried out. The line from Miltenberg follows the watershed between two little streams, the Mud and the Erf, to the neighbourhood of Walldürn, and Hertlein put forward the view that the long, straight stretch was measured from the south on to Walldürn, for a beacon lit at night on the hill between Walldürn and Rinsheim would be visible from the neighbourhood of Lorch.<sup>1</sup> He pointed out that the southern part of the stretch runs along the west side of the Lein valley, which must have also been an important factor in determining its direction. Fabricius disagrees with the view that the whole measurement was done from south to north; he believes that a point about midway was chosen, and then a number of intermediate points taken.<sup>2</sup> Then by signalling and sighting, still other points were established, and finally the palisades could be constructed. He fixed on the six-sided tower at Signal Station 51 (north of Mainhardt) as his cardinal point. Paret has recently once more examined the problem, studying the map and the ground to see which of the watch-towers really lie on natural vantage points rather than on points determined by the line of the limes.<sup>3</sup> Station 116 (South of Murrhardt) is at once noticeable as the highest point of the whole line, and on it, Paret observes, was built the largest tower, with sides of over 18 feet. This provides a commanding view of the country to north and south, and looking northward through a break in some low hills a distant hilltop is just visible. The fact that another tower

<sup>1</sup> *R.W.*, i, 109 ff.

<sup>2</sup> *O.R.L.*, Str. vii-ix, 33 ff.

<sup>3</sup> Paret, 'Die Absteckung der geraden Limesstrecke Walldürn-Haghof,' *Ger.*, xvii, 1933, 263-6. Paret touches on a further problem, namely, the possibility of an earlier limes north-west from Lorch, taking in Welzheim and perhaps running to

Murrhardt. A few of the watch-towers south of Welzheim lie unusually far behind the Pfahlgraben, and thus might have belonged to a previous system, and there are one or two small Roman buildings in the hinterland, hitherto unexplained, which might be watch-towers. No certainty as to such a line has yet been reached.

(83) stands on this can hardly be due to chance, and Paret believes that it must be a secondary point in the system, assuming 116 to be the chief point of departure. The position of the hexagonal tower is not visible from either 116 or 83. A careful search for postholes belonging to wooden towers was made along this frontier. No sign of wooden towers was found north of Walldürn. On the long, straight stretch, however, traces of postholes do occur by, and evidently anterior to, some of the stone towers. In no case, however, do these structures seem to have been specially strong, nor do traces of occupation corresponding to a wooden tower period occur. Fabricius thinks that these postholes represent temporary platforms used by the surveyors in the difficult work of laying out this stretch.<sup>1</sup>

#### INTERVAL FORTS AND FIELD POSTS

(‘Zwischenkastelle’ and ‘Feldwachen’<sup>2</sup>)

At intervals along the limes, between the regular garrison stations, occur small forts (called *Zwischenkastelle* by German archaeologists), most of which cannot be dated closely. A number of them are earth forts replaced in due course by stone forts; elsewhere we have small stone forts with, apparently, no earth predecessors. They fall into two groups. The larger consists of forts ranging in size from about  $\frac{1}{4}$  acre (1,210 sq. yds.) to  $\frac{3}{4}$  acre, and must be distinguished from the smallest of the numerus forts, which are all over  $1\frac{1}{4}$  acres in area. The forts of the second group rarely exceed 700 sq. yds. in extent, and may be as small as 240 sq. yds. They are called *Feldwachen*, and recall the British milecastles.

The fort at Rheinbrohl guarding the northern *caput limitis* is 840 sq. yds. in area, thus falling into neither category. It was specially strongly built, however, and seems to have been a late rebuilding of a larger fort. There are several small forts between

<sup>1</sup> O.R.L., Str. vii-ix, 20 ff.

<sup>2</sup> O.R.L. All stretches except xi.

The dimensions given in this paper for forts are inside measurements.

Rhine and Lahn, all lying at important points. The Lahn-Aar stretch again has five, among which the second Kemel earth fort should be included. It held a century, whose quarters of the regular type have been found. The High Taunus probably had seven.

On the Odenwald stretch are five small forts which belong to the same period as the stone watch-towers, with similar careful finish and lavish decoration. At Trienz, the largest of the series (2,368 sq. yds.), was a building inscription set up by the Brittones Elantienses under Antoninus Pius.<sup>1</sup> The others are smaller (generally about 480 sq. yds.), one being only 203 sq. yds., and thus fall into the 'fortlet' or *Feldwache* group. The outer German limes north of Haghof has so far yielded four *Zwischenkastelle*. They are unusual, for all but one have no ditch. There are also a few *Feldwachen*, which seem to be confined to the southern part of the line, and possibly to occur after every fifth or sixth station. On the Raetian section in Württemberg the small fort at Freimühle has a bath alongside and one of the *Feldwachen* (168 sq. yds.) was found joined to the limes wall, thus reminiscent of a milecastle, but without a gateway through the wall itself.<sup>2</sup> In Bavaria, especially between Gunzenhausen and Kipfenberg, more of the *Feldwachen* were found, lying a few yards behind the wall. It is possible that they were built at regular intervals of about 2.9 miles, with six or seven watch-towers between them.<sup>3</sup> They measure 470 sq. yds., closely corresponding to the British 'mile-castles' (about 500 sq. yds. on an average). Fig. 6 shows one of them, with sides sixty-five feet long, wall two feet thick, corners not rounded, a single gateway and, like the milecastles, no ditch. Some, however, have two entrances. The corresponding posts on the Odenwald line have rounded corners. It will be noticed that the *Feldwachen* are found much more commonly on the southern stretches of the Upper German limes

<sup>1</sup> C.I.L., xiii, 6498.

<sup>2</sup> O.R.L., Str. xii, 44 (Freimühle), 78 (Dalkingen).

<sup>3</sup> O.R.L., Str. xiv, 38. This figure

needs further testing, for on Stretch xv (p. 23), where only three have up to the present been found, two are only  $1\frac{1}{2}$  miles apart.



and in Raetia, than north of the Main, and that the later examples are more regular in size and measurements than the earlier ones, belonging to the period when the frontier system was fully developed, and possibly influenced by that of Britain. On the Rhine-Lahn stretch a few of the *Zwischenkastelle* (e.g. Anhausen and Hillschied) seem to have been reduced in their last period to the size of *Feldwachen*, though even in the final phase they were still provided with a ditch.

No fort corresponding to the one at Rheinbrohl has yet been found at the point where the limes reaches the Danube, despite prolonged search, and despite the fact that the nearest fort, at Eining, is two-and-a-half miles upstream and on the right bank. This stretch has no numerous fort, except Böhming on the Altmühl, and no *Zwischenkastelle*. It is possible that there are none to be found, except some further *Feldwachen*, because this stretch cannot have been very liable to frontier incursions. The Altmühl gorge and the 'Donaudurchbruch' below Eining render it peculiarly unsuitable for attack. The main approaches, whether of peaceful or warlike traffic, would lie to the east of Kelheim or the west of Böhming.

#### MARCUS AURELIUS AND LATER EMPERORS

Under Marcus Aurelius a series of frontier inroads, culminating in the Marcomannic War, disturbed the peace of the northern provinces. The first-comers were certain south-western tribes, who burst into Germany and Raetia in 162.<sup>1</sup> New legions had to be raised to augment the imperial forces, and at the close of the wars one of these, the Leg. III Italica, was assigned permanently to Regensburg.<sup>2</sup> The successors of Marcus maintained an uneasy peace along these borders, and considerable activity was shown under Commodus in repairing forts which had suffered during

<sup>1</sup> *Vit. M. Aurel*, 8.

<sup>2</sup> *P.-W.*, xii, 1533.

the wars.<sup>1</sup> Under Septimius Severus extensive repairs of the roads were undertaken.<sup>2</sup>

Caracalla was called north in 213 to face a new and redoubtable enemy, the Alemanni, who were doubly dangerous as a nation of horsemen. He drove them out and started with energy all manner of repairs and new buildings.<sup>3</sup> The great earth wall and ditch of Upper Germany and the stone wall of Raetia cannot yet be dated with absolute certainty, but many indications point to Caracalla as their author. The whole system implies some new and urgent peril, and it would prove of undoubted use in delaying mounted raiders. Both walls would be formidable barriers, whereas the palisade could be rapidly hewn down and a raiding party could sweep through and away before enough Roman troops came up to dispute their passage. It will occur to students of the British Wall that Caracalla was with his father in Britain in 209-211, and that he must have been thoroughly familiar with the British frontier system; it is therefore perhaps not altogether fanciful to suggest that the new German wall may have owed something to the inspiration of Hadrian's Wall.<sup>4</sup> Unfortunately, however good his intentions, Caracalla, as Dr. Stade has shown, lacked a real grasp of the necessities of the situation.<sup>5</sup> He could construct a bigger and better barrier, but he failed to restore the system of cohort forts in the rear which had been such an admirable feature of Domitian's organisation. It should be added that the development of the Pfahl may have already begun under Septimius Severus himself. No distance slabs, such as those of the Antonine Wall, have been found to throw light on the problem of dating. The finds of pottery, etc., along the Pfahlgraben, made by early

<sup>1</sup> *E.g.* C.I.L., xiii, 6578 (Osterburken: *a solo fecit*); C.I.L., iii, 11933 (Pfünz) and 14370<sup>2</sup> (Bohming). A new fort in the Neuwied Basin was built at Niederbieber (*B.J.*, cxx, 1911, 275; *G.R.*, i, Taf. xv).

<sup>2</sup> His league stones are frequent in Gaul and Germany (*cf.* C.I.L., xiii, 9088, 9137; iii, 5987).

<sup>3</sup> *Aurel. Vict. Caes.*, xxi, 2; *Dio*, 77.13.4; *Vit. Car.*, 5 and 10; C.I.L.,

vi, 2086 (Arval Bros.) Aug. 213: *per limitem Raetiae ad hostes extirpandos barbarorum (terram) introiturus est, ut ea res ei prospere felicitique cedat.* C.I.L., xiii: 6301, 7465, 8201, 9068, 9072.

<sup>4</sup> R. G. Collingwood, 'The British Frontier in the Age of Severus.' *J.R.S.*, xiii, 1923, 69-81.

<sup>5</sup> Stade, *Rom. Limes in Baden*, 19-20.

investigators, are generally inadequately recorded. Those finds whose position is exactly known, point to a date early in the third century. Near the Saalburg a coin of 194 was found deep in the mound, and not far away pottery of the early third century was found buried in the side of the ditch.<sup>1</sup>

*The Earth Wall and Ditch (Pfahlgraben)*<sup>2</sup> (Pls. ii B and iii, and Figs. 1, 2 and 5)

The Pfahlgraben still runs across the country for long stretches, best preserved in the woods and tending to disappear where it crosses cultivated land. Sometimes it is found to correspond to present day field or village boundaries, but this need not be significant in any way—at any period it would be tempting to make use of an already-existing and convenient landmark.

Where there is least disturbance the ditch is nineteen to twenty-five feet wide and six or seven feet deep. The total width of the work at present is about sixty-three feet, of which about thirty-eight are the rampart. The latter was probably six to seven feet high. The ditch was dug with steeply sloping sides and a narrow, usually pointed, bottom. There was evidently a good deal of variety in the slope attained, partly due to differences in the working parties, partly due to differences in the nature of the ground. The wall is simply an earthen mound, there is no employment of turves as in Scotland, and this seems to be true throughout its length. There are no signs of stakes fixed in the bottom of the ditch; on the contrary, the palisade was retained in front of the mound and ditch as an essential part of the scheme (*cf.* Fig. 5), and Fabricius states that after careful examination he has come to the conclusion that no hedge, palisade or breastwork was set up on the top of the mound, though probably it and the ditch will have been turfed over

<sup>1</sup> Fabricius, *P-W.*, xiii, 603; Saalburgjahrbuch, ii, 101 (coin), 106-108 (pottery), *O.R.L.*, Str. iii, 48.

<sup>2</sup> *O.R.L.* Str. i, ii, iii, vii-ix, xii. The term *Pfahl* is found throughout the length of the limes, often in the

names of villages, such as Pfahldorf, Pfahlbronn. It is believed to be derived from the Latin *palus*, a stake, and thus to preserve a memory of the Roman frontier (see Str. i, 25 f. and Str. iii, 15).

to preserve their shape.<sup>1</sup> The absence of a berm between wall and ditch would add to the difficulty of climbing the barrier. In certain rocky tracts in the Taunus and near Arnsburg north of the Wetterau a stone wall, or sometimes merely a rough mound of stones, was substituted for the earth mound.<sup>2</sup>

Breaks in the Pfahl, besides occurring at limes-crossings, are found on the slopes of glens at points where the approach from the outside becomes exceptionally difficult, and where, in particular, horsemen could hardly expect to effect a passage. Mere steepness of terrain, however, did not deter the builders, as is seen on the west side of the Aubachtal near Neiderbieber. The palisade was retained in front of these gaps. In two places between Gross-Krotzenburg and Rückingen, on the straight limes east of the Wetterau, there are breaks in the Pfahl, 320 and 430

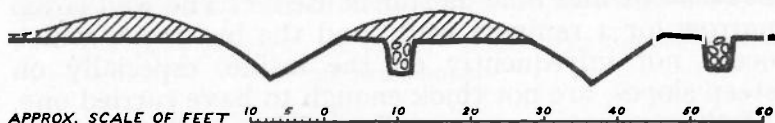


FIG. 5. INTERSECTION OF TWO FRONTIER BARRIERS NEAR THE FELDBERG  
(After sketch in *Arch. Anz.*, 1899, p. 80)

yards respectively, owing to swamps. The road, which runs throughout the stretch thirty to forty-five yards behind the rampart, was carried across the swamps as a corduroy way and, instead of the Pfahl and palisade, a row of huge oaken posts sunk ten feet into the ground served as a barrier.<sup>3</sup> The Pfahl comes to an end near Lorch, where the boundary between Germania Superior and Raetia is thought to lie, and there is a gap of two and a half miles before the Raetian wall begins.

#### *The Raetian Stone Wall*<sup>4</sup> (Pls. iv A and v, and Fig. 4)

This great work, commonly known as the Devil's Wall (Teufelsmauer), fills the purpose served by the

<sup>1</sup> O.R.L., Str. vii-ix, 29 n. 1 (a reply to Hertlein's views set forth in *R.W.*, i, 132).

<sup>2</sup> O.R.L., Str. iii, Pls. 8 and 9 (Weissenstein, etc., between Saalburg

and Feldberg; here the ditch is discontinued); *Limesblatt*, 640, 643-4 (near Arnsburg, with a ditch).

<sup>3</sup> *S.W.*, 16.

<sup>4</sup> O.R.L., Str. xii, xiii, xiv, xv.

Pfahlgraben in Upper Germany. It is indeed, more continuous than the Pfahlgraben, being without breaks except for rivers and gateways. It begins rather oddly ninety-five yards west of the Rotenbach, a small tributary of the Rems, between the forts of Lorch and Schierenhof. The end of the wall is faced with specially large stones, so it is unlikely that it ever ran beyond this point, perhaps because between the Rotenbach and Lorch attack from the north is specially difficult. Not far away a fragment was found of an altar which may have been erected to celebrate its completion. The wall near Eining runs right down to the Danube, and for the last few yards is reinforced against damage from floods with extra large blocks of stone. The average thickness of the wall is four feet and its foundation is very shallow. It is built of roughly hewn stone and lime mortar is used.<sup>1</sup> The wall is too narrow for a rampart walk, and the buttresses which occur not infrequently on the inside, especially on steep slopes, are not thick enough to have carried one. At the present day the wall rarely exceeds three feet in height and the original height is not easy to determine, but a minimum of ten Roman feet ( $8\frac{1}{2}$  feet) seems likely.<sup>2</sup> There is no ditch, and the palisade was not retained as part of the system. The wall generally runs quite straight from tower to tower, and its outer side is flush with the outer walls of the towers, though exceptions to this occur. Apertures for drainage are left fairly frequently. By the Sulsach crossing the wall is built of exceptionally big blocks fourteen cubic feet in size (Pl. iv B); at this point gaps were left to let the water through in times of flood, and there is a break of 123 feet for the river itself.

Between stations 34 and 35 on stretch 13 there is a swampy valley over which for 300 ft. the wall was

<sup>1</sup> O.R.L., xv, 21, mentions an exception east of watch-tower 33, where the wall is built of rough blocks of dolomite. (It is not possible to state whether or not mortar was used here.)

<sup>2</sup> O.R.L., Str. xiv, 34. It was possible to replace the outer stones of the fallen wall one upon the other to a height of eight feet at a point near Gunzenhausen.



A. MONUMENT STANDING ON RAETIAN WALL. THE DANUBE IS SEEN IN THE BACKGROUND



B. THE 'CAPUT LIMITIS' ON THE DANUBE BELOW EINING  
(The pillar of fig. 1, indicated by the arrow, is on the skyline. The *limes* runs straight down to the river and can be made out as a slightly raised field boundary)  
(From *Greece and Rome*, III, 1933)

carried on a platform of piles (Pl. i B). Near Ruffenhofen the wall runs far to the rear of the palisade, to avoid the difficulties presented by the river Wörnitz, which it is suggested may have changed its course in Roman times and thus decided the builders of the wall to keep away on higher ground. The wall is strengthened in a few places, probably through repair work.

*The Wall behind the Pfahlgraben on Stretch VIII<sup>1</sup>*

From the neighbourhood of Jagsthausen to beyond Osterburken there is a stone wall which, with a few breaks, runs from tower to tower behind the Pfahl for  $10\frac{1}{2}$  miles. It seems to represent a final effort at strengthening the frontier line, perhaps because here raids from the Tauber valley were specially severe. If there was ever an intention of continuing this wall to Miltenberg and Lorch it was never carried out. In places the wall is as thick as the Raetian wall, but elsewhere it is only two-and-a-half feet thick. It lies forty to fifty feet behind the main ditch and sometimes keeps to the west of the watch-towers, at other times abutting on their walls.

THE LAST DAYS OF THE LIMES

After the time of Caracalla we hear of constant trouble on the northern frontiers ; in the early thirties of the century a serious inroad had to be met by Severus Alexander, newly returned from warfare against the rising power of Persia.<sup>2</sup> He entered Germany in 233, accompanied by his mother, Julia Mamaea, who is commemorated on many Rhineland inscriptions, sometimes as Mater Castrorum,<sup>3</sup> but his efforts were hampered by mutinous troops who finished by murdering him near Mainz in 235.<sup>4</sup> Maximinus Thrax, his brutal successor, was at any rate not backward in fighting the external barbarian, and his title Germanicus was well earned,<sup>5</sup> but he was

<sup>1</sup> *O.R.L.*, Str. vii-ix, 31 ff.

<sup>2</sup> Herodian, vi, 7.

<sup>3</sup> *C.I.L.*, xiii, 7495.

<sup>4</sup> Orosius, vii, 18 ; Herod. viii, 1.

<sup>5</sup> *C.I.L.*, xiii, 6547 (Oehringen).  
Orosius, vii, 19.



not able permanently to stem the tide. Northern Raetia had fared especially badly; Pfünz had been stormed, and many neighbouring forts, and they were not all reoccupied. Weissenburg, however, remained in Roman hands until 253, the coin series at Kösching lasts till 238, and Heidenheim, further west, has coins of Gordianus III.<sup>1</sup> The German limes was in better case; forts which had suffered were rebuilt. The last inscriptions across the Rhine are two of the time of Decius (249-51) recording building at Stockstadt and at Kapersburg, and league stones of this emperor, Valerian and Gallienus (253-268).<sup>2</sup> The coin series in some forts lasts on into the fifties, notably in Niederbieber, which was evidently stormed in 260.<sup>3</sup> In that year Germans penetrated into Italy itself; the Alemanni ravaged Avenches in Switzerland, while Goths were scouring the eastern parts of the empire and Franks were pouring across the lower Rhine. Meanwhile Roman armies were devouring each other at the bidding of ephemeral emperors. The *Laterculus Veronensis* records that the Roman townships across the Rhine were occupied by the barbarians in the reign of Gallienus; all the evidence points to this as the time when the limes was finally abandoned.<sup>4</sup>

Many of the Romanised inhabitants of the limes territory must have been gradually deserting their homes, or taking refuge in walled towns such as Heddernheim.<sup>5</sup> Sometimes, like the barbarians of an earlier day, they would cling to their old homes, flying to hill strongholds when danger threatened.<sup>6</sup> Even after the abandonment of the limes the Romans

<sup>1</sup> *O.R.L.*, 73 (Pfünz), 72 (Weissenburg); *Ger.*, xviii, 1934, 135-6.

<sup>2</sup> *C.I.L.*, xiii, 6658 (Stockstadt); 7440 (Kapersburg). At Jagsthausen and elsewhere on the outer limes there are inscriptions of the forties. 9109 (Decius: Heidelberg); 9103 (Valerian and Gallienus: Ladenburg).

<sup>3</sup> *B.ŷ.*, cxx, 1911, 276.

<sup>4</sup> Seeck, *Notit. Dig.* 253. *Istae civitates trans Rhenum . . . sub Gallieno imperatore a barbaris occupatae sunt.* Zosimus, i, 30,

mentions the Rhine as the boundary of the empire under Gallienus.

<sup>5</sup> *S.W.*, 13, 123; K. Woelcke, *Germ.*, xv, 1931, 79 (Heddernheim); H. Gropengiesser, *Germ.*, xi, 1927, 56 (Ladenburg).

<sup>6</sup> *O.R.L.*, 72 (Weissenburg), 26; 73a (Bohming), 6 ff., suggest the possibility of this; cf. Kempton (Wagner, *Romer in Bayern*, 4th edn., 60) where the late Roman settlement abandons the town on the right bank of the Iller and seeks refuge in the former Celtic stronghold on the left bank.

endeavoured to hold Wiesbaden,<sup>1</sup> but in the period of reorganisation that we reach with Diocletian, there was no attempt to retake the land. There was developed instead an entirely new series of fortifications along the Rhine and Danube themselves and the old Roman limes was left to become the haunt of devils, giants and hobgoblins.

## APPENDICES

### I. THE DATING OF THE LIMES

It will perhaps be as well to give a few extra notes as to how the history of the limes, in particular that of Domitian, has been established. The scanty ancient literary sources for the history of Roman Germany provide a little general information. Tacitus, writing in the reign of Trajan, comments on land across the Rhine and Danube having been taken within the empire; Domitian's Chatti war of 83 and Saturninus' rebellion of 89 are referred to by Suetonius, Dio and others; the real significance of the campaigns against the Chatti is brought out by Frontinus alone, as noticed above (p. 7).<sup>2</sup>

We are fortunate in having a series of military diplomas giving lists of the units stationed in Germany and Raetia at different times, so that if the garrison of a given fort can be determined the date of its occupation can often be deduced.<sup>3</sup> Domitian also struck coins with the legend *Germania capta* after the First Chatti War, and we have records of his acclamation as Imperator; other inscriptions of the *Fratres Arvales* enable us to follow the events of the rebellion of Saturninus.<sup>4</sup>

Perhaps the most important of all the evidence is that of the tile stamps.<sup>5</sup> In Upper Germany, until 83, the tileworks of the Mainz legions were at Rheinabern; in 83, after the annexation of the new territory by Domitian, they were removed to Nied, by Hedderheim. A careful study has been made of the stamps from these tileworks, and of the nature of the clay in each locality, as well as of the history of the legions themselves. The Hedderheim fort was laid out immediately after the 83 war, for a few tiles of Rheinabern

<sup>1</sup> S.K.G., ii, 52.

<sup>2</sup> Tac. *Germ.* 29; Suet. *Dom.* 6-7; Dio, lxvii, 5 and 11; Aurel. Vict., *Caes.*, 11; Statius, *Silv.* iv, 2, 66; Frontinus, *Strat.* I, i, 8; II, iii, 23; II, xi, 7, and most important, I, iii, 10.

<sup>3</sup> Collected in Stein, 'Die Kaiserlichen Beamten und Truppenkörper

im römischen Deutschland unter dem Prinzipat,' 1932, 280-7.

<sup>4</sup> Cohen, 135 f., 176 ff., 469, 472, 483, 491, 496, 503; *C.I.L.*, iii, pp. 1962-3; v, 3356; vi, 1347 and 2066.

<sup>5</sup> Ritterling, *R.G. Korr. Bl.*, iv, 37-42; Wolff, *ibid.*, viii, 33-38; *Ber.* ix, 1916, 86 ff.; *Ger.*, xiii, 1929, 113-126.

clay are found in the earliest baths there, but tiles from the Nied works soon came into use—in time to complete the same building. The legions represented by these stamps are Leg. I Adiutrix (transferred to the Danube about 86), XIV, VIII (at Strasbourg from early in the reign), XI and XXI Rapax, which were concentrated at Mainz for Domitian's Chatti war. These baths were destroyed a few years later, evidently by the allies of Saturninus, and new baths had to be constructed. In these we still find a few tiles of Leg. XIV, which was removed to Pannonia very shortly after the revolt, but we also find tiles of Leg. XXII P.P.F. which was brought in from Lower Germany to take the place of XIV and XXI, and which remained at Mainz throughout the rest of our period. Its tiles can be divided into clearly-marked periods; for the earliest stamps the same matrices seem to have been used as had been employed at Xanten, the legion's previous tileries. Their occurrence in the second Heddernheim baths confirm the dating of the latter to the end of Domitian's reign. With the Heddernheim observations as a basis, the other forts of Domitian can be dated, and additional factors, notably the regularity and uniformity of their construction, and the lay-out of the roads, can be adduced. The small baths attached to the early earth forts of the Taunus and Odenwald have also been dated principally by their tiles.<sup>1</sup>

With the secure dating of the Domitianic forts at Heddernheim, Hofheim, Okarben, Friedberg and Kesselstadt, and hence of their pottery, it became possible to place additional reliance on the evidence supplied by pottery from other sites.<sup>2</sup> Immediately after the Wetterau had been brought within the empire, potters established themselves there, and began to manufacture some distinctive painted wares. Ovens have been found at Heddernheim, Friedberg and Heldenbergen, and Wolff laid the foundations for the study of these wares and their use for dating purposes.<sup>3</sup> They, along with terra sigillata and tile stamps enable the forts of Hadrian to be recognised. Hadrian's forts can also often be checked by establishing the date when Domitian's cohort forts were abandoned. A case in point is the removal of the cohort from Wiesbaden, where its camp remained unoccupied, even by civilians, to the Saalburg, where first a wood, and then a stone and wood fort were built. The latter was dedicated in the first year of Antoninus Pius.<sup>4</sup>

It is chiefly through the finding of south Gallic pottery that the Domitianic forts in Raetia can be dated. Cannstatt also has been carefully excavated, and the considerable quantity of Flavian sigillata there found has enabled the chain to be completed.<sup>5</sup>

The advance to the line Miltenberg-Lorch must have come before 161, for which year there is an inscription at Jagsthausen

<sup>1</sup> E.g., Zugmantel has tiles of Leg. I Adiut. xiv, and xxi, which dates it before 89; the Odenwald forts belong to the end of the reign.

<sup>2</sup> See O.R.L., where finds of pottery and other objects are carefully described.

<sup>3</sup> G. Wolff, 'Röm. Topfereien in der Wetterau,' *W.Z.*, xviii, 1899, 211-240.

<sup>4</sup> *C.I.L.*, xiii, 7462.

<sup>5</sup> Goessler and Knorr, *Cannstatt zur Römerzeit*, 1921.

(not a building inscription).<sup>1</sup> The latest inscriptions on the inner line are those of the Odenwald watch-towers, of 145-6, and one at Bockingen, of 148.<sup>2</sup> The earliest pottery found on the outer limes is not later than 150.<sup>3</sup>

The discovery of so many dated inscriptions on the outer limes has been of great value to archaeologists and has helped the secure dating of Rhein Zabern sigillata, so that some of the pottery in these forts is dated from the forts, rather than the forts from the pottery.

## II. FORTS ON THE LIMES<sup>4</sup>

The scope of this paper forbids a detailed discussion of the forts and their garrisons, but the following notes may be of interest. The larger limes forts have the same general characteristics as those in other parts of the empire. Counting in cohort forts to the rear, like those of the Wetterau and Upper Neckar, there are more than seventy-five; in the final period of the limes there were at least fifty cohort and *numerus* forts along the frontier, or a mile or two to the rear. The forts on the German limes being anterior to the permanent barrier, and generally a few hundred yards behind the signal tower line, we never find fort wall and frontier work continuous, as on the Antonine Wall, and the line of the palisade was determined by the signal towers rather than by the forts: the same applies to the Raetian Wall, which does not run from fort to fort, but from tower to tower.<sup>5</sup> In Britain, the cohorts lay much more closely together than in Germany, where some of the forts were occupied by auxiliaries of the second class, the *numeri*. The cohorts were on an average 1.8 miles apart on the Antonine Wall, 4.3 miles apart on Hadrian's Wall (they vary from two to eight miles apart). In Germany the forts may even be ten miles distant from one another, and seven miles is a common interval. On the East Wetterau alone are they as close as the Hadrian's Wall average. The *Zwischenkastelle* or intermediate posts, are therefore more necessary in Germany than in Britain; only when we count them in does the German average correspond to that of Hadrian's Wall. The British Walls were more strongly held, in proportion to their length, than the German walls, in compliment, we may believe, to the Caledonians.

Earth forts in Germany belong to the earlier period. The turnover to stone was already going on under the Flavians<sup>6</sup>; after

<sup>1</sup> *C.I.L.*, xiii, 6561.

<sup>2</sup> See p. 21, note 1, and *C.I.L.*, xiii, 6469.

<sup>3</sup> K. Stade, 'Einzelfunde,' in *O.R.L.*, Str. vii-x (issued with Lieferung 49).

<sup>4</sup> Detailed information may be obtained from Fabricius' article, 'Limes,' in *P.W.*, xiii; from *G.R.*, i, *O.R.L.* and *R.W.*

<sup>5</sup> The palisade crosses the Domiti-

anic fort of Seckmauern in the Odenwald. The Welzheim East fort is the only instance of one lying outside the limes, and the reason for this is not yet clear.

<sup>6</sup> These remarks apply to the Roman territory across the Rhine and Danube; the legionary fortress of Vindonissa was rebuilt in stone at the time of Claudius (R. Laur-Belart, 'Vindonissa,' 1935, 4).

the rebellion of Saturninus the Wetterau forts were rebuilt in stone with a timber framework; Hadrian's second Saalburg fort is of this type; under the Antonines the timbering gradually vanishes. The Flavian forts tend to be square rather than oblong, the reverse is true of later forts. It is also to be noted that the forts of the Antonine period are generally appreciably larger than corresponding forts of an earlier age. This is specially noticeable in comparing the forts of the outer with those of the Neckar frontiers.

The annexe, so regularly found on the dangerous British Antonine frontier, is rare in Germany. One of the early forts at Heddernheim has one; there are two on the limes. That at Osterburken was built partly to accommodate a numerus, partly to include a slight hill, which had overlooked the fort, within the fortifications. The annexe attached to the Neckarburken numerus fort corresponds more nearly to the British type, for it appears to have been constructed as a refuge for the neighbours and their cattle in times of trouble. Another common British feature, the multiple ditch system, has not so far been found in Germany.

### III. GATEWAYS AND BRIDGES

The location of gateways in the limes is rendered particularly difficult by the lack of any such regular system as that of the forts and milecastles of Hadrian's Wall. Numerous important ancient tracks cross the limes, but their long-continued use has ensured the disappearance of the gateways which may have existed. Breaks in the palisade have rarely been found, but one example six feet wide on Stretch i is flanked by two extra-stout posts<sup>1</sup> (Fig. 2); at another, in Raetia, the ditch was continued across the opening and over it a rough wooden bridge seems to have been laid. Remains of bronze lettering found here, the only instance of the kind known on the limes, suggest that there was an inscription on this gateway.<sup>2</sup> Openings in the Pfahlgraben are less hard to identify and are fairly frequent (Figs. 1 and 2). In one case in the Taunus the rampart at each side of the opening bends inwards to give extra protection.<sup>3</sup> A titulus, at one period, defended an opening in the limes near the Saalburg,<sup>4</sup> Plenty of openings have been found in the Raetian Wall; Figure 4 shows a paved Roman road which crossed the limes in the 'Flechtwerkzaun' period, but which was blocked by the later wall. At another opening, twenty-seven feet wide, the edges of the wall are thickened, as if to support gateposts.<sup>5</sup>

Rivers seem to have been bridged where the limes crossed them, or at any rate were provided with paved fords. There was a wooden bridge over the Aar.<sup>6</sup> At Kesselstadt and Gross-Krotzenburg, where the inner and outer limes reach the Main, remains of

<sup>1</sup> O.R.L., Str. i, Plate 18.

<sup>2</sup> O.R.L., Str. xiv, Plate 5.

<sup>3</sup> *Limesblatt*, 429.

<sup>4</sup> *Saalburgjahrbuch*, ii, Plates 18 and 19. O.R.L., Str. iii, Plate 10, 3.

<sup>5</sup> O.R.L., Str. xiii, Plate 7.

<sup>6</sup> O.R.L., Str. iii, Plate 2, 1.

the iron-shod piles supporting the Roman bridges have been found.<sup>1</sup> Roads came up from Mainz along both sides of the river, and no fewer than five intermediate bridges have been found, in addition to the Rhine bridge between Mainz and Kastel. The Sulzach crossing noted above (p. 32) is marked by piers over which ran a bridge, and signs of another bridge were noted at Kipfenberg. A well-marked ford was found at Gunzenhausen.

#### IV. ROAD STATIONS

An essential part of the Roman road system was the road station, and evidence is not lacking of the existence along important military roads in Upper Germany and Raetia, both of watch-towers analogous to those of the frontier itself, and of more substantial stations with accommodation for travellers and their animals. The most important of these stations is the 'Burgus' in the Harlach, in the neighbourhood of Weissenburg, a building 105 ft. by 124 ft., with a central court surrounded by a series of rooms.<sup>2</sup>

#### V. MISCELLANEA

One or two special local features of the limes deserve to be mentioned. There is the crossing, in a distance of about a mile and a half, of both the deep Sayn and Brex gorges, north of Bendorf, involving a steep drop from 500 ft. above sea level to 250 ft., a climb to 700 ft., a drop to 280, and another climb to 750. The Pfahl was not carried up and down these ravines; the palisade sufficed.

A gap of four miles in the rampart, but not in the palisade, a little to the north of Kemel has not been satisfactorily explained. Dr. Fabricius suggests that as the signal towers are specially close together here, the Pfahlgraben was possibly considered superfluous.

The Taunus Stretch is remarkable for the number of changes in the lay-out of the limes which it shows; in a number of places there are two lines.<sup>3</sup> On a 6 km. stretch between Zugmantel and Heftrich the inner, older line has only the Domitianic wooden towers, the outer one, in some places 700 m. distant, has the palisade and Pfahl, and only stone towers. West of the Feldberg both the outer and inner lines have palisade ditches. The second line in each case seems to have been drawn to cut off bends in the older one which followed the contours strictly. Still more curious is the occurrence of two mounds for about half a mile along the slopes of the Feldberg, the second work again cutting off a corner. The occurrence of a palisade with both mounds affords valuable evidence that it was regarded as an integral part of the final frontier scheme (Fig. 5). The impression of work being found for idle hands which this stretch gives is interesting to compare with that given by the

<sup>1</sup> O.R.L., Str. vi, Plates 10 and 11.

<sup>2</sup> Wolff, 'Etappenstationen im Hinterlande,' *Ber.* ix, 66-86; *R.G.*

*Korr. Bl.*, ii, 1909, 68 f.; *G.R.*, i, Plate xvii (Harlach Burgus).

<sup>3</sup> O.R.L., Str. iii, 16-19, 34.



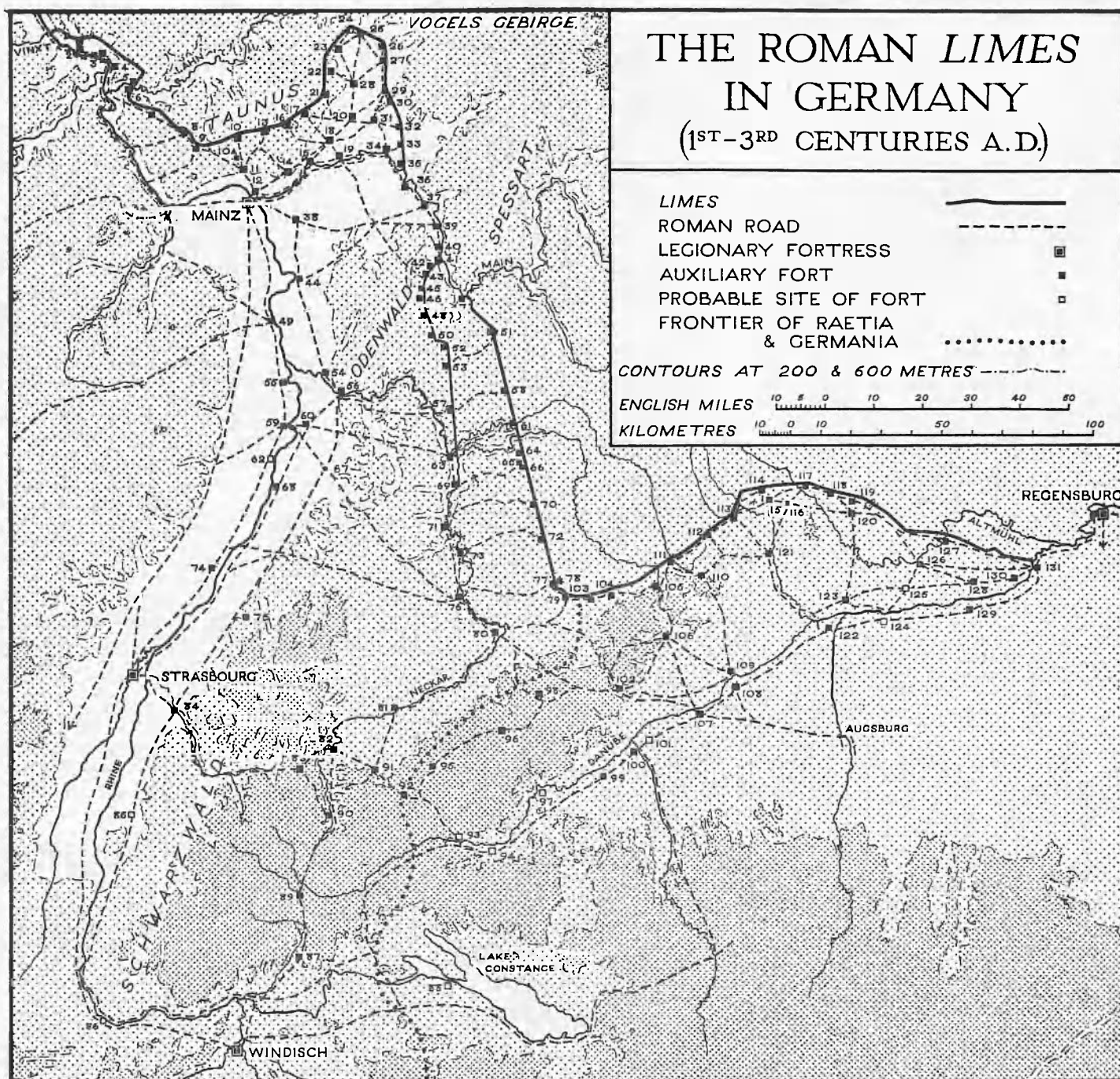
unfinished Pfahl on Stretch vii, one of the mysteries of the limes. A series of gaps, often some hundreds of yards in length, occurs in the Pfahl, but not in the palisade, between Miltenberg and Walldürn; in places also the ditch is very shallow and the rampart seems never to have been completed. It looks as if a number of working parties still engaged on their allotted sections were suddenly called off. This can only have been because of some serious emergency, perhaps one of the many Alemannic inroads a little further south. Whatever it was, they never returned to their work, and the limes remained unfinished.

The extra wall near Jagsthausen a little further south has already been noticed (above, p. 33). In six places along this wall badly-preserved foundations of stone outworks, jutting forward from wall to Pfahl, in some cases measuring thirty feet by forty-five feet, have been discovered. Their purpose is not yet known: they resemble artillery platforms and occur at a dangerous part of the frontier, but their state is so fragmentary that they may remain an enigma.

#### VI. KEY TO NUMBERED SITES ON MAP, PL. VI

- |                    |                         |
|--------------------|-------------------------|
| 1. Niederbieber.   | 29. Oberflorstadt.      |
| 2. Heddesdorf.     | 30. Altenstadt.         |
| 3. Bendorf.        | 31. Heldenbergen.       |
| 4. Niederberg.     | 32. Markobel.           |
| 5. } Ems.          | 33. Ruckingen.          |
| 6. }               | 34. Kesselstadt.        |
| 7. Marienfels.     | 35. Gross. Krotzenburg. |
| 8. Holzhausen.     | 36. Seligenstadt.       |
| 9. Kemel.          | 37. Stockstadt.         |
| 10. Zugmantel.     | 38. Gross. Gerau.       |
| 10A. Heidekringen. | 39. Niedernberg.        |
| 11. Wiesbaden.     | 40. Obernburg.          |
| 12. Kastel.        | 41. Worth.              |
| 13. Heftrich.      | 42. Seckmauern.         |
| 14. Hofheim.       | 43. Lützelbach.         |
| 15. Hochst.        | 44. Gernsheim.          |
| 16. Feldberg.      | 45. Vielbrunn.          |
| 17. Saalburg.      | 46. Eulbach.            |
| 18. Heddernheim.   | 47. Miltenberg.         |
| 19. Frankfurt.     | 48. Würzburg.           |
| 20. Okarben.       | 49. Worms.              |
| 21. Kapersburg.    | 50. Hesselbach.         |
| 22. Langenhain.    | 51. Walldürn.           |
| 23. Butzbach.      | 52. Schlossau.          |
| 24. Grüningen.     | 53. Oberscheidenthal.   |
| 25. Arnsburg.      | 54. Ladenburg.          |
| 26. Inheiden.      | 55. Rheingonheim.       |
| 27. Echzell.       | 56. Neuenheim.          |
| 28. Friedberg.     | 57. Neckarburken.       |





- |     |                |      |                   |
|-----|----------------|------|-------------------|
| 58. | Osterburken.   | 95.  | Burladingen.      |
| 59. | Speyer.        | 96.  | Gomadingen.       |
| 60. | Hockenheim.    | 97.  | Emerkingen.       |
| 61. | Jagsthausen.   | 98.  | Donnstetten.      |
| 62. | Germersheim.   | 99.  | Risstissen.       |
| 63. | Wimpfen.       | 100. | Unterkirchberg.   |
| 64. | Westernbach.   | 101. | Finningen.        |
| 65. | } Ohringen.    | 102. | Urspring.         |
| 66. |                | 103. | Schierenhof.      |
| 67. | Stettfeld.     | 104. | Unterbobingen.    |
| 68. | Hochstetten.   | 105. | Aalen.            |
| 69. | Böckingen.     | 106. | Heidenheim.       |
| 70. | Mainhardt.     | 107. | Günzburg.         |
| 71. | Walheim.       | 108. | Aislingen.        |
| 72. | Murrhardt.     | 109. | Faimingen.        |
| 73. | Benningen.     | 110. | Oberdorf.         |
| 74. | Selz.          | 111. | Buch.             |
| 75. | Baden.         | 112. | Halheim.          |
| 76. | Cannstatt.     | 113. | Ruffenhofen.      |
| 77. | } Welzheim.    | 114. | Dambach.          |
| 78. |                | 115. | Unterschwaningen. |
| 79. | Lorch.         | 116. | Gnotzheim.        |
| 80. | Kongen.        | 117. | Gunzenhausen.     |
| 81. | Rottenburg.    | 118. | Theilenhofen.     |
| 82. | Sulz.          | 119. | Ellingen.         |
| 83. | Waldmössingen. | 120. | Weissenburg.      |
| 84. | Offenburg.     | 121. | Munningen.        |
| 85. | Riegel.        | 122. | Burghofe.         |
| 86. | Basle.         | 123. | Gansheim.         |
| 87. | Schleitheim.   | 124. | Mühlhartsfurt.    |
| 88. | Constance.     | 125. | Nassenfels.       |
| 89. | Hufingen.      | 126. | Pfunz.            |
| 90. | Rottweil.      | 127. | Bohming.          |
| 91. | Geislingen.    | 128. | Kosching.         |
| 92. | Lautlingen.    | 129. | Oberstimm.        |
| 93. | Laiz.          | 130. | Pföding.          |
| 94. | Mengen.        | 131. | Eining.           |

The *Stretches* into which the Reichs-Limes Kommission have divided the Limes are as follows :—

- |         |                                                    |       |                                    |
|---------|----------------------------------------------------|-------|------------------------------------|
| i.      | Rhine to Lahn.                                     | x.    | Odenwald.                          |
| ii.     | Lahn to Aar.                                       | xi.   | Neckar.                            |
| iii.    | High Taunus.                                       | xii.  | Haghof to Bavarian frontier.       |
| iv.     | and v. N-W, N. and E.                              | xiii. | Bavarian frontier to Gunzenhausen. |
|         | Wetterau.                                          |       |                                    |
| vi.     | Main.                                              | xiv.  | Gunzenhausen to Kipfenberg.        |
| vii-ix. | Outer Limes (Miltenberg to Haghof, near Welzheim). | xv.   | Kipfenberg to Danube.              |