

MEDIEVAL
TECHNOLOGY
AND SOCIAL
CHANGE

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CHAPTER I

Stirrup, Mounted Shock Combat, Feudalism, and Chivalry

THE history of the use of the horse in battle is divided into three periods: first, that of the charioteer; second, that of the mounted warrior who clings to his steed by pressure of the knees; and third, that of the rider equipped with stirrups.¹ The horse has always given its master an advantage over the footman in battle, and each improvement in its military use has been related to far-reaching social and cultural changes.²

Before the introduction of the stirrup, the seat of the rider was precarious.³ Bit⁴ and spur⁵ might help him to control his mount; the simple saddle⁶ might confirm his seat; nevertheless, he was still much restricted in his methods of fighting. He was primarily a rapidly mobile bowman and hurler of javelins. Swordplay was limited because 'without stirrups your slashing horseman, taking a good broadhanded swipe at his foe, had only to miss to find himself on the ground'.⁷ As for the spear, before the invention of the stirrup it was wielded at the end of the arm and the blow was delivered with

¹ See p. 135.

² See p. 135.

³ Cf. H. Müller-Hickler, 'Sitz und Sattel im Laufe der Jahrhunderte', *Zeitschrift für historische Waffen- und Kostümkunde*, x (1923), 9.

⁴ R. Zschille and R. Forrer, *Die Pferdetrense in ihrer Formentwicklung* (Berlin, 1893); H. A. Potratz, 'Die Pferdegebisse des zwischenstromländischen Raumes', *Archiv für Orientforschung*, xiv (1947), 1-39; A. Mozsolics, 'Mors en bois de cerf sur le territoire du bassin des Carpathes', *Acta archaeologica* (Budapest), iii (1953), 69-109; M. Schiller, 'Trense und Kandare', *Wissenschaftliche Zeitschrift der Humboldt-Universität zu Berlin, Math.-naturwiss. Reihe*, vii (1957-8), 465-95.

⁵ C. de L. Lacy, *History of the Spur* (London, 1911); J. Martin, *Der Reitersporn: seine Entstehung und früheste Entwicklung* (Leipzig, 1921); K. Friis-Johansen, 'Et bidrag til ryttersporens ældste historie', *Corrolla archaeologica in honorem C. A. Nordman* (Helsinki, 1952), 41-57.

⁶ A. Schlieben, 'Reit- und Packsättel der Alten', *Annalen des Vereins für Nassauische Altertumskunde*, xxi (1889), 14-27; R. Norberg, 'Om förhistoriska sadlar i Sverige', *Rig*, xii (1929), 97-113; J. Werner, 'Beiträge zur Archäologie des Attila-Reiches', *Bayerische Akademie der Wissenschaften, Phil.-hist. Klasse, Abhandlungen*, Heft 38A (1956), 50-53; *infra*, p. 7, n. 1.

⁷ D. H. Gordon, 'Swords, rapiers and horseriders', *Antiquity*, xxvii (1953), 75.

the strength of shoulder and biceps.¹ The stirrup made possible—although it did not demand—a vastly more effective mode of attack: now the rider could lay his lance at rest, held between the upper arm and the body, and make at his foe, delivering the blow not with his muscles but with the combined weight of himself and his charging stallion.

The stirrup, by giving lateral support in addition to the front and back support offered by pommel and cantle, effectively welded horse and rider into a single fighting unit capable of a violence without precedent. The fighter's hand no longer delivered the blow: it merely guided it.² The stirrup thus replaced human energy with animal power, and immensely increased the warrior's ability to damage his enemy. Immediately, without preparatory steps, it made possible mounted shock combat, a revolutionary new way of doing battle.

What was the effect of the introduction of the stirrup in Europe?

I

The Classic Theory of the Origins of Feudalism, and its Critics

The historian of Frankish institutions too often recalls to the wearied mind Eliza on the ice: hypothesis clutched to bosom, he leaps from suspect charter to ambiguous capitulary, the critics baying at his heels. So thin and so slippery of interpretation are the written remains from the Germanic kingdoms that one might expect that scholars exploring the sources of feudalism would have made every effort to supplement the extant documents with the archaeological material which, in recent years, has begun so greatly to modify our view of the early Middle Ages. But this is not the case: the vast literature of ingenious controversy about feudal origins has been

¹ As noted first, among scholars, by H. Delbrück, *Geschichte der Kriegskunst* (Berlin, 1900), i. 141.

² In the twelfth century Usāmah clearly defined the greater efficiency of shock combat and the new relation between man and horse: 'He who is on the point of striking with his lance should hold his lance as tightly as possible with his hand and under his arm, close to his side, and should let his horse run and effect the required thrust; for if he should move his hand while holding the lance or stretch out his arm with the lance, then his thrust would have no effect whatever, and would result in no harm' (*An Arab-Syrian Gentleman and Warrior in the Period of the Crusades: Memoirs of Usāmah ibn Munqidh*, ed. and tr. P. K. Hitti [New York, 1929], 69-70; cf. also 173 and 175 for relation of stirrup to the lance at rest).

produced chiefly by legal and constitutional historians, and therefore is almost entirely a matter of textual exegesis.

The first stage in the discussion culminated in 1887 with the publication of Heinrich Brunner's 'Der Reiterdienst und die Anfänge des Lehnwesens'.¹ Brunner codified, synthesized, and extended the findings of his predecessors so brilliantly that his has become the classic theory of the inception of feudal society.

According to Brunner, feudalism was essentially military,² a type of social organization designed to produce and support cavalry. The early Germans, including the Franks, had fought to some extent on horseback, but in proportion as agriculture displaced herding as the basis of their economy, the use of cavalry declined. The Franks in particular came to fight almost entirely on foot: indeed, their typical weapon, the *francisca*, was efficient only in the hands of infantry. Brunner believed that as late as 732³ Charles Martel's army which met the Saracens near Poitiers was composed primarily of footmen who, in the famous words of the so-called Isidorus Pacensis, 'stand rigid as a wall and, like a belt of ice frozen solidly together, slay the Arabs with the sword'.⁴ Yet in an account of the battle of the Dyle in 891, we are told that 'the Franks are unused to fighting on foot'.⁵ When did this change from infantry to cavalry take place among the Franks?

Brunner worked back through the available evidence and concluded that the armies of Charlemagne and his successors were primarily mounted. In 758 Pipin changed the Saxon tribute from cattle to horses.⁶ In 755 the Marchfield, the traditional muster of the Frankish army, was transferred to May, presumably because the

¹ *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte, Germanistische Abteilung*, viii (1887), 1-38; reprinted in Brunner's *Forschungen zur Geschichte des deutschen und französischen Rechts* (Stuttgart, 1894), 39-74. For the earlier discussion, see C. Stephenson, 'The origin and significance of feudalism', *American Historical Review*, xlv (1941) 788-94.

² See p. 135.

³ The date was an error. M. Baudot, 'Localisation et datation de la première victoire remportée par Charles Martel contre les Musulmans', *Mémoires et documents publiés par la Société de l'École des Chartes*, xii. i (1955), 93-105, shows that this battle occurred not in 732 but on 17 Oct. 733, a few kilometres north-east of the confluence of the Vienne and the Creuse.

⁴ See p. 136.

⁵ 'Francis pedetemptim certare inusitatum est' (*MGH, Scriptores*, i. 407). The importance of this passage is not diminished by E. von Frauenholz, *Das Heerwesen der germanischen Frühzeit, des Frankenreiches und des ritterlichen Zeitalters* (Munich, 1935), 65. See also the remark of Einhard, writing before 836, regarding Charlemagne's love of riding and hunting: 'Vix ulla in terris natio invenitur quae in hac arte Francis possit aequari' [*Vita Caroli magni*, c. 22, ed. L. Halphen (Paris 1923), 68].

⁶ *MGH, Scriptores*, i. 140.

infantry
to
cavalry
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number of cavalry had become so large that more forage was needed than was available in March.¹ The military reform must therefore have occurred between the battle of Poitiers, dated by him in 732, and the year 755.

Brunner then turned his attention to the vast and ruthless confiscations of Church lands effected by Charles Martel. There is ample evidence that the great Mayor of the Palace seized these lands and distributed them to retainers in order to strengthen his armed forces. In 743 his son Carloman excused his own retention of these secularized estates 'propter imminencia bella et persecutiones ceterarum gentium quae in circuitu nostro sunt . . . in adiutorium exercitus nostri',² while Pope Zacharias accepted the deplorable situation 'pro eo quod nunc tribulatio accidit Saracinarum, Saxonum vel Fresonum'.³ Martel's diversion of a considerable part of the Church's vast riches to military purposes therefore was contemporary with the shift of the focus of the Frankish army from infantry to cavalry.

No surviving document explicitly connects the two developments,⁴ but in view of the great expense of maintaining war-horses, Brunner concluded that they were in fact related. Martel had felt some urgent compulsion suddenly to increase the cavalry at his disposal. In the agricultural economy of eighth-century Gaul, in which soil was the most important form of income-bearing wealth and in which the tax-collecting system was rudimentary, mounted warriors could only be maintained in large numbers by landed endowment. The estates of the Church were available for his purpose;⁵ these he seized and handed over to an enlarged body of followers on condition that they serve him on horseback. Failure to fulfil this military duty involved forfeiture of the endowment held under such obligation.

¹ See p. 136.

² *MGH, Capitularia*, i. 28, c. 2.

³ *MGH, Epistolae*, iii, no. 324; E. Lesne, *Histoire de la propriété ecclésiastique en France*, II. i: *Les Étaps de la sécularisation des biens d'église du VIII^e au X^e siècle* (Lille, 1922), 7-9, lends support to Brunner's thesis.

⁴ Brunner might have adduced a passage in the *Capitulare missorum*, probably of 792 or 786 (*MGH, Cap.* i. 67), of which the text is very corrupt. Charlemagne commands an oath of loyalty to him by many minor personages: 'qui honorati beneficia et ministeria tenent vel in bassalatico honorati sunt cum domini sui et caballos, arma et scuto et lancea, spata et senespasio habere possunt.' This appears to mean that these men had been honoured with fiefs in order that they might equip themselves for cavalry service; cf. Stephenson, *op. cit.* 804; C. E. Odegaard, 'Carolingian oaths of fidelity', *Speculum*, xvi (1941), 284.

⁵ E. Lesne, *La Propriété ecclésiastique en France aux époques romaine et mérovingienne* (Paris, 1910), 224, estimates that the Church held one-third of the cultivable land of Gaul.

The ancient custom of swearing allegiance to a leader (vassalage) was fused with the granting of an estate (benefice), and the result was feudalism. Protofeudal and seigniorial elements had, of course, saturated the very fluid Celtic, Germanic, late Roman, and Merovingian societies; but it was the need for cavalry felt by the early Carolingians which precipitated and crystallized these anticipations to form medieval feudalism.

Finally, Brunner tried to discover what military necessity led to such sudden and drastic measures on Charles Martel's part. The northern enemies of the Frankish kingdom did not use cavalry extensively; the campaigns against the Avars were either too early or too late to account for the reform. But the Muslim invasion seemed to fit the evidence.¹ Brunner believed that the Saracenic horde was mounted. While their charges had broken against the glacial line of the shield-wall of the Frankish footmen at Poitiers, Martel had been unable quickly to follow up his victory by means of his slow-moving infantry. Therefore he determined to create an adequate mounted force to be financed by confiscation of ecclesiastical property. Thus, Brunner concluded, the crisis which generated feudalism, the event which explains its almost explosive² development towards the middle of the eighth century, was the Arab incursion.

Brunner's synthesis has been the focal point of all subsequent discussion of European feudal origins. It has stood up remarkably well against assaults from all directions.

The chief attack has come from military historians who deny that the second quarter of the eighth century witnessed any decisive change in methods of fighting. However, as a British scholar has remarked, their arguments 'are not a little bewildering, and seem to some extent mutually destructive'.³ One party holds that the transition from infantry to cavalry began with the disintegration of the Roman legion and was a centuries-long process which merely reached completion under Charlemagne.⁴ The opposite sect insists that the armies of Charlemagne were made up far less of cavalry than of infantry levies of Frankish freemen.⁵

This latter view may be correct as regards numbers: indeed, footmen were never eliminated from medieval armies. On the contrary, as mounted shock combat developed, they continued to be essential,

¹ This weakest link in Brunner's chain of hypotheses was suggested by M. Jähns, *Roß und Reiter* (Leipzig, 1872), II. 40.

² See p. 137.

³ H. A. Cronne, 'The origins of feudalism', *History*, xxiv (1939), 257.

⁴ See p. 137.

⁵ See p. 138.

particularly as archers.¹ But no evidence has been produced to undermine Brunner's conclusion that under the early Carolingians the striking force of the Frankish army came rapidly and increasingly to consist of mounted feudal knights. As the Aachen regulations of 807 show,² in theory Charlemagne's army was composed of two parts: first, the holders of benefices and their retainers; second, those who served as freemen, and not by reason of tenure. Charlemagne's edicts often mention the military service owed by all freemen, most of whom, for economic reasons, must have fought on foot. But we do not know to what extent such levies were actually called up for personal service in the army, whereas it is clear that Charlemagne did his best to extract some cavalry even from this class of poorer landowners by organizing them into groups according to the size of their holdings, each group to share the expenses of one fighter sent mounted to the muster.³ Since *jus* normally lags behind *factum*, one would not expect a shift of emphasis from infantry to cavalry under Martel to be reflected in any formal renunciation by his grandson of a right to service which rested on centuries of precedent and which might conceivably be useful upon occasion. As regards Charlemagne's practice, however, it may be significant that the only extant military summons sent by him to a magnate of his realm, that issued to Abbot Fulrad of Vermandois and Lobbes between 804 and 811, speaks in detail of horsemen but does not indicate that the abbot was expected to produce any footmen for war.⁴

Far more dangerous to Brunner's theories is the insistence, mentioned above, that the age of cavalry begins not in the eighth but in the fourth century, or even earlier. The battle of Adrianople (A.D. 378), in which the Germanic horse was decisive in defeating the Roman legionaries, has often been considered the turning-point in military history between ancient and medieval times. In the words of Sir Charles Oman: 'The Goth found that his stout lance and his good steed would carry him through the serried ranks of the Imperial infantry. He had become the arbiter of war, the lineal ancestor of all the knights of the Middle Ages, the inaugurator of that ascendancy of the horseman which was to endure for a thousand years.'⁵

Careful examination of the events at Adrianople does not confirm such generalization.⁶ It appears that no great portion of the Visigothic

¹ *Infra*, p. 149, n. 6.

² *Infra*, p. 30, n. 1.

³ *Infra*, p. 30, n. 1.

⁴ *MGH, Cap. i.* 168.

⁵ *MGH, Cap. i.* 134.

⁶ *Op. cit.* i. 14.

⁶ W. Judeich, 'Die Schlacht bei Adrianople', *Deutsche Zeitschrift für Geschichtswissen-*

host was mounted: although the Roman army was known to be near, the barbarian horse was on a foraging expedition when the Imperial forces marched to attack the German wagon fortress; moreover, the Romans drew up their line of battle in complete disregard of the possibility that the enemy cavalry might return to take part in the fray. One can only conclude that neither the Emperor Valens nor Fritigern, the Gothic commander, considered the horsemen an important element in the barbarian army. Valens arranged his infantry in the centre with cavalry on each wing. The right wing was to have opened the attack, but the infantry, irritable because of an 8-mile march in the August heat, impetuously opened the combat, thus destroying Valens's tactical plans. At just that moment the Gothic horsemen, recalled by Fritigern, appeared without warning and rushed upon the Roman right flank from the side or perhaps even from the rear, rolling it up in confusion. Then a portion of the German cavalry swung around the Roman rear to attack the Imperial left wing, and the process was repeated, while a horde of barbarian footmen poured from the circle of wagons shooting arrows and hurling javelins, as did the horsemen, into the crush of legionaries. Clearly, the catastrophe at Adrianople did not prove the superiority of cavalry over infantry. The Gothic horsemen routed the Romans, already confused by their own indiscipline, not because of superior strength, but rather by effecting a surprise attack which amounted almost to ambush.

The use of cavalry in the early Christian centuries demands much more careful investigation than it has received. Two contemporary developments somewhat increased the effectiveness of the mounted warrior. The more important was the saddle, which arrived in the West as a barbarian innovation in the first century after Christ,¹ and which gradually replaced the older horse-blanket and riding cushions. The saddle, with its rigid frame, although it did not add to a rider's lateral stability (a presupposition of mounted shock combat), nevertheless helped to prevent him from falling over his horse's tail. Secondly, a new type of mount, the heavy horse, ancestor of the

schaft, vi (1891), 1-21; F. Runkel, *Die Schlacht bei Adrianopel* (Rostock, 1903); G. Gundel, *Untersuchungen zur Taktik und Strategie der Germanen nach den antiken Quellen* (Marburg, 1937), 89, corrects Runkel's conclusion (37, 41) that the Visigothic horse struck the Roman left flank rather than the right.

¹ *Supra*, p. 1, n. 1, and W. Günther, 'Sattel', *Reallexikon der Vorgeschichte*, xi (1928), 214 and pl. 56c; F. M. Feldhaus, *Die Technik der Vorzeit* (Leipzig, 1914), 897; C. Daremberg and E. Saglio, *Dictionnaire des antiquités* (Paris, 1908), s.v. *sellu equestris*.

medieval destrier and of the draught horse, likewise appeared in the West during the first Christian century.¹ Such a beast could carry a heavily armed soldier and might even itself be armoured.

Probably it was the saddle and the heavy horse which had stimulated among Central Asian peoples earlier experiments in novel methods of cavalry warfare. Excavations near the Aral Sea have shown that in the sixth century before Christ the Massagets were developing a heavy cavalry, with fairly massive armour for both horses and riders, the latter being normally armed with bows, but sometimes with long lances.² From pictures³ we know that these lances were held in both hands at the charge, and Valerius Flaccus⁴ may indicate that the thrust was delivered by both man and mount. While no spear held at the end of the arms could have struck a blow comparable to that delivered by one held at rest under the upper arm, nevertheless for some circumstances the two-handed lance was an improvement over the one-handed spear: the evidence appears in pictures of two-handed lances equipped with pennons.⁵ The one-handed spear could not often impale an enemy deeply enough to make extraction of the blade difficult; the two-handed spear may occasionally have gone so deep as to resist withdrawal, thus disarming the successful warrior, to his own peril. The pennon, like the Mongol horsetail attached behind the blade of spears,⁶ was a device to prevent too deep penetration and ensure retraction.

But those who imagine that the Sarmatian *clibanarius* was the model for the medieval knight have overlooked two essential points, quite apart from the necessarily inferior impact of the two-handed lance as compared with the lance held at rest. In the first place the

¹ See p. 138.

² B. Rubin, 'Die Entstehung der Kataphraktenreiterei im Lichte der chorsmischen Ausgrabungen', *Historia*, iv (1955), 264-83. The conclusions of S. P. Tolstov are summarized by R. Girshman, 'La Chorasmie antique: essai de recherche historico-archéologique', *Artibus Asiae*, xvi (1953), 292-7.

³ e.g. from a tomb at Kerch of the first to second century A.D., in M. Rostovtzeff, *Iranians and Greeks in South Russia* (Oxford, 1922), pl. XXIX; *The Excavations at Dura-Europos*, ed. P. V. C. Baur, &c., Fourth season (New Haven, 1933), pls. XVII; XX. 3; XXII. 2; cf. XXII. 1 and pp. 217-21; and for a Korean instance, A. D. H. Bivar, in *Oriental Art*, i (1955), 63, also fig. 2.

⁴ *Argonautica*, vi. 236-7: 'fert abies obnixa genu vaditque virum vi, vadit equum'; ed. J. H. Mozley (Cambridge, Mass., 1934), 319; cf. R. Syme, 'The *Argonautica* of Valerius Flaccus', *Classical Quarterly*, xxiii (1929), 129-37 for further discussion of the Sarmatian long lance.

⁵ H. Appeltgren-Kivalo, *Alt-altaische Kunstdenkmäler* (Helsinki, 1931), fig. 93.

⁶ W. Shelesnow, 'Roßchweife an Lanzen', *Zeitschrift für historische Waffenkunde*, ii (1900-2), 233-4; cf. *infra*, pp. 27-28.

two-handed lance compelled the warrior to lay the reins on his horse's neck and to guide him solely by voice and pressure of the knees at the most critical moments of battle. Particularly if the horse were wounded, this must have been extraordinarily dangerous. In contrast, the medieval knight, with lance at rest, held the reins in his left hand¹ at the charge, and by means of a powerful and cruel bit he exerted a maximum of control over his mount. In the second place, the two-handed lance could not be used in conjunction with a shield. This meant that while it was fairly effective against footmen, a battle between two groups of cavalry both armed with two-handed lances would amount to general suicide. To the knight of feudal Europe, the shield on his left arm was as important as the lance under his right arm. Between them they provided the balance between offence and defence which was essential to mounted shock combat and which is not found in the Central Asian experiments with the two-handed lance.²

What was going on in the heart of Asia doubtless stimulated the development, both in the Iranian and in the eastern Roman empires, of the heavy-armed cataphract, but as Procopius's famous description of these warriors shows, they were essentially armoured bowmen, equipped likewise with swords, small shields, and at times with light one-handed spears.³ However, thus far none of Brunner's critics has produced adequate evidence of any comparable increase of mounted warfare in the Germanic kingdoms of the West before the middle of the eighth century. The retinues and bodyguards of kings and of great chieftains were habitually mounted, but even this *élite* appears to have used the horse primarily for mobility and to have dismounted for combat.⁴

So much emphasis has been placed by Brunner's opponents⁵ on the importance of cavalry in the Visigothic kingdom, that we are

¹ The common derivation of *destrier* from the assumption that with this type of horse the reins were held in the right hand does not find support in any contemporary evidence.

² A sixth-seventh-century graffito from the lower Yenessei valley (*supra*, p. 8, n. 5) shows a *clibanarius*, without stirrups, equipped with a two-handed lance: from the stock of the lance a cord ending in a cross-piece runs through the rider's fingers to permit him to recover the lance when it falls. Such a device confirms the inadequacy of the two-handed lance for shock combat. In this graffito what appears to be a small circular shield is attached to the chest in lieu of a breastplate; it does not seem to hang from the neck.

³ *De bello Persico*, I. i; ed. and tr. H. B. Dewing (London, 1914), i. 6-8.

⁴ See p. 139.

⁵ Delbrück, *op. cit.* ii. 423; F. Kauffmann, *Deutsche Altertumskunde* (Munich, 1923), ii. 336; Mangoldt-Gaudlitz, *op. cit.* 15-18; E. Mayer, *op. cit.* 46; Dopsch, *op. cit.* ii. 297.

particularly fortunate to possess, from the pen of the eminent Spanish historian Claudio Sánchez-Albornoz, a more detailed study of the question than is available for any other area in that age. He concludes that while there is ample evidence of a continuing tradition of military horsemanship in Spain from Celtiberian times onward, nevertheless there is no basis for believing that cavalry was the major arm of the Visigothic host.¹

Brunner's hypothesis, then, has survived the attacks of military historians regarding the use of cavalry by the Franks. But students of the history of institutions likewise tried to refute him, particularly in the early 1930's, by insisting that the union of benefice and vassalage is far older than the eighth century, that the custom of requiring military service for the enjoyment of lands was not an innovation of the eighth century, and that, consequently, Charles Martel's secularization of Church lands played no decisive part in the development of feudalism.² However, the consensus in favour of Brunner eventually reached proportions rare in the world of scholars.³ As Carl Stephenson remarked: 'Whether the military benefice was or was not an eighth-century invention is a matter of secondary importance. Our chief interest is rather the wide extension of feudal tenure which came in the ensuing period.'⁴ Even Sánchez-Albornoz, who in his studies of Visigothic Spain has come closest to demonstrating an approximation of feudal relationships before the Carolingian era, is careful to call them 'proto-feudal' and to insist that the real development of such institutions came in the Frankish realm of the eighth century.⁵

¹ 'La caballeria visigoda', in *Wirtschaft und Kultur: Festschrift A. Dopsch* (Baden bei Wien, 1938), 106-8; *En torno a los orígenes del feudalismo* (Mendoza, 1942), iii. 100-1.

² Dopsch, *Grundlagen*, 2nd edn. ii. 293-343; 'Beneficialwesen und Feudalität', *Mitteilungen des Österreichischen Instituts für Geschichtsforschung*, xvi (1932), 1-36; 'Wirtschaft und Gesellschaft im frühen Mittelalter', *Tijdschrift voor rechtsgeschiedenis*, xi (1932), 387-90; F. Lot, *Destinées de l'empire*, 665; 'Origine et nature du bénéfice', *Anuario de historia del derecho español*, x (1933), 175-85.

³ The precursor of the present view was H. Voltolini, 'Prekarie und Beneficium', *Vierteljahrsschrift für Sozial- und Wirtschaftsgeschichte*, xvi (1923), 293-305. For later developments see particularly F. L. Ganshof, 'Note sur les origines de l'union du bénéfice avec la vasalité', *Études d'histoire dédiées à la mémoire de Henri Pirenne* (Brussels, 1937), 173-89; *Qu'est-ce que la féodalité?*, 2nd edn. (Neuchâtel, 1947), 30-34; 'L'Origine des rapports féodo-vassaliques', in *I problemi della civiltà carolingia: Settimane di studio del Centro Italiano di Studi sull'Alto Medioevo*, i (Spoleto, 1954), 27-53.

⁴ Op. cit. 807; cf. Cronne, op. cit. 259.

⁵ *En torno a los orígenes del feudalismo*, iii. 288-9; *El 'stipendium' hispano-godo y las orígenes del beneficio prefeudal* (Buenos Aires, 1947), 142-6; 'España y el feudalismo carolingio' in *I problemi della civiltà carolingia* (Spoleto, 1954), 110-45.

Nor has the effort been successful to show¹ that the quantity of clerical lands seized and distributed to vassals by the early Carolingians was comparatively small. Lesne² judges them to have been very large; and indeed, Brunner may have been too modest in asserting that the secularizations were less severe in Neustria than in Austria:³ vassals are found throughout Charlemagne's empire in considerable numbers.⁴ By about 745 both monasteries and bishoprics were receiving a *census* in partial compensation for lost estates.⁵ To carry through their great military reform, the early Carolingians needed vast tracts of lands. Their confiscations were so drastic as to redistribute a considerable portion of the wealth of their realm.

Thus we arrive once more at the crucial problem in the study of feudal origins: why did Charles Martel and his immediate successors brave the wrath of the Church by seizing ecclesiastical properties to endow cavalry? What military circumstance impelled them to disregard the peril of clerical censure, the dictates of conventional morality?

Brunner found his answer in the Saracenic invasion. He claimed that Martel realized that, despite the victory of Poitiers, the Franks would need an adequate cavalry to repel the mounted Muslim armies permanently.

But was the battle of Poitiers in fact so great a crisis? Were the Muslims considered by contemporaries to be the chief danger to the Frankish kingdom? One suspects that our present common judgement has been based less upon the records than upon the rhetoric with which Gibbon proposed to the horrified imagination of eighteenth-century agnostics the spectacle of an Oxford engrossed in perusing the Koran, and of a Europe habituated to circumcision, had Charles's hammer struck less resoundingly.⁶ Martel turned his attention to Islam only after he had consolidated his realm.⁷ The

¹ Meyer, op. cit. 66.

² *Sécularisations*, 29, 32.

³ *Deutsche Rechtsgeschichte*, 2nd edn. by Schwerin, 336, n. 29.

⁴ F. L. Ganshof, 'Benefice and vassalage in the age of Charlemagne', *Cambridge Historical Journal*, vi (1938), 170.

⁵ Mitteis, *Lehnrecht*, 117, n. 27; *MGH, Epp.* iii. 324; cf. *infra*, p. 29, n. 2.

⁶ *The History of the Decline and Fall of the Roman Empire*, ch. 52 (London, 1788).

⁷ C. H. Becker, *Islamstudien* (Leipzig, 1924), 123-6; cf. G. Lokys, *Die Kämpfe der Araber mit den Karolingern* (Heidelberg, 1906), 6. It has long been recognized that internal strife within Muslim Spain was more important than Martel's campaigns in forcing the Saracens to withdraw beyond the Pyrenees; cf. E. Mercier, 'La Bataille de Poitiers et les vraies causes du recul de l'invasion arabe', *Revue historique*, vii (1878), 1-13.

sole contemporary source connecting his military reforms with the Muslim incursions is Pope Zacharias's letter, already noted,¹ referring to the 'tribulatio Saracorum, Saxonum vel Fresonum'. The opinions of immediate posterity as to the relative importance of these three foes is shown by the fact that when, under Louis the Pious, the walls of the palace at Ingelheim were decorated with murals of the deeds of great rulers, Charles Martel was depicted not at Poitiers but rather conquering the Frisians.² Indeed, having defeated the Muslims, Martel made little effort for several years to follow up his victory. This would indicate that the Islamic invasion was not an adequate motive for the reorganization of Frankish society to secure cavalry.

Moreover, Brunner believed that the battle of Poitiers was fought in 732: not until 1955 did we learn that the correct date is 733.³ But the first seizures of Church properties for distribution to vassals occurred in fact in 732 when Charles Martel took lands of the Bishop of Orleans and others so that 'honores eorum quosdam propriis usibus annecteret, quosdam vero suis satellitibus cumularet'.⁴ Poitiers, therefore, cannot have inspired Charles's policy of confiscations for the improvement of his cavalry. His military reforms had begun a year earlier, although doubtless they had not yet greatly modified the structure of the Frankish forces when he met the Muslim invaders.

And finally, was Brunner correct in assuming that the Spanish Saracens at Poitiers were fighting chiefly on horseback? Certainly by the early ninth century the Franks thought of them as 'Mauri celeres . . . gens equo fidens'.⁵ But here again the exhaustive researches of Sánchez-Albornoz into the Arabic sources have clarified the matter. He has shown that even twenty years after Martel's death the Spanish Muslims used cavalry only in small numbers: it was not until the second half of the eighth century that they too shifted the weight of their armies from footmen to mounted fighters.⁶ Can it

¹ *Supra*, p. 4, n. 3.

² Ermoldus Nigellus, *In honorem Hludovici*, iv, l. 275; *MGH, Scriptores*, ii, 506.

³ *Supra*, p. 3, n. 3.

⁴ *Vita S. Eucherii episcopi Aurelianensis in Acta sanctorum*, Feb. iii (Antwerp, 1658), 218.

⁵ Ermoldus, op. cit. i, l. 147; *MGH, Scriptores*, ii, 469.

⁶ 'Los arabes y los orígenes del feudalismo', *Anuario de historia del derecho español*, x (1933), 517-18; 'Les Arabes et les origines de la féodalité', *Revue historique de droit français et étranger*, xii (1933), 219-20; *En torno a los orígenes del feudalismo, III: La caballería musulmana y la caballería franca del siglo VIII* (Mendoza, 1942), 253 ff. According to the very late evidence of al-Makkari (d. A.D. 1632), the first Umayyad

have been the Sons of the Prophet who imitated the Franks rather than the reverse? In any case it is now clear that the Muslim peril did not provoke Charles Martel's military reform and thus establish feudalism in Europe.

Only one alternative explanation of the seizure and distribution of the Church lands has been widely discussed. Roloff¹ suggests that the great *Major palatii*, himself a bastard and usurper, was trying to strengthen his political situation by largesse which would attract to his retinue most of the magnates of the realm. But Mangoldt-Gaudlitz² cogently objects, first, that such drastic action, while undoubtedly it would build up Charles's secular following, would likewise risk the dangerous enmity of the Church, the one authority which might consent—and eventually did consent—to legitimize the rule of his dynasty; second, that Martel, an experienced warrior—Isidorus Pacensis calls him 'ab ineunte aetate belligerum et rei militaris expertum'³—would more probably be moved by military than by political considerations; and third, that the political situation of Martel's sons Carloman and Pipin was so firm that their immense new confiscations of clerical estates can best be explained on military grounds. But if, unlike Mangoldt-Gaudlitz, we cannot accept Brunner's hypothesis of the Muslim invasion, what military development or crisis in the 730's is adequate to account for such momentous events?

The whole of Brunner's magnificent structure of hypotheses stands, save its keystone. We are faced, in the reigns of Martel, Carloman, and Pipin, with an extraordinary drama which lacks motivation. A sudden and urgent demand for cavalry led the early Carolingians to reorganize their realm along feudal lines to enable it to support mounted fighters in much greater numbers than ever before. Yet the nature of the military exigency which brought about this social revolution has eluded us.

The answer to the puzzle is to be found not in the documents but in archaeology. It was first offered in 1923, at the end of a rambling footnote, by a master of Germanic antiquities. Speaking of the social cleavages which resulted when the new and expensive method of fighting on horseback led to the growth of a specialized aristocracy of mounted warriors, Friedrich Kaufmann remarked, almost as an

Caliph of Spain (d. A.D. 788) was served by a chief groom entitled Master of the Stirrup, *sāhib al-rikāb*; cf. *Encycl. Islam*, iii, 1160.

¹ Op. cit. 398.

² Op. cit. 29.

³ *Infra*, p. 136.

afterthought: 'The new age is heralded in the eighth century by excavations of stirrups.'¹

II

The Origin and Diffusion of the Stirrup

A priori speculation about the origin of the stirrup is reduced to absurdity by von Le Coq² who proposes that it may have been invented either by a race of habitual horsemen (e.g. the Turkomens) or else by a sedentary agricultural people (e.g. the Chinese) suddenly forced to learn to ride in order to protect itself against nomadic raids. Clearly, nothing is to be gained by imaginative excursions.

The Assyrian bronze doors, now in the British Museum, which illustrate an expedition of Shalmanaser III in 853 B.C., show the king on horseback with his feet resting on what appear to be long flat foot-boards suspended from the saddle-pad.³ These are entirely isolated specimens which do not mark the beginnings of the stirrup.

Indeed, stirrups were unknown not only to the ancient Near East but to the Greeks and Romans as well. Literature is silent about them; the innumerable antique representations of riders lack them;⁴ and the objects presented by archaeologists as classical stirrups are either of doubtful identification or of questionable provenance.⁵ Towards the end of the fourth century Vegetius, the last classical author to leave us a discussion of mounting horses, says nothing of them.⁶

The rudimentary idea of the stirrup appeared in India in the late second century before Christ, as shown in sculpture at Sanchi, Pathaora, Bhaja, and Mathura: a loose surcingle behind which the rider's feet were tucked, and later a tiny stirrup for the big toe alone.⁷

¹ See p. 139.

² A. von Le Coq, *Bilderatlas zur Kunst- und Kulturgeschichte Mittelasiens* (Berlin, 1925), 22.

³ L. W. King, *Bronze Reliefs from the Gates of Shalmanaser, King of Assyria* (London, 1915), pl. LVIII; A. D. H. Bivar, 'The stirrup and its origins', *Oriental Art*, new series, i (1955), 63, fig. 3; for the date, A. T. Olmstead, *History of Assyria* (New York, 1923), 116; cf. E. Unger, 'Steigbügel (Vorderasien)' in *Reallexikon der Vorgeschichte*, ed. M. Ebert, xii (1928), 392.

⁴ See p. 139.

⁵ E. Espérandieu, 'Note sur un étrier gallo-romain', *Pro Alesia*, i (1906), 17-18; H. Jacobi, 'Hatten die Römer Steigbügel?' *Germania*, vi (1922), 88-93. E. E. Viollet-le-Duc, *Dictionnaire du mobilier français*, v. 413, reports two Roman stirrups as being preserved in the Museum at Naples; but A. Schlieben, 'Geschichte der Steigbügel', *Annalen des Vereins für Nassauische Altertumskunde und Geschichtsforschung*, xxiv (1892), 187, ascertained that the Naples Museum contains no such objects.

⁶ *De re militari*, i, c. 18.

⁷ See p. 140.

Since the big-toe stirrup could not be used by shod riders, its diffusion was blocked towards the colder climates of the north. A Kushan engraved gem, now in the British Museum and datable c. A.D. 100, shows a booted rider with feet supported by what appear to be rigid hooks suspended from the saddle (Fig. 1).¹ Since such hooks might easily drag a fallen rider, the experiment can scarcely have proved satisfactory, but it demonstrates the efforts of the peoples of northern Pakistan and Afghanistan to adapt the big-toe stirrup to their needs.

The foot-stirrup presumably is a Chinese invention. It appears in China as a result of the great wave of Buddhist missionary activity which swept through Afghanistan and Turkestan to the Middle Kingdom, carrying so many elements of Indic culture.² It was known in Hunan by the first decades of the fifth century at latest, and the earliest mention of the stirrup in Chinese literature, in A.D. 477, indicates that it was then in common use.³ Chinese representations of stirrups are extant from A.D. 523,⁴ 529,⁵ 551,⁶ 554,⁷ 636,⁸ and 683,⁹

¹ British Museum, no. 1919, 7-9, 02. I am grateful to Mrs. James Caldwell of Mills College and to Dr. Douglas Barrett, Assistant Keeper of Oriental Antiquities of the British Museum, for securing the photograph, and to Dr. John Rosenfield of Harvard University for confirming Dr. Barrett's dating. Lefebvre des Noettes, op. cit., fig. 263, and A. L. Basham, *The Wonder that was India* (London, 1954), 374, fig. XXIII, show a copper vase from Kulū, on the borders of Kashmir, supposedly of the first-second century after Christ, depicting a loose surcingle supporting the rider's feet. Dr. Barrett informs me by letter that he is not entirely convinced of the authenticity of this vase, which is in the British Museum.

² Cf. Hu Shih, 'The Indianization of China: a case study in cultural borrowing', *Independence, Convergence and Borrowing* (Cambridge, Mass., 1937), 219-47.

³ See p. 140.

⁴ Stele in Royal Ontario Museum, Toronto.

⁵ Stele in Boston Museum of Fine Arts; cf. O. Sirén, *Chinese Sculpture from the Fifth to the Fourteenth Centuries* (New York, 1925), pls. 109-11. In 1939 I examined stirrups on a companion stele of the same date from the collection of C. T. Loo, then exhibited in San Francisco.

⁶ Stele in Chicago Art Institute; cf. C. F. Kelley, *A Chinese Buddhist Stele of the Wei Dynasty* (Chicago, 1927), pl. 6.

⁷ Boston Museum; cf. Sirén, op. cit., pl. 172; E. Chavannes, *Six monuments de la sculpture chinoise* (Brussels, 1914), pl. XL; L. Ashton, *Introduction to the Study of Chinese Sculpture* (London, 1924), pl. 56.

⁸ University of Pennsylvania Museum; cf. E. Chavannes, *Mission archéologique dans la Chine septentrionale* (Paris, 1913), pls. 288-9; Sirén, op. cit., pls. 426-7b, and *History of Early Chinese Art: Sculpture* (London, 1930), pl. 93; Ashton, op. cit., pl. 47; H. E. Fernald, 'The horses of T'ang T'ai Tsung and the stele of Yu', *Journal of the American Oriental Society*, lv (1935), 420-8. O. Maenchen-Helfen, 'Crenelated mane and scabbard slide', *Central Asiatic Journal*, iii (1957), 120, believes that these trappings are Turkish in form.

⁹ Chavannes, *Mission*, pl. 294; Sirén, *Chinese Sculpture*, pl. 430, and *Early Chinese Art*, pl. 94b.

while others which cannot be so exactly dated may be ascribed to the same period.¹ From China the stirrup spread to Korea by the fifth century,² and to Japan where it was known by the middle of the sixth century at latest.³

The efforts of Rostovtzeff⁴ and Arendt⁵ to endow the ancient Sarmatians or Scythians with stirrups are groundless. Yet since we know that by the fifth century of our era the idea of the stirrup had spread from India through the Khyber Pass to China along the ancient road of the silk trade, we might assume that some of the Central Asian peoples would have begun to use it. The Russian archaeologist S. V. Kiselev has recently placed in the sixth century certain stirrups from Turkish tombs of the Altai.⁶

However, the dating of nomadic tumuli is a marvellously delicate business. Graves lying side by side may have been dug centuries apart, and evidence from one cannot be used to date its neighbour. In times of crisis an old tomb occasionally received a second occu-

¹ Cf. *Pantheon*, iii (1929), 85; Laufer, *Chinese Clay Figures* (Chicago, 1914), pls. 71-72; C. Hentze, *Chinese Tomb Figures* (London, 1928), pls. 78-80, 84-85; *London Times*, 27 Mar. 1947, p. 6.

² S. Umehara, 'Deux grandes découvertes archéologiques en Corée', *Revue des arts asiatiques*, iii (1926), 33 and pl. XVII; A. Eckhardt, *History of Korean Art* (London, 1929), figs. 253, 361; H. Ikéuchi and S. Umehara in *T'ung-kou*, ii (1940), pls. IX, X, XIII, and p. 9; J. Werner, 'Beiträge zur Archäologie des Attila-Reiches', *Abhandlungen der Bayerischen Akademie der Wissenschaften, Phil.-hist. Kl.*, xxxviii (1956), pl. 67. 1.

³ W. G. Ashton, 'Nihongi: Chronicles of Japan from the earliest times to A.D. 697', *Transactions and Proceedings of the Japan Society, London*, supplement i (1896), 357; E. Baelz, 'Zur Vor- und Urgeschichte Japans', *Zeitschrift für Ethnologie*, xxxix (1907), 308, fig. 15; N. Tsuda, *Handbook of Japanese Art*, 2nd edn. (Tokyo, 1936), 15, 17, fig. 12; A. Münsterberg, *Japanische Kunstgeschichte* (Brunswick, 1904), ii, fig. 118, no. 1. The oldest extant stirrups to which an exact date can be given (A.D. 752) are preserved in the Shōsōin at Nara; cf. J. Harada, *English Catalogue of Treasures in the Imperial Repository Shōsōin* (Tokyo, 1932), nos. 349-52, and pl. XLV.

⁴ N. Vesselovsky orally assured Rostovtzeff that he had excavated stirrups from Sarmatian graves in the Kuban region, but Rostovtzeff did not see these discoveries, nor were they ever published, despite their obvious interest; cf. M. Rostovtzeff, *Iransians and Greeks in South Russia* (Oxford, 1922), 130; *The Animal Style in South Russia and China* (Princeton, 1929), 107, n. 2; *Skythien und der Bosphorus* (Berlin, 1931), i, 558, n. 1; cf. M. Ebert in *Reallexikon der Vorgeschichte*, xiii (1928), 110, and P. Pelliot in *T'oung pao*, xxiv (1926), 262, n. 2.

⁵ See p. 141.
⁶ His conclusions are summarized by R. Ghirshman in *Artibus Asiae*, xiv (1951), 184 and A. D. H. Bivar, op. cit. 65. As this book goes to press, Dr. O. Maenchen-Helfen of the University of California at Berkeley informs me that L. R. Kyzlasov, *Tashtykaya epokha* (Moscow, 1960), 140, fig. 51. 9-10, announces the discovery in Siberia of miniature iron stirrups which can scarcely be later than the third century after Christ and some of which appear to go back to the first or second century. Since other miniature objects are found in the same cultures, these are probably not big-toe stirrups, which in any case would be useless in such a climate.

pant, to the archaeologist's confusion. And burial, with the dead, of heirlooms which may have been treasured for generations, complicates the effort to date all but rich graves by means of coins or objects of art. The cautious Teploukhov, after ten years of labour on the stratification of culture in the Minusinsk basin, in contrast to Kiselev, could not find the stirrup there earlier than the seventh century.¹ The numerous stirrups at Saltovo, in the Ukraine, are not earlier than the eighth century,² while those found at Laida, near Tambov,³ and at Pereslav,⁴ are of about the same age. The earliest Central Asian picture of a stirrup, in a rock-scratching from the Altai, is indecisive since it is probably not earlier than A.D. 400 and not later than A.D. 700.⁵

Our opinion about the dating of the use of stirrups by the nomadic horse-men may be influenced by the fact that Iran, with all of its Central Asian connexions, was not familiar with the stirrup until the end of the seventh century. This lack is the more curious because in the third and fourth centuries the Sassanids conquered and ruled considerable areas of the present Afghanistan and Pakistan⁶ which presumably then had some form of hook-stirrup. But the many and detailed Sassanian representations of horse-trappings show not a single pair of stirrups: the famous bestirrupped silver plate in the Hermitage is now judged to be post-Sassanian, probably from the regions north of Iran, and to date from about A.D. 700 or even later.⁷ Unfortunately, the Muslim aversion towards depicting men and animals descended on Iran in A.D. 641 and deprived us of visual

¹ S. A. Teploukhov, 'Essai de classification des anciennes civilisations métalliques de la région de Minoussinsk', *Materialy po etnografii Rossii*, iv (1929), 57, 62; cf. *American Anthropologist*, xxxv (1933), 321. A. Spitsyn, in establishing an archaeological stratification for the Kama region, produced no stirrup before the tenth century; *Materialy po archeologii Rossii*, xxvi (1902), pl. xxv. 20 and p. 63; cf. A. A. Zakharov, *Studia levedica* (Budapest, 1935), 39. However, this may be overly conservative; cf. A. Marosi and N. Fettich, *Trouvailles avares de Dunapentele* (Budapest, 1936), 87.

² Zakharov, op. cit. 40.

³ *Materialy po archeologii Rossii*, x (1893), pl. x. 1; cf. Zakharov, op. cit. 39.

⁴ J. R. Aspelin, *Antiquités du nord finno-ougrien* (Helsinki, 1878), 210.

⁵ H. Appelgren-Kivalo, *Alt-altaische Kunstdenkmäler* (Helsinki, 1931), fig. 80. I owe the dating to O. Maenchen-Helfen of the University of California at Berkeley. Pictures of stirrups from Chinese Turkestan of the eighth to tenth centuries are found in A. Grünwedel, *Alt-buddhistische Kulturstätten in Chinesisch-Turkestan* (Berlin, 1912), fig. 513, and *Alt-Kutscha* (Berlin, 1920), i, fig. 54; A. von Le Coq, *Bilderatlas*, figs. 69, 70, 132, 134, and p. 22; A. Stein, *Preliminary Report of a Journey of Archaeological and Topographical Exploration in Chinese Turkestan* (London, 1901), pl. 2d, and *Ancient Khotan* (Oxford, 1907), ii, pl. 59.

⁶ Cf. A. Banerji, 'Side-lights on the later Kuṣānas', *Indian Historical Quarterly*, xiii (1937), 105-16.

⁷ See p. 141.

records for many generations thereafter. Philology and literature, however, offer pertinent evidence.

Pelliot has pointed out¹ that since the Persians use the Arabic word *rikāb* for stirrup, the stirrup probably reached Persia in the later seventh or early eighth centuries when the ruling and fighting class in Iran was Arabic-speaking.

Two ninth-century recorders of the *Hadith*, Abu-Dāwūd (d. A.D. 888) and al-Tirmidhi (d. A.D. 883-93) wrote down the following tradition which was circulating in Persia: 'I have seen 'Ali (d. A.D. 661) bring forth a mount in order to ride. When he placed his foot in the *rikāb* he said "In the name of God" three times.'² More than 200 years of oral transmissions had intervened, and that 'Ali ever used a *rikāb* is rendered doubtful by the fact that observant Muslim authors have left us an exact and consistent account of the stirrup's introduction, at least in metallic form, thirty-three years after 'Ali's assassination. Al-Jāhiz (d. A.D. 868) describes the current contempt of the native Persian Shū'ūbiyah for the Arabs. The former said to the Arabs: 'You were accustomed to ride your horses in battle bareback, and whenever a horse did have a saddle on its back it was made of leather but had no stirrups. But stirrups are among the best trappings of war for both the lancer who wields his spear and the swordsman who brandishes his sword, since they may stand in them or use them as support.' To which al-Jāhiz replies: 'As to stirrups, it is agreed that they are very old, but iron stirrups were not used by the Arabs before the days of the Azraqites.'³

The reference to the sect of the Azraqites is clarified by a passage from the writings of another ninth-century author al-Mubarrad (d. A.D. 898) who tells us that 'stirrups were first made of wood and therefore broke very easily, with the result that whenever [the warrior] wished to brandish his sword, or the lancer to strike with his spear, he had no support. Consequently al-Muhallab ordered that they be made of iron. He thus became the first to have stirrups made of iron'.⁴ In A.D. 694 the general al-Muhallab⁵ was campaigning

¹ *T'oung pao*, xxiv (1926), 262, n. 1.

² Abu-Dāwūd, *Jihād*, 74; al-Tirmidhi, *Da'awat*, 46; cf. *Encycl. Islam*, i. 82; iv. 796. I am indebted to Dr. N. H. Faris of the University of Beirut for translation of these texts.

³ Al-Jāhiz, *al-Bayān w-al-Tabayn* (Cairo, 1926-27), iii. 8, 12; cf. *Encycl. Islam*, i. 1000.

⁴ See p. 142.

⁵ S. M. Yūsuf, 'Al-Muhallab-Bin-Abī-Sufra: his strategy and qualities of generalship', *Islamic Culture*, xvii (1943), 2, significantly credits al-Muhallab not only with introducing iron stirrups but also with copying the Turkish habit of cropping the tails of horses.

against the Azraqites in central Persia, and it would appear from our sources that he borrowed stirrups, or at least iron stirrups, from his adversaries at that time.

What shall we think of the insistence of both al-Jāhiz and al-Mubarrad that wooden or leather stirrups considerably antedated iron stirrups? Such a view still pervades the literature on the history of horsemanship,¹ but it is merely logical or schematic, and has no adequate basis either in archaeology or in the extant representations of horse-trappings. Like hook-stirrups, rope and leather stirrups may drag a rider who has lost his seat. Unless they were stoutly reinforced, wooden stirrups made by techniques available to the ancients would have been insufficiently strong. It is as hard to believe that metalworking peoples would for long or generally use rope, leather, or wooden stirrups without making the substitution of bronze or iron as it would be to hold that non-metallic stirrups never existed merely because they have not survived to be excavated. The Persian opponents of al-Jāhiz were probably quite correct in the essential fact: the Arabs entered Iran without the stirrup for their horses. We may conclude that the Muslims first appropriated it in A.D. 694 in Persia, whither it must recently have come from Turkestan, since it had been unknown in the Sassanian realm.

Incidentally, it is likely that the first Indian form of foot support for a rider, the loose surcingle (which could be used by a sandal-wearing aristocracy), reached Arabia earlier than the foot-stirrup, and was applied to camels under the name *gharz*.² After the *rikāb* or foot-stirrup was introduced, this latter was, at times, used with both the Bactrian camel and the dromedary,³ and the *gharz* became obsolete. To judge by modern evidence, the second phase of the Hindu stirrup, the big-toe stirrup, spread wherever ancient India had contact with peoples whose ruling classes were habitually barefoot: on the east as far as Timor⁴ and the Philippines,⁵ and on the west to Ethiopia.⁶ Since the region of the Upper Nile had close contact with India during Roman times,⁷ we must ask whether the stirrup in any form may have reached Egypt from Ethiopia.

¹ See p. 142.

² See p. 143.

³ M. A. Stein, *Ancient Khotan* (Oxford, 1907), ii, pl. II; E. Schroeder, *Persian Miniatures in the Fogg Museum of Art* (Cambridge, Mass., 1942), pl. VII and p. 49.

⁴ Schlieben, op. cit. 198.

⁵ J. Montano, 'Reise auf den Philippinen', *Globus*, xlvi (1884), 36.

⁶ M. Parkyns, *Life in Abyssinia* (New York, 1856), ii. 30; S. W. Baker, *Exploration of the Nile Tributaries of Abyssinia* (Hartford, 1868), 263.

⁷ Cf. J. Halévy, 'Traces d'influences indo-parsie en Abyssinie', *Revue sémitique*, iv

Negative evidence is, first, that no ancient Ethiopian word for stirrup is known, and that all modern words of the region derive from the Arabic *rikāb*;¹ second, that no trace of a stirrup has turned up among the numerous horse-trappings in the royal tombs of Lower Nubia from the third to the sixth centuries;² third, that no Coptic representations of stirrups can be dated with any assurance earlier than the ivories on the pulpit at Aachen, carvings which, after much dispute, are now firmly dated somewhat before 750.³ One must conclude that the stirrup was diffused to the West through Central Asia.

In view of the constant contact of the Byzantines with the peoples of the steppes and the considerable influence of these latter upon Byzantine military methods,⁴ it is probable that Constantinople received the stirrup shortly after it spread across the great plains of Asia to the region north of the Black Sea. The first Byzantine indication of it appears in a *Strategikon* traditionally ascribed to the Emperor Maurice (582-602), which twice speaks of 'iron stirrups'.⁵ Even if the attribution of this military treatise had never been challenged on other grounds, the evidence of the introduction of the stirrup to Iran would make us suspicious of it. Considering the perpetual struggles of the Eastern Empire first with the Sassanians and then with the Caliphate, is it imaginable that these latter would have remained ignorant of the stirrup for a century if in fact it had been standard equipment for the Byzantine cataphract since about 600? In neglect of the archaeological and Islamic data relevant to the stirrup, the battle over the dating of this *Strategikon* has been waged almost entirely in the field of philology; nevertheless, a respectable body of scholarship places the Pseudo-Maurice not in the late sixth

(1896), 258-65; E. Littmann, 'Indien und Abessinien', *Beiträge zur Literaturwissenschaft und Geistesgeschichte Indiens: Festgabe H. Jacobi* (Bonn, 1926), 406-17; E. H. Warmington, *The Commerce between the Roman Empire and India* (Cambridge, 1928), 13; A. J. Arkell, 'Meroe and India', in *Aspects of Archaeology*, ed. W. F. Grimes (London, 1951), 32-38, and his *History of the Sudan* (London, 1955), 166, figs. 20, 21; for gymnosophists in Ethiopia, cf. J. Filliozat, 'Les Échanges de l'Inde et de l'empire romain aux premiers siècles de l'ère chrétienne', *Revue historique*, cci (1949), 1-29.

¹ According to Dr. Wolf Leslau of the University of California, Los Angeles.

² W. B. Emery, *The Royal Tombs of Bullana and Qustal* (Cairo, 1938), i, 251-71; ii, pls. 55-56. Sudanese frescoes shortly after A.D. 1000 show curious uncertainty about how foot-stirrups should be attached to the rest of a horse's harness; cf. L. Griffith, 'The church of Abd el-Gādir near the Second Cataract', *Annals of Archaeology and Anthropology*, xv (1928), pls. XXXV and XLIII.

³ See p. 143.

⁴ Cf. E. Darko, 'Influences touraniennes sur l'évolution de l'art militaire des Grecs, des Romains et des Byzantins', *Byzantion*, x (1935), 443-69, xii (1937), 119-47, and 'Le Rôle des peuples nomades cavaliers dans la transformation de l'Empire romain aux premiers siècles du moyen âge', *ibid.* xviii (1946-8), 85-97.

⁵ See p. 144.

but rather in the early eighth century¹—a period more consonant with all else that we know about the diffusion of the stirrup.

In the controversy over the *Strategikon*, whenever stirrups are mentioned it is assumed that the Byzantines had got them from the Avars who, in turn, are assumed to have brought them from Central Asia when they first invaded Pannonia in 568. Despite prodigious labours by Hungarian archaeologists,² the stratification of Avar materials is not yet clear. 'Avar' finds are scattered chronologically from the later sixth century to the Magyar invasion more than 300 years later. The Avars were constantly receiving and assimilating ethnic strains and cultural influences.³ They, or the neighbouring Kuturgur Bulgars, may well have been the first people of Europe to use the stirrup, but the time of its arrival is still uncertain. The widespread belief that the Avars of the late sixth century had stirrups seems to rest on the great authority of Hampel, who insisted that they were 'well dated' in the excavations of Szent-Endre.⁴ Yet the Szent-Endre grave which loomed largest in his thinking, because it contained both stirrups and coins, cannot be sixth-century: the coins are not only of Justin I (518-27) but also of Phocas (602-10),⁵ and in any case they provide no more than a *terminus a quo*. Moreover, Werner has noticed⁶ that this particular grave is singularly indecisive because it was either a double grave or else was later disturbed by a second burial. It cannot, therefore, even be used, as Csallány has attempted,⁷ to prove that the Avars possessed the stirrup by the decade 620-30.

The difficulty which dating the arrival of the stirrup among the Avars has caused to archaeologists is illustrated by Kovrig's argument that the cemetery at Jutas developed in such a direction that two graves containing stirrups probably antedate a grave containing

¹ See p. 144.

² For systematization of bibliography and sites, but not of chronology, see D. Csallány, *Archäologische Denkmäler der Awarenzeit in Mitteleuropa: Schrifttum und Fundorte* (Budapest, 1956).

³ Cf. J. Eisner, 'Pour dater la civilisation "avare"', *Byzantino-slavica*, ix (1947), 45-54.

⁴ J. Hampel, *Altertümer des frühen Mittelalters in Ungarn* (Brunswick, 1905), i, 217, 223.

⁵ L. Huszár, 'Das Münzmaterial in den Funden der Völkerwanderungszeit im mittleren Donaubecken', *Acta archaeologica* (Budapest), v (1954), 96; Csallány, *Denkmäler*, 240.

⁶ J. Werner, *Münzdatierte austrasische Grabfunde* (Berlin, 1935), 73. G. László, 'Études archéologiques sur l'histoire de la société des Avars', *Archaeologia hungarica*, xxxiv (1955), 270, is likewise puzzled because this grave contained three stirrups!

⁷ D. Csallány, 'Grabfunde der Frühawarenzeit', *Folia archaeologica*, i (1939), 171.

a coin of Phocas (602-10).¹ But this coin may have been buried either a few years or a few generations after it was struck. The belief, fathered by Hampel, in sixth-century Avar stirrups seems to be dead among Hungarian scholars, and the tendency is to push the arrival of the stirrup in the Danubian basin later and later into the seventh century.² In any case, Avar stirrups can no longer be used to buttress a late sixth-century date for the Pseudo-Maurice's *Strategikon*.

A variety of stirrups has been found in East Prussia and Lithuania. O. Kleemann has claimed as the earliest, perhaps as early as any in Europe, those discovered in graves 8, 9, 12, and 6/38 at Elenskrug-Forst. He places them in the first half of the seventh century on the basis of related ceramics and especially of a late form of fibula.³ For the dating of a technological item which may have been introduced as a novelty while the necropolis was still being used for burials, one must consider the individual interments rather than the cemetery as a whole. Graves 9 and 12 had insufficient material, in addition to the stirrups, to permit close dating. Grave 8 contained a vase typical not only of the seventh but also of the eighth century.⁴ Grave 6/38 had a similar vase and a pair of fibulae of a fully evolved type which Åberg ascribes not to the first half but rather to the middle of the seventh century.⁵ Moreover, at the time of burial these fibulae were not new: one of them had been carefully mended after breakage.⁶ A late seventh- or early eighth-century date would therefore be preferable for the stirrups of Elenskrug-Forst.

¹ J. Kovrig, 'Contribution au problème de l'occupation de la Hongrie par les Avars', *Acta archaeologica* (Budapest), vi (1955), 175.

² In his incidental datings of 1090 Avar sites, Csallány, *Denkmäler*, 77-220, makes no claim for sixth-century stirrups. He believes that seventh-century stirrups have been found at Baja (no. 45), Bácsújfalú (no. 60), Komárom (no. 518), Linz-St. Peter (no. 566), Pereg (no. 759), and Szegvár (no. 870a). To this may be added a grave containing a stirrup which J. Kovrig, 'Deux tombes avars de Törökbalint', *Acta archaeologica* (Budapest), ix (1957), 131-3, dates in the early seventh century. It should be noted that Kovrig tends to date objects earlier than does Csallány; cf. Kovrig, 'Contribution', 184, who objects to Csallány's placing the Bácsújfalú stirrups c. 640; cf. Csallány, 'Trouvaille d'objets incinérés de l'époque avar à Bácsújfalú', *Archaeologiai értesítő*, lxxx (1953), 140-1.

³ O. Kleemann, 'Samländische Funde und die Frage der ältesten Steigbügel in Europa', *Rheinische Forschungen zur Vorgeschichte*, v (1956), 116. Kleemann, 117, rightly regards as very doubtful the sixth-century dating of a stirrup found at Hofzumberge near Mitau; cf. H. Moora, *Die Eisenzeit in Lettland*, i (Dorpat, 1929), 57; ii (1938), 529.

⁴ Kleemann, *op. cit.*, pl. xxxi, g; for date, cf. O. Tischler, *Ostpreussische Altertümer aus der Zeit der großen Grabfelder* (Königsberg, 1902), pl. 30. 1.

⁵ N. Åberg, *Ostpreußen in der Völkerwanderungszeit* (Uppsala, 1919), 126-7, fig. 182.

⁶ Kleemann, *op. cit.*, pl. xxxii, b.

If the Avars had brought the stirrup with them from Central Asia, one would have expected the Lombards to be the first Germanic people to receive it, since they were thrust from Pannonia into Italy by the impact of the Avar invasion of 568.¹ The Lombards had become sufficiently Christianized to omit horses from the burials of their warriors, but occasionally, perhaps touched by some pagan doubt, they included bridles and even saddles in the graves. None of these saddles was equipped with stirrups. Nor can the absence of stirrups be blamed on rusting: iron bits and weapons survive in the graves holding saddle ornaments. Grave 119 at Castel Trosino is particularly important, since it contained fragments of Avar armour, an iron bit, remains of a saddle, spurs, but no stirrups.² The only known Lombard stirrups, a very handsome bronze pair, emerged from Castel Trosino grave 41; they had been placed by sorrowing parents in the tomb of an infant girl who presumably had developed a childish liking for them. If we may judge by its location, grave 41 was one of the most recent in the cemetery, and therefore probably of the eighth century.³

For the Merovingian period, literary sources are silent about stirrups.⁴ Nevertheless, Veeck in 1931,⁵ followed by Müller-Karpe in 1949,⁶ asserted on archaeological grounds that the Germans received the stirrup in the later seventh century, finds of this period being claimed from Andelfingen, Oetlingen, and Pfahlheim in Württemberg, and from Budenheim near Mainz.

Lindenschmidt, who published the Budenheim stirrup, was reluctant to date it more exactly than 'Frankish',⁷ and there is no adequate reason for altering his judgement. Neither Veeck's inventory of the finds at Andelfingen, nor his source, mentions stirrups.⁸ The cemetery at Oetlingen was in use during the period of the introduction of the stirrup: from one grave an iron spur and bit emerged, but

¹ Cf. I. Bóna, 'Die Langobarden in Ungarn', *Acta archaeologica* (Budapest), vii (1956), 183-242.

² See p. 145.

³ Mengarelli, *op. cit.* 239, fig. 100; for dates of the cemetery as a whole, cf. *ibid.* 186; for the probable dating of grave 41, *ibid.* 187 and its location next to the church of Santo Stefano on pl. II.

⁴ See p. 145.

⁵ W. Veeck, *Die Alemannen in Württemberg* (Berlin, 1931), i, 75.

⁶ H. Müller-Karpe, *Hessische Funde von der Altsteinzeit bis zum frühen Mittelalter* (Marburg, 1949), 62.

⁷ *Westdeutsche Zeitschrift für Geschichte und Kunst*, xxi (1902), 433, pl. 11, n. 12.

⁸ Veeck, *op. cit.* 335; Reuß, 'Bericht über die Funde aus einigen "celtischen" Grabhügeln bei Hailtingen und einem "romanischen" bei Andelfingen', *Verhandlungen des Vereins für Kunst und Alterthum in Ulm und Oberschwaben*, ix-x (1855 [not 1858]), 90.

no stirrups; in a neighbouring grave stirrups were found.¹ The Pfahlheim cemetery is richer, and covers the same period: of seven horse-burials, only one—doubtless the latest—included stirrups.² Evidence that the Germans of this region did not have stirrups in the second half of the seventh century is provided by their absence from the very complete horse equipment coming from the grave of an Alemanic chieftain of that period found in Alsace.³ Presumably both at Oetlingen and at Pfahlheim horse-burials with warriors continued until the Alemans were effectively Christianized, that is, until the 730's.⁴

We must therefore return to the view of the older Germanic archaeologists that stirrups first appeared in the West some time in the early eighth century.⁵ In addition to the Oetlingen and Pfahlheim stirrups, finds of this period have come from Wilflingen⁶ and perhaps Gammartingen-Simaringen,⁷ both in Württemberg, from Windecken in Hesse,⁸ and perhaps from Bingen on the Rhine.⁹ Thereafter the labours of St. Boniface and his tonsured evangelists to persuade the heathen Germans that the gates of heaven exclude imports¹⁰ banished horse-burials to the still unregenerate Scandinavian north.¹¹

Neither in Byzantium nor in the West does art provide us with significant material on the diffusion of the stirrup. Throughout the early Middle Ages the artists of all Christendom, with rare exceptions, were little concerned with depicting the observable objects of the world around them. Naturalism had small place in the conscious methods of the craftsmen of that day—they were dedicated to elaborating traditional, and often inherited classical, patterns having

¹ Veeck, op. cit. 329.

² Ibid. 165-8.

³ J. Werner, *Der Fund von Ittenheim: ein alamannisches Fürstengrab des 7. Jahrhunderts im Elsaß* (Strassburg, 1943), 12, fig. 4; 29.

⁴ Veeck, op. cit. 112.

⁵ e.g. L. Lindenschmidt, *Handbuch der deutschen Alterthumskunde I: Die Alterthümer der merovingischen Zeit* (Brunswick, 1880), 288; J. Hampel, op. cit. i. 217; É. Salin and A. France-Lanord, *Rhin et Orient, II: Le Fer à l'époque mérovingienne* (Paris, 1943), 220. H. Stolpe and T. J. Arne, *La Nécropole de Vendel* (Stockholm, 1927), pl. XLII, fig. 13, show an object rather securely datable 650-700 which is interpreted as an iron reinforcement for a wooden stirrup, primarily because of its position in the horse-burial. But the U-shaped cross-section and lack of a ring at the top makes the identification improbable. Pl. XIV, fig. 1 shows stirrups from the same site datable c. 800; cf. 59. 21-22.

⁶ L. Lindenschmidt (Sohn), *Die Alterthümer unserer heidnischen Vorzeit*, v (Mainz, 1911), 196, pl. 36, figs. 576-7.

⁸ Müller-Karpe, op. cit. 61, fig. 28; 65 for date.

⁹ Mangoldt-Gauidlitz, op. cit. 74.

¹⁰ Cf. P. Reinecke, 'Reihengräber und Friedhöfe der Kirchen', *Germania*, ix (1925), 103-7.

¹¹ See p. 145.

symbolic value.¹ As a result, iconography lagged behind actuality, and innovations were seldom reflected in objects of art until their novelty had worn off and they were taken for granted.

One of the earliest representations of the stirrup in Christian art comes from a region where surely it had been known for a century previous. It is found in a miniature of the Magi riding to Bethlehem (Fig. 2), ornamenting a Jacobite Syriac homily thought to come from the region of Mardin in northern Mesopotamia, inside the Caliphate, and to date from the late eighth or early ninth century.² Yet, as we have seen, the Muslim armies first acquired the stirrup in A.D. 694 only a few hundred miles from Mardin.

An even more severe lag is found in the Byzantine representations.³ Only in the later ninth century do stirrups appear in three Greek books: MS. grec 510 (datable 880-6)⁴ and MS. grec 923,⁵ both of the National Library in Paris, and the Chludoff Psalter in Moscow.⁶

¹ L. White, jr., 'Natural science and naturalistic art in the Middle Ages', *American Historical Review*, lii (1947), 421-35. J. Pijoan, *Summa artis* (Madrid, 1935), 420, points out that the most conspicuous reaction against this tradition was the iconoclastic effort to produce a profane figurative art in close imitation of the antique manner; but this, of course, would have omitted stirrups.

² Berlin State Library, MS. Syr. 28, fol. 8^v; cf. A. Baumstark, 'Spätbyzantinische und frühchristlich-syrische Weihnachtsbilder', *Oriens christianus*, new series, iii (1913), 118, 123; E. Sachau, *Verzeichnis der syrischen Handschriften der Königlichen Bibliothek zu Berlin* (Berlin, 1899), 121. This date is accepted by A. Heisenberg in *Byzantinische Zeitschrift*, xxii (1913), 617; G. Millet, *Recherches sur l'iconographie de l'Évangile* (Paris, 1916), 149; H. Buchthal and O. Kurz, *Handlist of Illuminated Oriental Christian Manuscripts* (London, 1942), 9, no. 3.

³ The ivory in the Cluny Museum ascribed to the ninth century by R. Lefebvre des Noëttes, *L'Attelage*, fig. 344, is of the eleventh-twelfth centuries according to A. Goldschmidt and K. Weitzmann, *Byzantinische Elfenbeinskulpturen* (Berlin, 1930-4), no. 41. M. Bányai-Obershall, *The Crown of the Emperor Constantine Monomachos* (Budapest, 1937), 61, pl. XIII. 2, ascribes a Byzantine textile from the treasury at Mozac, and showing stirrups, to the eighth century on the basis of an unsupported legend that it was given to Mozac by Pipin the Short. H. d'Hennezel, *Decorations and Designs of Silken Masterpieces Ancient and Modern Belonging to the Textile Historical Museum at Lyon* (New York, 1930), pl. 9, places it in the ninth century.

⁴ Fols. 409^v, 440^r; cf. C. R. Morey, 'Notes on East Christian miniatures', *Art Bulletin*, xi (1929), 92; H. Omont, *Miniatures des plus anciens manuscrits grecs de la Bibliothèque Nationale* (Paris, 1929), 10, pls. LIV, LIX; J. Martin in *Late Classical and Mediaeval Studies in Honor of A. Friend* (Princeton, 1955), 191.

⁵ Fols. 329^r and perhaps 31^r; photographs in Princeton Index of Christian Art; cf. H. Bordier, *Descriptions des peintures et autres ornements contenus dans les manuscrits grecs de la Bibliothèque Nationale* (Paris, 1883), 90; K. Weitzmann, 'Die Illustrationen der Septuaginta', *Münchener Jahrbuch der bildenden Kunst*, iii-iv (1952-3), 105, III.

⁶ Moscow Historical Museum, MS. Greek 129, 97^v, 140^v; photographs in Princeton Index. Fol. 97^v is shown in O. Strunk, 'The Byzantine office at Hagia Sophia', *Dumbarton Oaks Papers*, ix-x (1956), 175-202, fig. 2. This Psalter may be of very early tenth century; cf. J. Martin, op. cit. 190. Indeed, L. H. Grondijs, 'La Datation des psautiers byzantins,

But from the writings of the Emperor Leo VI (886-911)¹ we know that by that time stirrups were standard equipment in the Byzantine cavalry, as indeed they had been some five generations earlier if we accept the very probable ascription of the *Strategikon* of the Pseudo-Maurice to the early eighth century.²

In view of this, we should not be astonished by a similar lag in the West: on the contrary, we may be surprised that the artists of the Frankish realms began to show stirrups a few decades earlier than those of the Greek East. Lefebvre des Noëttes believed that stirrups first appeared in the West about 840 in the Apocalypse of Valenciennes, 'd'origine espagnole'.³ The more recent opinion, however, credits this manuscript to the German Alps, and to somewhat after the middle of the ninth century⁴ along with the closely related Apocalypse of Paris, which likewise shows stirrups.⁵ However, two stirrumped horsemen appear in panels made about 840 for the famous altar of Sant' Ambrogio in Milan.⁶ Moreover, in the Golden Psalter of St. Gall, dating from the second half of the ninth century, of the nine riders in its miniatures whose equipment can be judged, seven have stirrups:⁷ clearly by that time stirrups were habitual so far as the artist was concerned.

et en particulier du psautier Chludof', *Byzantion*, xxv-xxvii (1955-7), 591-616, tries to place it in the eleventh century, with doubtful success.

¹ *Leonis imperatoris Tactica*, vi. 10, ed. R. Vári (Budapest, 1917), i. 105. The attempt of K. Zachariae von Lingenthal to ascribe this work to Leo III (717-40) has failed; cf. M. Mitard, 'Études sur le règne de Leon VI', *Byzantinische Zeitschrift*, xii (1903), 585-93, and E. Gerland in *Deutsche Literaturzeitung*, xli (1920), 469.

² *Infra*, p. 144.

³ Op. cit. 237, fig. 294. *Ibid.*, fig. 366, he suggests that an Indian chessman, supposedly given to Charlemagne by Hārūn ar-Rashīd, may have introduced the idea of the stirrup to the Franks; cf. A. Goldschmidt, *Die Elfenbeinskulpturen aus der romanischen Zeit* (Berlin, 1926), iv. 5, fig. 6. But this figure belongs to the time of the Crusades; cf. W. M. Conway, 'The abbey of Sant-Denis and its ancient treasures', *Archaeologia*, lxxvi (1915), 152, pl. XII, fig. 5.

⁴ Valenciennes Public Library, MS. 99, fols. 12^v, 13^r, 19^r, 35^r; photographs in Princeton Index; Bibliothèque Nationale, *Les Manuscrits à peintures en France du VII^e au XII^e siècle*, 2nd edn. (Paris, 1954), 41 (97); cf. W. Neuß, *Die Apokalypse des Hl. Johannes in der altspanischen und altchristlichen Bibel-Illustrationen* (Münster i. W., 1931), i. 249, 265, 286; H. Omont, 'Manuscrits illustrés de l'Apocalypse aux IX^e et X^e siècles', *Bulletin de la Société française de Reproductions de Manuscrits à Peintures*, vi (1922), pls. XVIII, XXVII; A. Boinet, *La Miniature carolingienne* (Paris, 1913), pls. CLVIII and CLIX; M. R. James, *The Apocalypse in Art* (London, 1931), 37.

⁵ National Library, Paris, MS. nouv. acq. latin 1132, fols. 8^v, 29^r; photographs in Princeton Index; cf. Omont, op. cit. 64; *Manuscrits à peintures*, 41 (98).

⁶ G. B. Tatum, 'The Paliotto of Sant' Ambrogio at Milan', *Art Bulletin*, xxvi (1944), 45, fig. 20; for date cf. V. Elbern, *Der karolingische Goldaltar von Mailand* (Bonn, 1952).

⁷ See p. 146.

It is archaeology, then, and not art history, which is decisive for the dating of the arrival of the stirrup in western Europe. And that date may be placed in the first part of the eighth century, that is, in the time of Charles Martel.

However, even if the Benedictine missionaries had worked a bit faster in extinguishing horse-burials, and had thus deprived us of the spade's testimony of the arrival of the stirrup in Germanic lands, we could have discovered by other means that it must have reached the Franks in the early eighth century. At that moment the verbs *insilire* and *desilire*, formerly used for getting on and off horses, began to be replaced by *scandere equos* and *descendere*,¹ showing that leaping was replaced by stepping when one mounted or dismounted. But a more explicit indication of the drastic shift from infantry to the new mode of mounted shock combat is the complete change in Frankish weapons which took place at that time.

The *francisca*, the distinctively Frankish battle-axe, and the *ango*, or barbed javelin, both infantry weapons, disappear in the eighth century, while the old *spatha* lengthens into a longsword for horse-men.² Moreover, from the ninth century onward these Germanic longswords were greatly prized by both Byzantines and Saracens.³ But above all, in the early decades of the eighth century there comes into wide use a spear having a heavy stock and spurs below the blade⁴ to prevent too deep penetration of the victim which might result in difficulty in withdrawing the weapon. This quickly developed into the typical Carolingian wing-spear, with a prominent cross-piece.⁵ Such lances were used, if we may believe the miniatures, both by infantry and cavalry. But their novel design is intelligible in terms of the new style of mounted shock combat with lance at rest. As we have already noted,⁶ a footman or an unstirrumped rider wielding the lance at the end of his arm could seldom have impaled an adversary so deeply that his weapon would get stuck. On the other hand, a stirrumped horseman with lance at rest delivering the stroke with the

¹ Schlieben, op. cit. 180.

² See p. 146.

³ A. Zeki Validi, 'Die Schwerter der Germanen nach arabischen Berichten des 9-11. Jahrhunderts', *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, xc (1936), 19-37. Salin, op. cit. iii. 97, 105-7, 112, 196, finds mass production of fine laminated swords for export in the Carolingian Rhineland; but, 107, believes that by the eleventh century the Germanic damascened sword passed out of use because of heavier defensive armour. However, such swords continued to be made into the twelfth century; cf. C. Panseri, 'Ricerche metallografiche sopra una spada da guerra del XII secolo', *Documenti e contributi per la storia della metallurgia*, i (1954), 5-33.

⁴ See p. 147.

⁵ See p. 147.

⁶ *Supra*, p. 8.

full momentum of his own body and that of his horse must often have done so, unless his spear were fitted with some baffle behind the blade. The generalization of the wing-spear in itself is evidence that under Charles Martel and his sons the meaning of the stirrup for shock combat was being realized.¹

The historical record is replete with inventions which have remained dormant in a society² until at last—usually for reasons which remain mysterious—they ‘awaken’ and become active elements in the shaping of a culture to which they are not entirely novel. It is conceivable that Charles Martel, or his military advisers, may have realized the potential of the stirrup after it had been known to the Franks for some decades. However, the present state of our information indicates that it was in fact a new arrival when he used it as the technological basis of his military reforms.

As our understanding of the history of technology increases, it becomes clear that a new device merely opens a door; it does not compel one to enter. The acceptance or rejection of an invention, or the extent to which its implications are realized if it is accepted, depends quite as much upon the condition of a society, and upon the imagination of its leaders, as upon the nature of the technological item itself. As we shall see, the Anglo-Saxons used the stirrup, but did not comprehend it; and for this they paid a fearful price. While semi-feudal relationships and institutions had long been scattered thickly over the civilized world, it was the Franks alone—presumably led by Charles Martel’s genius—who fully grasped the possibilities inherent in the stirrup and created in terms of it a new type of warfare supported by a novel structure of society which we call feudalism.

III

Mounted Shock Combat and the Temper of Feudal Life

The feudal class of the European Middle Ages existed to be armed horsemen, cavaliers fighting in a particular manner which was made possible by the stirrup. This *élite* created a secular culture closely related to its style of fighting and vigorously paralleling the ecclesiastical culture of the Church.³ Feudal institutions, the knightly class,

¹ See p. 147.

² e.g. the mechanical crank; cf. *infra*, pp. 110–15.

³ In its relationships with the ecclesiastical culture, chivalric culture seems to have been highly selective; e.g. E. R. Labande, ‘Le “Credo” épique: à propos des prières

and chivalric culture altered, waxed and waned; but for a thousand years they bore the marks of their birth from the new military technology of the eighth century.

While money had by no means gone out of circulation in the Frankish realm, the West of the eighth century was closer to a barter economy than was either contemporary Byzantium or Islam.¹ Moreover, the bureaucracy of the Carolingian kingdom was so slender that the collection of taxes by the central government was difficult. Land was the fundamental form of riches. When they decided that it was essential to secure cavalry to fight in the new and very expensive manner, Charles Martel and his heirs took the only possible action in seizing Church lands and distributing them to vassals on condition of knight’s service in the Frankish host.²

Fighting in the new manner involved large expenditures. Horses were costly, and armour was growing heavier to meet the new violence of mounted shock combat. In 761 a certain Isanhard sold his ancestral lands and a slave for a horse and a sword.³ In general, military equipment for one man seems to have cost about twenty oxen,⁴ or the plough-teams of at least ten peasant families. But horses get killed: a knight needed remounts to be effective; and his squire should be adequately mounted. And horses eat large quantities of grain, an important matter in an age of more slender agricultural production than ours.

Although in the Frankish realm the right and duty to bear arms rested on all free men regardless of economic condition,⁵ naturally the great majority could afford to come to muster only on foot, equipped with relatively inexpensive weapons and armour.⁶ As has been mentioned, even from this group Charlemagne tried to raise horsemen⁷ by commanding that the less prosperous freemen should

dans les chansons de geste’, *Mémoires et documents publiés par la Société de l’École des Chartes*, xii. ii (1955), 62–80, shows that these knightly prayers contain chiefly Biblical materials, and far less apocryphal and legendary matter than is to be found in the iconography of contemporary churches. ¹ See p. 148.

² Prejudice against confiscation of Church lands was so strong that by 755 the Carolingians began to require the holders of such *precariae verbo regis* to pay to their former clerical owners one-fifth of the produce annually. Clarifying much earlier confusion, G. Constable, ‘*Nona et decima: an aspect of Carolingian economy*’, *Speculum*, xxxv (1960), 224–50, shows that these payments were quite distinct from the regular tithe which was due from all lands.

³ H. Wartmann, *Urkundenbuch S. Gallen* (Zürich, 1863), i. 34, no. 31.

⁴ *Lex ribuaria*, xxvii. 11, *MGH, Leges*, v. 231; cf. Delbrück, *op. cit.* iii. 4; Kaufmann, *op. cit.* i. 339, n. 1.

⁵ See p. 148.

⁶ See p. 149.

⁷ Fehr, *op. cit.* 118–19, shows that the effort of A. Dopsch, *Wirtschaftsentwicklung*

band together, according to the size of their lands, to equip one of their number and send him to the wars.¹ Such an arrangement would be hard to administer, and it did not survive the confusion of the later ninth century.² But inherent in this device was the recognition that if the new technology of warfare were to be developed consistently, military service must become a matter of class. Those economically unable to fight on horseback suffered from a social infirmity which shortly became a legal inferiority. In 808 the infelicitous wording of a capitulary *De exercitu promovendo* distinguishes 'liberi' from 'pauperes':³ the expression is legally inexact, but it points to the time when freedom was to become largely a matter of property. Two capitularies of 825 show how rapidly concepts were moving. One separates 'liberi' from 'mediocres quippe liberi qui non possunt per se hostem facere'; while the other refers to those latter as 'liberi secundi ordinis'.⁴ With the collapse of the Frankish empire, the feudality which the Carolingians had deliberately created, in terms of the new military method of mounted shock combat, to be the backbone of their army became the governing as well as the fighting élite. The old levy of freemen (although not all infantry) vanished, and a gulf appeared between a warrior aristocracy and the mass of peasants. By about the year 1000, *miles* had ceased to mean 'soldier' and had become 'knight'.⁵

The feudal aristocrat might, indeed, be a ruler, but this was incidental to his being a warrior. A student of medieval poetry has remarked that the 'essential note of true knighthood is to put down wrong-doers—not a magistracy but a substitute or supplement for magistracy'.⁶ The image of the cavalier reflected in his literature *der Karolingerzeit* (Weimar, 1913), ii. 18–19, to prove that this plan of sharing military burdens is older than Charlemagne rests upon a misinterpretation of a capitulary of 825 (*MGH, Cap. i. 325, c. 3*).

¹ *MGH, Cap. i. 134, c. 2*; cf. Brunner, *Deutsche Rechtsgeschichte*, 2nd edn. (Munich, 1928), ii. 273–5.

² It last appears in 864; cf. *MGH, Cap. ii. 310*.

³ *MGH, Cap. i. 137, c. 2*.

⁴ *Ibid.* 329, c. 1; 325, c. 3; cf. K. Bosl, 'Freiheit und Unfreiheit: zur Entwicklung der Unterschichten in Deutschland und Frankreich während des Mittelalters', *Vierteljahrsschrift für Sozial- und Wirtschaftsgeschichte*, xlv (1957), 206–7.

⁵ G. Duby, *La Société aux XI^e et XII^e siècles dans la région mâconnaise* (Paris, 1953), 231; F. L. Ganshof, 'Les Relations féodo-vassaliques aux temps post-carolingiens', *Settimane di studio del Centro Italiano di Studi sull'Alto Medioevo*, ii (1955), 83–85; K. J. Hollyman, *Le Développement du vocabulaire féodal en France pendant le haut moyen âge* (Paris, 1957), 129–34.

⁶ G. Mathew, 'Ideals of knighthood in late fourteenth-century England', *Studies in Medieval History presented to F. M. Powicke* (Oxford, 1948), 360.

shows that his self-respect was based primarily on two ideal virtues: loyalty to his liege (after the troubadours had done their work, to his lady as well), and prowess in combat. Both *loiautee* and *proesce* were integral to feudal origins.

The members of the feudal class held their lands and enjoyed their status by reason of loyalty in regard to their obligation of knight's service. Gradually the concept was broadened to include other 'aids', notably assisting at the court of one's liege lord. But the original and basic knight's service was mounted shock combat. When the central royal authority evaporated during the later ninth century, subinfeudation assured that the concept of feudal loyalty remained vigorous. Feudal tenures quickly became hereditary, but they could be inherited only by one able to fulfil the duty of knight's service. Elaborate rules for the wardship of minors, and regulations requiring widows and heiresses to marry, guarded this essential requirement for enfeoffment.

The chivalric class never repudiated the original condition of its existence: that it was endowed to fight, and that anyone who could not or would not meet his military obligations forfeited his endowment. The duty of knight's service is the key to feudal institutions. It is 'the touchstone of feudalism, for through it all else was drawn into focus; and its acceptance as the determining principle of land-tenure involved a social revolution'.¹

The feudal sense that the enjoyment of wealth is inseparable from public responsibility chiefly distinguishes medieval ideas of ownership from both classical and modern. The vassal class created by the military mutation of the eighth century became for generations the ruling element of European society, but through all subsequent chaos, and despite abuses, it never lost completely its sense of *noblesse oblige*, even when a new and rival class of burghers revived the Roman notion of the unconditional and socially irresponsible possession of property.

The second element in a knight's pride, prowess, was inherent in the adequate performance of his service. Quite apart from the cost of arms and horses, the new mode of fighting necessarily destroyed the old Germanic idea that every freeman was a soldier. Mounted shock combat was not a business for part-time warriors: one had to be a skilled professional, the product of a long technical training, and in excellent physical condition. Towards the middle of the ninth

¹ H. A. Cronne, 'The origins of feudalism', *History*, xxiv (1939), 253.

century Hrabanus Maurus quotes a Frankish proverb that to learn to fight like a knight one must start at puberty. Even more significant is Hrabanus's indication that in his time the households of great lords had already become schools in which boys were trained in the chivalric arts, probably including practice in the tilt-yard.¹

Stenton has remarked that 'the apprenticeship which preceded knighthood is the most significant fact in the organization of feudal society'.² It welded together a self-conscious, cosmopolitan military caste, aware of its solidarity and proud of its traditions, an essential part of which was great rivalry among knights in feats of arms. When a youth was at last admitted to the guild of knights,³ he was professionally committed to slaying dragons. The new mode of combat, with its high mobility and fearful impact, opened fresh fields for deeds of individual prowess. The old days were gone of standing in formation in the shield-wall and thrusting and hacking. While in the feudal age major battles were often planned carefully, and executed with admirable discipline by squadrons of knights,⁴ the emotional life of the chivalric warrior was highly individualized. Long passages of the *chansons de geste* are devoted to blow-by-blow accounts of mighty encounters which can be appreciated only if one pictures the technical interests of the feudal audience. And at last, in Froissart's *Chronicle*, the chivalric world produced a philosophy of history which announced the recording of great feats of arms for the edification of posterity to be the chief duty of Clio.⁵

Keeping physically fit and dexterous in the use of arms in shock combat were the presuppositions of ability to display both loyalty to the liege and prowess in battle. To that end the chivalric stratum

¹ See p. 149.

² F. M. Stenton, *First Century of English Feudalism, 1066-1166* (Oxford, 1932), 131.

³ See p. 150.

⁴ P. Pieri, 'Alcuni quistioni sopra la fanteria in Italia nel periodo comunale', *Rivista storica italiana*, 1 (1933), 567-8; J. F. Verbruggen, 'La Tactique militaire des armées de chevaliers', *Revue du nord* xxix (1947), 161-80, and his *De krijgskunst in West-Europa in de middeleeuwen, IX^e tot begin XIV^e eeuw* (Brussels, 1954), esp. 52-58, 148-54, destroy the conventional view that medieval battles were disorderly slaughter. On the contrary, knights habitually fought, both in the field and at tournaments, in *connois* of from twelve to forty horsemen operating as a shock-combat group and placing great stress upon maintaining a line formation at the charge.

⁵ *Chroniques de J. Froissart*, ed. S. Luce (Paris, 1869), i. 1: 'Afin que les grans merveilles et li biau fait d'armes, qui sont avenu par les grans guerres de France et d'Engleterre et des royaumes voisins, dont li roy et leurs consaulz sont cause, soient notablement registré et ou temps present et a venir veu et cogneu, je me voel ensonnuer de l'ordonner et mettre en prose.'

developed and elaborated a deadly and completely realistic game of war—the tournament. In 842 there was a formidable passage at arms near Strassburg in the presence of Charles the Bald and Louis the German, and evidently at that time such events were not exceptional.¹ However, concrete evidence about such knightly free-for-alls is scanty until the twelfth century. Thereafter they 'formed the pastime of the higher class up to the Thirty Years War'.²

As the violence of shock combat increased, the armoured skill tried to meet it by building heavier and heavier defences for the knight. Increasingly he became unrecognizable beneath his carapace, and means of identification had to be developed.³ In the Bayeux Tapestry of the late eleventh century the pennons are more individualized than the shields.⁴ By the early twelfth century, however, not only armorial devices but hereditary arms were coming into use in France, England, and Germany.⁵ It is not playing tricks with semantics to insist that the feudal knight himself, and his society, knew who he was in terms of his arms. The exigencies of mounted shock combat, as invented by the Franks of the eighth century, had formed both his personality and his world.

Wherever the Carolingian realm extended its vast borders, it took its mode of fighting, its feudal institutions, and the seeds of chivalry. In Italy, for example, although anticipations of feudal relationships can be discovered in the Lombard kingdom, the feudal combination of vassalage and benefice was introduced by Charlemagne's conquest

¹ Nithard, iii. 6, *MGH, Scriptores*, ii. 667: 'Ludos etiam hoc ordine saepe causa exercitii frequentabant.' Cf. F. Niederer, *Das deutsche Turnier im XII. und XIII. Jahrhundert* (Berlin, 1881), 7.

² R. C. Clephan, *Defensive Armour* (London, 1900), 77. K. G. T. Webster, 'The twelfth-century tourney', in *Anniversary Papers by Colleagues of G. L. Kittredge* (Boston, 1913), 227-34, and N. Denholm-Young, 'The tournament in the thirteenth century', in *Studies in Medieval History presented to F. M. Powicke* (Oxford, 1948), 240-68, emphasize the brutal realism of the tourney as practice for war.

³ That identification, not merely ornamentation, was the functional reason for the emergence of heraldry is indicated by the fact that the earliest term for arms is *cunissances* or *conoissances*; cf. R. Chabanne, *Le Régime juridique des armoiries* (Lyons, 1954), 3-4. Since all warriors, until our age of camouflage, have decorated their arms, we should beware of discovering heraldry in the early tenth century when Abbo, *De bellis Parisiaci urbis*, i. 1. 256-7, in *MGH, Scriptores*, ii. 783, says that from the walls of besieged Paris 'nihil sub se nisi picta scuta videt'.

⁴ See p. 150.

⁵ P. Gras, 'Aux origines de l'héraldique: La décoration des boucliers au début du XII^e siècle, d'après la Bible de Citeaux', *Bibliothèque de l'École des Chartes*, cix (1951), 198-208; A. R. Wagner, *Heralds and Heraldry in the Middle Ages* (Oxford, 1956), 13-17; C. U. Ulmenstein, *Über Ursprung und Entstehung des Wappenwesens* (Weimar, 1935), 15, 56-60.

of the late eighth century.¹ But even where Frankish institutions and attitudes did not penetrate, their mode of fighting could not be disregarded.

In Byzantium the new military technology of the Franks was making itself felt by the time of Nicephoras II Phocas (963-9) who, because of the great increase in the cost of arms, felt compelled to raise the value of the inalienable minimum of a military holding from four to twelve pounds of gold.² Here, as in the West, military change on such a scale involved profound social change. As Ostrogorsky remarks, it 'must certainly have meant that the Byzantine army would henceforth be composed of a different social class. The heavily armed soldiers of Nicephoras . . . could no longer be the old peasant militia'.³ Like their Germanic neighbours, the Greeks increased their emphasis on cavalry to the point where, in the tenth century, the garrison of Constantinople consisted of four regiments of horse as compared with one of infantry.⁴

Even the forms and uses of Byzantine arms came to be copied from the West. The earliest Frankish pictures of the lance held at rest come from the end of the ninth century;⁵ the first Byzantine representations are of the tenth to eleventh centuries.⁶ By about the year 1000 the demands of mounted shock combat had led the Franks

¹ P. S. Leicht, 'Gasindi e vassalli', *Rendiconti della Reale Accademia Nazionale dei Lincei, Classe di scienze morali, etc.*, ser. 6, iii (1927), 291-307, and 'Il feudo in Italia nell'età carolingia', *Settimane di studio del Centro Italiano di Studi sull'Alto Medioevo*, i (1954), 71-107.

² F. Dölger, *Regesten der Kaiserurkunden des oströmischen Reichs* (Munich, 1924), i, 93, no. 721; J. and P. Zepos, *Jus graecoromanorum* (Athens, 1931), i, 255-6. P. Lemerle, 'Esquisse pour une histoire agraire de Byzance: les sources et les problèmes', *Revue historique*, cxxx (1958), 53, rightly deplors the lack of special studies of Byzantine armament which would permit us to judge exactly the basis of Nicephoras Phocas's drastic action.

³ In *Cambridge Economic History of Europe*, i (Cambridge, 1941), 208; cf. E. H. Kantorowicz, 'Feudalism' in the Byzantine Empire', *Feudalism in History*, ed. R. Coulborn (Princeton, 1956), 161-2. Lemerle, loc. cit., n. 4, challenges Ostrogorski on this point; but whatever Nicephoras Phocas's intentions, would not the result of his decree be to raise the endowed soldier to a higher social class?

⁴ C. Diehl and G. Marcais, *Le Monde oriental de 395 à 1081* (Paris, 1936), 464.

⁵ *Infra*, p. 148.

⁶ A. Goldschmidt and K. Weitzmann, *Die byzantinische Elfenbeinskulpturen des X.-XIII. Jahrhunderts* (Berlin, 1930), i, nos. 12, 20; also no. 98c, of the twelfth century, in which the authentic portion of a modern forgery shows two Byzantine riders charging each other with lances at rest. D. Koco, 'L'Ornementation d'un vase à mesurer du Musée Cluny et les "Stecci" bosniaques', *Artibus Asiae*, xv (1952), 198, fig. 2, shows a Bosnian tombstone of the later Middle Ages with two knights wearing helmets of oriental design but equipped with Western shields, and jousting with the lance at rest.

to modify the older circular or oval shield by lengthening it to a pointed kite shape which gave greater protection to the knight's left leg.¹ A century later this is found in Constantinople.² Moreover, the cross-bow, which the West had invented, or revived, or borrowed from China in the later tenth century as an 'anti-tank gun' to penetrate the massive new armour,³ was a complete novelty to Anna Comnena in Byzantium at the time of the First Crusade.⁴

Nor was Islam exempt, even before the First Crusade, from the contagion of Frankish military ideas. In 1087, when Armenian architects built the Bāb an-Naṣr, one of the three great gates of Cairo, it was decorated with a frieze of shields, some round, but some rounded above and pointed below such as we see the Normans carrying in the Bayeux Tapestry.⁵ The Arabic word for such pointed shields, *tāriqa*, is derived from the French *targe*.⁶ By Saladin's day, the Muslims were using several kinds of cross-bows;⁷ they employed the new method of shock combat;⁸ and their word for the heavy lance, *qunṭariya*, was either of Greek or Romanic derivation.⁹ They much admired the brilliance of the Christian painted shields,¹⁰ and there can be little doubt that the basic concept of Saracenic heraldry is a reflection of the Frankish. By the later thirteenth century the tournament on the Western pattern was practised by the Muslim chivalry of Syria and Egypt.¹¹ Perhaps most significant is the admiration with which al-Herewī (d. A.D. 1211) describes the carefully coordinated battle tactics of the Franks, and the way cavalry and infantry gave mutual support.¹²

¹ For a West German ivory of c. 1000, cf. H. Schnitzler, *Der Dom zu Aachen* (Düsseldorf, 1950), pl. 59; for the Catalan Farfa Bible, fols. 94^v, 161^r, 342^r, 352^r, 366^v, see *infra*, p. 150; for the Codex aureus Epternachensis, fol. 78, datable c. 1035-40, cf. A. Grabar and C. Nordenfalk, *Early Medieval Painting* (New York, 1957), 212.

² *Octateuch* of the Library of the Seraglio, MS. 8, fols. 134^r, 136^v, 139^r, 368^r; photographs in Princeton Index. For date, cf. K. Weitzmann, *The Joshua Roll* (Princeton, 1948), 6.

³ See p. 151.

⁴ *Alexiad.*, tr. E. A. S. Dawes (London, 1928), 255.

⁵ K. A. C. Cresswell, 'Fortification in Islam before A.D. 1250', *Proceedings of the British Academy*, xxxviii (1952), 114.

⁶ C. Cahen, 'Un traité d'armurerie composé pour Saladin', *Bulletin d'études orientales de l'Institut français de Damas*, xii (1948), 137, 155, n. 2, 160.

⁷ *Ibid.* 127-9, 150-1.

⁸ *Supra*, p. 2, n. 2.

⁹ *Ibid.* 134-6, 154-5.

¹⁰ *Ibid.* 137, 155, n. 2; L. A. Mayer, *Saracenic Heraldry, a Survey* (Oxford, 1933), does not offer evidence of East-West influences.

¹¹ H. Ritter, 'La Parure des cavaliers [of ibn Hudail] und die Literatur über die ritterlichen Künste', *Der Islam*, xviii (1929), 122, 127. W. B. Ghali, *La Tradition chevaleresque des arabes* (Paris, 1919), 28, 32-33, concludes that the idea of an 'order' of knighthood was likewise adopted from the West in the twelfth century.

¹² Ritter, op. cit. 147.

If such was the situation in the Levant, we should expect even greater Frankish influence upon Spanish Islam. We have already noted¹ that the Moors developed their emphasis on cavalry a generation after Charles Martel's reform, and were possibly inspired by it. In any case by the thirteenth century the knights of the Reconquista were setting the styles for their Saracenic adversaries. Ibn Sa'id tells us that 'Very often the Andalusian princes and warriors take the neighbouring Christians as models for their equipment. Their arms are identical, likewise their surcoats of scarlet or other stuff, their pennons, their saddles. Similar also is their mode of fighting with bucklers and long lances for the charge. They use neither the mace nor the bow of the Arabs, but they employ Frankish crossbows for sieges and arm infantry with them for their encounters with the enemy.'² Since the Berbers across the Strait of Gibraltar were not so often in contact with Christian arms, Ibn Sa'id notes that they could use light equipment, whereas the Christian peril compelled the Spanish Muslim warriors to be 'weighed down by the burden of buckler, long thick lance and coat of mail, and they cannot move easily. Consequently their one aim is to stick solidly to the saddle and to form with the horse a veritable iron-clad whole.'³

The most spectacular extension, however, of the Frankish military technology, together with all its social and cultural concomitants, was the Norman conquest of England. The Anglo-Saxons were acquainted with the stirrup,⁴ but did not sufficiently modify their methods of warfare in terms of it. In Anglo-Saxon England there were seigniorial elements, as there had been in Merovingian Gaul; but there was little tendency towards feudalism or the development of an *élite* of mounted warriors.⁵ Harold, his thegns and housecarls, rode stirrugged horses: at the battle of Stamford Bridge King Harold Hardrada of Norway said of him 'That was a little man, but he sat firmly in his stirrups'.⁶ However, when they reached Hastings

¹ *Supra*, pp. 12-13, n. 1.

² Quoted by E. Lévi-Provençal, *L'Espagne musulmane au Xe^{me} siècle* (Paris, 1932), 146.

³ See p. 152.

⁴ For the Anglo-Saxon word, see *infra*, pp. 142-3. A stirrup of the Viking age has been found in the Thames; cf. *London Museum Catalogues, No. 1: London and the Vikings* (London, 1927), 39, fig. 17. On the use of cavalry by the invading Norsemen, see J. H. Clephan, 'The horsing of the Danes', *English Historical Review*, xxv (1910), 287-93, rather than F. Pratt, 'The cavalry of the Vikings', *Cavalry Journal*, xlii (1933), 19-21.

⁵ Stenton, *op. cit.* 125, 130-1.

⁶ *Heimskringla*, iv. 44, tr. S. Laing (London, 1930), 230. R. Glover, 'English warfare

they dismounted to do battle on foot, in the old Germanic shield-wall¹ with which Charles Martel had defeated the Saracens at Poitiers.

At Hastings² the Anglo-Saxons had the advantage of position on the hill of Senlac; they probably outnumbered the Normans; they had the psychological strength of fighting to repel invaders of their homeland. Yet the outcome was certain: this was a conflict between the military methods of the seventh century and those of the eleventh century. Harold fought without cavalry and had few archers. Even the English shields were obsolete: the Bayeux Tapestry shows us that while the royal bodyguard fought with kite-shaped shields—probably a result of Edward the Confessor's continental education—most of the Anglo-Saxons were equipped with round or oval shields.³ From the beginning William held the initiative with his bowmen and cavalry, and the English could do nothing but stand and resist a mobile striking power which at last proved irresistible.

When William had won his victory and the crown of England, he rapidly modernized, i.e. feudalized, his new kingdom. Naturally he preserved and incorporated into the Anglo-Norman order whatever institutions of the Anglo-Saxon régime suited his purpose; but innovation was more evident than continuity. Just as the Carolingians 300 years earlier had deliberately systematized and disciplined the long-established tendencies towards seigniority in Frankish society in order to strengthen their position, so William the Conqueror used the fully developed feudal organization of the eleventh century to establish the most powerful European state of his generation.⁴

Indeed, the England of the later eleventh century furnishes the

in 1066', *English Historical Review*, lxvii (1952), 5-9, defends the use of this late source for an understanding of the battle of Stamford Bridge.

¹ W. G. Collingwood, *Northumbrian Crosses of the Pre-Norman Age* (London, 1927), 172, fig. 211, shows an Anglo-Saxon relief of c. 1000 from Gosforth in Cumberland depicting an army with heavy swords and round shields overlapping to form a shieldwall.

² Cf. W. Spatz, *Die Schlacht von Hastings* (Berlin, 1896); A. H. Burne, *The Battlefields of England* (London, 1950), 19-45. In his brilliant reappraisal not only of Hastings but of the entire campaign of which it was the culmination, R. Glover, *op. cit.*, 1-18, shows that Anglo-Saxons could fight effectively as cavalry, and explains some of the special circumstances which led to their reversion to infantry at Senlac. However (14, n. 3) he underestimates the iconographic conservatism of the Bayeux Tapestry in representing Norman methods of combat (cf. *infra*, p. 147), and his findings, as is remarked by G. W. S. Barrow, *Feudal Britain* (London, 1956), 34, do not alter the essential fact 'that Hastings was a decisive defeat of infantry by cavalry-with-archers'.

³ K. Pfannkuche, *Der Schild bei den Angelsachsen* (Halle a. S., 1908), 52-53.

⁴ See p. 153.

classic example in European history of the disruption of a social order by the sudden introduction of an alien military technology. The Norman Conquest is likewise the Norman Revolution. But it was merely the spread across the Channel of a revolution which had been accomplished by stages on the Continent during the preceding ten generations.

Few inventions have been so simple as the stirrup, but few have had so catalytic an influence on history. The requirements of the new mode of warfare which it made possible found expression in a new form of western European society dominated by an aristocracy of warriors endowed with land so that they might fight in a new and highly specialized way. Inevitably this nobility developed cultural forms and patterns of thought and emotion in harmony with its style of mounted shock combat and its social posture; as Denholm-Young has said: 'it is impossible to be chivalrous without a horse.'¹ The Man on Horseback, as we have known him during the past millennium, was made possible by the stirrup, which joined man and steed into a fighting organism. Antiquity imagined the Centaur; the early Middle Ages made him the master of Europe.

¹ Op. cit. 240.

CHAPTER II

The Agricultural Revolution of the Early Middle Ages

FROM the Neolithic Age until about two centuries ago, agriculture was fundamental to most other human concerns. Before the late 1700's there was probably no settled community in which at least nine-tenths of the population were not directly engaged in tillage. Rulers and priests, craftsmen and merchants, scholars and artists, were a tiny minority of mankind standing on the shoulders of the peasants. Under such circumstances any lasting change in climate, soil fertility, technology, or the other conditions affecting agriculture would necessarily modify the whole of society: population, wealth, political relationships, leisure, and cultural expression.

Yet this has not been obvious to the world of scholars: nowhere are the urban roots of the word 'civilization' more evident than in the neglect which historians have lavished upon the rustic and his works and days. While the peasant has normally been a lively and enterprising fellow, quite unlike the tragic caricature of combined brutishness and abused virtue presented in Millet's and Markham's 'Man with the Hoe';¹ he has seldom been literate. Not only histories but documents in general were produced by social groups which took the peasant and his labours largely for granted. Therefore while our libraries groan with data on the ownership of land, there is an astonishing dearth of information about the various, and often changing, methods of cultivation which made the land worth owning.²

¹ F. Martini, *Das Bauerntum im deutschen Schrifttum von den Anfängen bis zum 16. Jahrhundert* (Halle, 1944), esp. 390-3, analyses the very old elements entering into the modern stereotype of the peasant as they emerge in the works of medieval poets and preachers. On the one hand, the peasant is obtuse, grotesque, at times dangerous; on the other, he is hardworking, attached to the good old traditions, the supplier of food for all mankind, and loved of God for his humility. When the actualities rather than the fictions of rural life are examined, they appear as kaleidoscopic as those of any other form of human activity; cf. C. Parain, 'La Notion de régime agricole', *Mois d'ethnographie française*, iv (1950), 99, and 'Les Anciennes techniques agricoles', *Revue de synthèse*, lxxviii (1957), 326.

² For example, A. Dopsch, 'Die Herausgabe von Quellen zur Agrargeschichte des Mittelalters: ein Arbeitsprogramm', in *Verfassungs- und Wirtschaftsgeschichte des Mittelalters* (Vienna, 1928), 516-42, is entirely legal and institutional in emphasis.