On the Training of the Agrimensores in Republican Rome and Related Problems: Some Preliminary Observations

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In his magisterial Histoire de l'éducation dans l'antiquité H.-I. Marrou does not seem to say anything about the training of the land surveyors (agrimensores) in Rome during the Republic.¹ This is rather surprising; for their work was of the greatest importance for Roman society and its very nature was such that it required a considerable amount of very specialized knowledge. While the earliest handbooks which have been preserved were not composed till the first century A.D.,² it seems most unlikely that such specialized knowledge could be transmitted through experts practising the art and taught without theoretical instruction, without books, without a school.³ For it is clearly a very difficult discipline with numerous technical aspects, further developed by the Romans over a long period of time, but not invented by them, but going further back.


This paper was originally written for a seminar which I held in Göttingen in 1975; the publication of the proceedings of the symposium (Feldmeßkunst) made me reread it, reconsider my arguments, rewrite it and give it the present form.

² For the texts see F. Blume et al. (edd.), Die Schriften der römischen Feldmesser I-II (Berlin 1848-52) and C. Thulin (ed.), Corpus Agrimensorum I.1: Opuscula Agrimensorum Veterum (Leipzig 1913); for a brief characterization, see Dilke (previous note) 126-32, 227-30.

³ See e.g. M. Fuhrmann, Das systematische Lehrbuch (Göttingen 1960) 181; Schindel (above, note 1) 375.
I

The art of measuring land was, no doubt, practised by the Babylonians, by the Egyptians, by the Israelites and later by the Greeks. In his chapter on pre-Roman surveying and geodesy\(^4\) O. A. W. Dilke states: "The study of archaic and classical Greece has so far revealed little evidence of systematic land surveying." Yet the administration and taxation of land as well as the construction of cities, especially such patterns of town-planning as designed by Hippodamus of Miletus,\(^5\) required a high degree of skill in surveying, and the same is true of the distribution and allocation of land to colonists. At any rate, in Hellenistic times the Greeks had land registers, and during this period scholars concerned themselves with computing the circumference of the earth and degrees of latitude and longitude, but also with the ways and means of surveying land.\(^6\)

The Romans, too, had to measure land from a very early period onward, not least in order to determine the exact boundaries of certain areas for religious purposes. For the taking of auspices, e.g., an augur had to demarcate a *templum* with the greatest care, and both at the time of Cicero and still at the time of the younger Pliny the precise delimitation of ground dedicated and not dedicated to the gods proved to be of vital importance;\(^7\) also the fixing of a city's boundaries was regarded as a kind of ritual. However, the art of surveying and measuring land was equally important for many non-religious purposes—for the divison of farm-land, for the demarcation of plots in cities, for the planning of towns, for the allocation of land to colonists and for the measuring and construction of military camps.

The close connexion between surveying and religious functions, especially the fixing of a *templum* and the discipline of the augurs, raises the problem of possible Etruscan influence, as, indeed, the obviously older practice of the Greeks in the South of the peninsula poses the question to what extent the Romans developed this art themselves. Dilke comes to the conclusion that it "would be wrong to claim that the Romans simply copied the system which they found in the Greek colonies of South Italy and Sicily... What the Romans did was to combine features from Egypt,

\(^4\) Dilke (above, note 1) 22.


\(^6\) Cf. Dilke (above, note 1) 26–30.

\(^7\) See e.g. Cicero's speech *De Domo Sua* 100–41 (cf. C. J. Classen, *Recht Rhetorik Politik* [Darmstadt 1985] 218–67, esp. 256–64); Plin. *Epist.* 10. 49, 70, 71. O. Behrends, in *Feldnψenkunst* (above, note 1) 192–280 argues that Roman planning and founding of settlements and defining of boundaries as well as all ideas and concepts relating to law and property have their roots in the augurs' science and their activities; a religious origin and background of land surveying seems, indeed, more probable than a military one.
Etruria, Greek towns and Greek countryside to make their own distinctive system.” How was this passed on from generation to generation?

II

When we turn to the difficult question of the instruction and training of land surveyors and the transmitting of the relevant technical skill in Rome, we have to determine—and this is not quite so easy as Adolf Rudorff makes it appear to be in the famous edition of the Landvermesser—what types of land surveyors the Romans knew, which functions they had to perform, what kind of knowledge was required for each group and in each case and where this knowledge and skill could be acquired, whether by imitating experts who practised the art, by learning from specialists who taught this art theoretically, or by reading books.

The earliest reference to a land surveyor in Roman literature occurs in the prologue of Plautus’ Poenulus (48–49): “Now I shall determine its (i.e. the play’s) areas, limits, boundaries; I have been selected as its surveyor.”

The next instances are found in Cicero’s speeches against Rullus’ agrarian law which provides ten decemvirs—as the orator claims—with almost unlimited powers and numerous assistants. The relevant passages together with those from his Philippics have often been quoted in this context, but not quite so frequently interpreted carefully and are, therefore, usually misunderstood.

Cicero imputes to Rullus the intention of appointing two hundred surveyors (finitores) of equestrian origin, i.e. for each of the decemviri twenty “bodyguards, at the same time servants and henchmen of their power” (Agr. 2. 32); a little later he adds that the decemviri will have the power to send out a land surveyor, and “what the surveyor has reported to the one man by whom he has been sent will be ratified” (34); in a third passage he speaks of the decemviri roaming about the whole world, vested with an official imperium, furnished with fasces and “accompanied by that well-known kind of carefully chosen young surveyor” (45); and where he finally paints a vivid, but totally imaginary picture of his adversary Rullus,

8 Dilke (above, note 1) 34. On possible Etruscan influence, see W. Hübner in Feldmeßkunst (above, note 1) 144–45, 171.

9 A. Rudorff in Feldmesser (above, note 2) II 320.


12 Singulorum stipalores corporis constituti, eosdem ministros et satellites potestatis.
holding an auction of the newly conquered spoils, he goes yet a step further, describing the finitores as handsome young men (53).  

First Cicero introduces the finitores in his attack on Rullus in terms which allow him to make his enemy appear as a tyrant; later he insists on the attractiveness of the finitores in order to make his audience associate such vices as the general public would attribute to young members of the wealthy class. Nowhere does he imply that they might have expertise in surveying, nor does he ridicule them for lacking the necessary competence. Obviously, no more specialized knowledge would and could be expected from these young knights than from any other young men who accompanied magistrates or other officials in the provinces. It follows that some other people must have had the expertise required and that they carried out the actual work of surveying.  

No less instructive, I think, is the manner in which Cicero considers it appropriate to abuse another of his victims, L. Decidius Saxa, a protégé of Caesar’s and later a partisan of M. Antonius. Caesar honours him by mentioning him once in his Bellum Civile (1. 66. 3), yet without attributing any particularly meritorious action to him. Cicero vilifies him in the most venomous terms. In his first attack in the eighth Philippic he speaks of him together with Calo as types, disasters, animals rather than human beings, imputing to them the craving for other people’s property, villas and land (8. 9). He refers again to the attribution of land to Decidius Saxa a little later where he calls Calo and him strong centurions, at the same time placing them in the company of actors, gamblers and brothel keepers (8. 26; cf. 10.

13 34: finitorem mitiant, ratum sit quod finitor uni illi a quo missus erit, renuntiaverit; Nicolet (above, note 11) 99 remarks: “Il ne s’agit aucunement de simple ouvriers, ceux qui manœuvrent les gromae et les peritacae, mais d’hommes responsables, qui signent en quelque sort leur renuntiatio,” thereby making an important distinction; but were those who actually applied the instruments simple workmen? Hinrichs (above, note 1) 76–77 misunderstands the passage completely. 45: cum illa deflecta finitorum iuventute et 53: cum suis formosis finitoribus. For stipatones, cf. Verr. 3. 65, Dom. 13; for formosus see Verr. 2. 1. 91, 92, 5. 63, 73, Pis. 89; only Verr. 2. 4. 136 for ladies.

14 See previous note. Schindel (above, note 1) 379–80 cites what Frontinus says in introducing (and justifying) his work on aqueducts (Ag. 2. 1): neque enim... crediderim... aitutam tam indecorum tolerabili viro, quam delegatum officium ex adiutorum agere praeceditis, quod fieri necesse est, quotiens imperia praepositii ad... decurrit usum, quorum etiam necessariae partes sunt ad ministerium, tamen ut manus quaedam et instrumentum agentis; on the text, see W.-W. Ehlers, “Frontiniana,” Rhein. Mus. 126 (1983) 76. There can, then, be no doubt that often the people to whom an office was entrusted lacked the necessary knowledge up to the time of Frontinus (about 30–104 A.D.), who was also the first to write a manual on land surveying.

15 Postero die Petreius cum paucis equitibus occulte ad exploranda loca proficiscitur. hoc idem fil ex castris Caesaris. mittitur L. Decidius Saxa cum paucis qui loci naturam perspiciat. uterque idem suis renuntiat: V milia passum proxima intercedere itineris campestris, inde excipere loca aspera et montuosa; qui prior has angustias occupaverit, ab hoc hostem prohiberi nihil esse negotii. It should be obvious that this has nothing to do with surveying; cf. Caesar’s use of perspicere: Gall. 4. 21. 9, 7. 36. 1, 44. 1, 68. 13, apart from the parallel with Petreius.
Having described them again as coarse and boorish in the tenth Philippic (10. 22; cf. 8. 9), in his next assault he not only contrasts Decidius’ alleged obscure origin (11. 12; cf. 13. 27) with the office to which Caesar helped him to rise, but also his former activity as “measurer of camps” with the possible future function as “measurer of the city” (11. 12: castrorum ante metator, nunc, ut sperat, urbis), and Cicero repeats this allegation in his last speech, claiming that the “experienced and clever measurer with his measuring pole” had already divided up the city anew to satisfy the wishes of Antonius (14. 10).

Throughout Cicero does not merely insult Decidius Saxa in some general terms, he obviously tries to make him—whom he almost always refers to merely as Saxa—appear to be of lower rank and standing than he actually was, vaguely alluding to his origin, the uncertainty of his citizenship, a position as centurio and to actors and procurers as his neighbours. These last remarks refer in fact to two members of L. Antonius’ commission of seven for the distribution of land, Nucula and Caesennius Lento, whom Cicero mentions several times together with Decidius Saxa (perhaps because he, too, was a member of that commission) and whom he tries to insult in a similar manner. It is part of Cicero’s strategy of disparagement, I think, that he assigns to Saxa the profession of a metator using a decempeda (14. 10), as he does to M. Antonius’ brother Lucius, whom he characterizes here with the odd-

16 8. 9: omnes Caiiones, omnes Saxae ceteraque pestes quae sequuntur Antonium aedis sibi optimas, hortos, Tusculana, Albana definitum. atque etiam homines agrestes, si homines illi ac non pecudes polius, inani spe ad aquas usque et Puteolos pervehuntur. 8. 26: cavet minis, aleatoribus, lenonibus: Caione etiam et Saxae cavet, quos centuriones pugnacis et lacertosos inter minorem et miamum greges conlocavit. Of Caio nothing definite is known (other references: 10. 22, 11. 12, 37, 12. 20); T. P. Wiseman, New Men in the Roman Senate 139 B.C. - A.D. 14 (Oxford 1971) 219 assumes that he was a member of the land commission of seven in 44 B.C.; D. R. Shackleton Bailey, Onomasticon to Cicero’s Speeches (Stuttgart 1988) 28 doubts this. I. Opelt, Die lateinischen Schimpfwörter und verwandte sprachliche Erscheinungen (Heidelberg 1965) has general comments on such crude insults as pecudes (143-44), without realizing that the words homines agrestes, si homines illi ac non pecudes polius and also rustici (10. 22) are meant to allude to Cafo’s and Saxa’s interest in “land.”


18 Other denigrating remarks: 11. 37 (ad facinus et praedam nati), 12. 20, 13. 2.

19 The full name is given at 13. 27 only. The cognomen Saxa, missing in I. Kaajanto, The Latin Cognomina (Helsinki 1965), also in H. Solin – O. Salomies, Repertorium nominum gentilium et cognominum Latinorum (Hildesheim 1988), is very rare; Shackleton Bailey (above, note 16) 100 records one other instance, Voconius Saxa, whom Cicero, however, simply calls Voconius.

20 Phil. 11. 12–13, 12. 20, 13. 2, 26–27; Nucula and Saxa: 8. 26; Syme (above, note 17) 39-40 suggests that Saxa was a member of the land commission of seven like Cafo (see above, note 16); Shackleton Bailey (above, note 16) 28 doubts this.

21 Cf. Phil. 8. 26, 10. 22, 11. 13: Nucula et Lento . . quorum alter commentatus est mimos, alter egit tragoediam; see Syme (above, note 17) 40.
sounding hapax legomenon decempedator (13. 37).\(^2\) Earlier he had insulted Lucius Antonius in general terms as fax, facinus, scelus, gurges, vorago (11. 10; see also 14. 9),\(^3\) as latro Italae (12. 20) or taeterrima belua (12. 26), but in introducing him in the third Philippic he describes him as ex myrmillone dux, ex gladiatore imperator (31); though Cicero repeats this charge several times (5. 20, 6. 10, 13, 17, 12. 20; see also 5. 30) no one would ever take such remarks seriously and use them as evidence for L. Antonius’ origin or rank. Similarly, everything Cicero says here about Nuclea, about Lento,\(^4\) and, indeed, about Saxa has to be taken as what it is: polemics. One may conclude, therefore, that Decidius Saxa—whatever his origin, whatever his position in the army—was no more a land surveyor than L. Antonius (a land surveyor or a gladiator); he may, however, well have been a member of L. Antonius’ commission charged with the division and distribution of land to veterans, or he must have been responsible for some similar activity; otherwise the particular colouring of Cicero’s polemics would be meaningless.\(^5\)

The conclusion we may draw from our observations so far is that our sources seem to say something about (minor) officials responsible for the organization and supervision of the surveying of land, but that they seem to say nothing about the people themselves who actually do the job, their training. This obviously calls for an explanation, and we have to ask (a) what is known about the agrimensores during the imperial period, (b) what is known about the surveying itself, (c) what kind of special knowledge and/or technical skill is expected of the agrimensores.

III

Of those who were active as mensores (agrimensores) in the following decades and centuries a good many were freedmen.\(^6\) Whether they performed the duties which Rullus planned to assign to the finitores seems

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\(^2\) Cf. Cic. Mil. 74, where Cicero uses decempeda for the first time in a description of Clodius, which is instructive, as it refers to architects and the surveyor’s instruments in connexion with Clodius ignoring the rights of other people and the boundaries of their property. For other references to L. Antonius as being responsible for the allocation of land, see 5. 7, 6. 13–14, 7. 17–18, 11. 10, 13. 37.

\(^3\) For parallels of such general terms of abuse, see Opelt (above, note 16). For other aspects of Cicero’s attacks on L. Antonius, see Phil. 3. 31, 5. 20, 25, 6. 10–15, 7. 16–18, 10. 4–5, 21–22, 11. 10, 36, 12. 14, 20, 26, 13. 2, 4, 10, 26, 37, 49, 14. 8–9.

\(^4\) The practice of insulting people by ascribing a low-class profession or activity to them or their parents (father) is old; cf. W. Süss, Ethos: Studien zur älteren griechischen Rhetorik (Leipzig 1910) 247–49; Opelt (above, note 16) 151, who fails to register gladiator, lanista, myrmillo and, of course, metiator and decempedator in the section “Kritik am Privatleben des Politikers.”

\(^5\) This seems to have been overlooked by Shackleton Bailey (above, note 16) 28.

\(^6\) Cf. Schulten (above, note 1) 1891; see also Hinrichs’ list (above, note 1) 158–62 (158: for C 3, 3343 read 3433); Dilke (above, note 1) 39 with 50.
uncertain;\(^2^7\) if they did, the question as regards the actual surveyors would still be unanswered (in view of our earlier observations), if they did not, one wonders to what extent the actual surveying was carried out in republican times by freedmen and slaves also, or was considered to be a craftsman's profession.\(^2^8\) Would and could that be reconciled with the very wide range of knowledge seemingly required for this job? Do our sources offer any help?

Surveying was done for various purposes, military, religious, administrative. Polybius and Caesar both mention centuriones charged with such a duty,\(^2^9\) but neither even hints at any special training they may have had or at any kind of assistance. The list of nomina agrimensorum in the first book of the Liber Coloniarum is headed by a soldier (miles), Satrius Verus.\(^3^0\) While this passage does not refer to work for the army, it may point to people of low social standing being capable of and responsible for actual surveying. Of the details of surveying for religious purposes too little is said in our sources, and the same applies to the use private individuals made of it. The latter, in particular, may be regarded as an indication that it was a rather ordinary occupation which one did not talk about. However, the practice of surveying for official purposes deserves further attention.

On the one hand we hear of surveying of land being leased on the basis of contracts at the time of the second triumvirate, on the other hand we hear three generations earlier of the demand for arbitration by high officials\(^3^1\) and at the same time and a little later of extensive redistribution of land, of foundation of colonies and allocation of land to veterans, political measures which made a great deal of surveying of land necessary.\(^3^2\) Obviously, it was neither possible for the magistrates and officials to do all the field-work

\(^{2^7}\) This seems to be the view of Rudorff (above, note 9) II 320–23; more careful: Dilke (above, note 1) 35–37; Schulten (above, note 1) is not clear, compare 1887 with 1889. When Nonius, who is usually quoted in this context, says (p. 11 M) finitores dicebantur quos nunc agrimensor(es) dicimus: dicti quod finis dividerent, we can conclude that the area of responsibility of the (agri)mensor(es) grew during the Empire, while there was no more room for finitores (the term actually disappears).

\(^{2^8}\) The uncertainty is most obvious in Rudorff's remark (above, note 9) II 320: "Das Feldmessen war damals gleich der Rechtshunde eine freie Kunst, welche ohne vorherige Prüfung wissenschaftlich von Freien, praktisch auch wohl von Schläfen, umsonst, später gegen ein honorarium geübt wurde.”

\(^{2^9}\) Cf. Polyb. 6. 27–32, 41, 42, Caes. Gall. 2. 17. However, it cannot be proved and is, in fact, most unlikely that the art of surveying land originated from and was first developed in the army, as e.g. Hinrichs (above, note 1) 81–84 seems to argue; for the religious foundations, see above (note 7).

\(^{3^0}\) Feldmesser (above, note 2) I 244; there are also later examples both in the following list and in inscriptions.

\(^{3^1}\) Cf. Feldmesser (above, note 2) I 212.4–13.5; CIL V 7749 (= I² 584 = ILS 5946 Dessau); see Dilke (above, note 1) 36–37, 100.

\(^{3^2}\) See Dilke (above, note 1) 35–37; H. Galsterer in Feldmefikunst (above, note 1) 412–28.
themselves,\textsuperscript{33} nor for the surveyors to be burdened with the responsibility for the solution of all legal questions involved. And when one looks at the lists of particular topics and aspects of the work which Schulten and Dilke assume surveyors must have been familiar with, one wonders whether there was anyone during the time of the Republic whom one could have called an expert in all these fields.\textsuperscript{34} A division of labour was the obvious answer, and I wish to argue here that it did in fact originally exist and last for a long time. Only gradually, it seems, the change from the republican to the imperial system of administration with paid officials and the ever-increasing demand for surveying brought the two branches, as it were, together more closely, as is also shown by the collection of writings on land surveying.\textsuperscript{35} But during the Republic the work of the actual surveyors of land was clearly quite distinct from that of supervisors or arbitrators, and consequently the training of surveyors was not comparable to that of lawyers.

One has to assume the existence of two different groups of people with different kinds of knowledge: On the one hand there are technical skill, geometrical competence, ability to orientate oneself in the country, to put up one’s instruments, to measure distances and to make use of astronomy—this and this kind of thing was not part of the “liberal arts” and a young knight could not be expected to have mastered all of it. When Cicero says, \textit{nos metiendi ratiocinandique utilitate huius artis} (i.e. geometriae) terminavitum modum, he does not mean to imply that it was customary in his time for well-educated young people to acquire as much geometrical knowledge as an actual surveyor of land was expected to possess. Nor should we allow ourselves to be misled by the account Vitruvius gives of an ideally educated architect, for he does not claim to represent reality, while what Columella says “of the type of mathematics used by a gentleman farmer in the first century A.D.” would not have enabled the land surveyors to be as accurate as they actually were.\textsuperscript{37}

In acquiring legal knowledge some knights may have paid special attention to the particular aspects and issues raised by disputes over

\textsuperscript{33} Note Dilke (above, note 1) 35: “it is reckoned that between the years 200 and 190 BC a million \textit{iugera} of land were distributed to 100,000 families.” Scholars do not seem to have considered the question by whom this enormous amount of field-work was carried out.

\textsuperscript{34} See Schulten (above, note 1) 1895; Dilke (above, note 1) 47–65, but also the following chapters (esp. 66–81, 82–97) and his contribution in \textit{Feldmeßkunst} (above, note 1) 337–46, as well as the contributions in the same volume by W. Hübner (140–70) and M. Folkerts (311–34).

\textsuperscript{35} Some are concerned mainly with the practical aspects, others with legal aspects, others with both; see on the gradual growing together of the major aspects of land surveying Schindel (above, note 1) 389–92, also Dilke (above, note 1) 51.

\textsuperscript{36} See Dilke (above, note 1) 51–63 and above (note 34).

\textsuperscript{37} Dilke (above, note 1) refers first to Vitruvius (1. 1. 3–10) 48 and 51, then to Columella (5. 1–2) 52–56; but see Schindel (above, note 1) 376–78, 388; in view of the few scholars competent today to understand all the details of surveying I doubt that in Rome the specialized knowledge could be acquired entirely without some kind of instruction, possibly rather informal.
boundaries, the quality of land etc.; thereby, they may have recommended themselves for particular assignments at the beginning of their career. But to have the necessary knowledge of the technical side, obviously, was the business of a different class of people, craftsmen who made their expertise available to others for money, like members of other paid professions. This is the reason we hear so little about their training, about the way they acquired their knowledge and passed it on to others; it lay outside the education of free-born young men. Thus land surveyors, like architects and engineers and others, fall below the level of literature in the narrow sense, and it is due to mere chance, i.e. the particular interest of an individual, that we know as much as we do know about so many details of the work of the agrimensores. For one may doubt whether the other works of the corpus agrimensoorum, mostly meant for practical use, would have been preserved had they not been put together with the work of Frontinus.\(^{38}\)

However, the fact that Frontinus does not give much information about the training of land surveyors should not be interpreted to mean that there was either little or no training at all. On the contrary, the complexity of the methods of land surveying and the accuracy of the results actually achieved by the agrimensores together with some of the treatises in the corpus agrimensoorum, the nature of which Ulrich Schindel has carefully analysed, not least the illustrations, make it most likely that the practice of land surveying was learned through working with and imitating surveyors actually doing the job and from books with their illustrations.\(^{39}\)

In summing up we may state that it is somehow misleading to speak of agrimensores in general for the period of the Republic. It seems preferable to distinguish between those who did the practical work of surveying and those who had some knowledge of the legal aspects involved and, therefore, appeared to be especially well prepared for arbitration or settlement of disputes over boundaries. The latter acquired their knowledge in the same way as all lawyers did in Rome; the former were trained, like all craftsmen, in a manner about which we are not too well informed, because it was not found worthy of mention, let alone full treatment in literature. But the later handbooks make us realize that a training entirely without theoretical

\(^{38}\) On Sex. Iulius Frontinus (about 30–104 A.D.), see W. Eck, “Die Gestalt Frontins in ihrer politischen und sozialen Umwelt,” in Iulius Frontinus, Curator aquarum: Wasserversorgung im antiken Rom (Munich 1983) 45–77. The form in which Frontinus’ work on land surveying survived—in fragments with a commentary by a later author and combined with other rather heterogeneous, but for a practitioner useful material—beautifully illustrates the nature of this profession and the manner in which expertise was passed on.

\(^{39}\) Schindel (above, note 1) 378–80 stresses that there was no organized teaching of land surveying and characterizes Frontinus’ work as meant “zum Gebrauch und Selbststudium des in der ars mensorialis Tätigen” (380; see also 392–94); but there is no reason why such writings should be used for “Selbststudium” only and not also for the instruction of an apprentice by the master; this may well be assumed, even though there is no trace of a dialogue between teacher and pupil in the agrimensores—which is characteristic for subjects taught in a classroom.
instruction and without some drawings and written *formulae* is highly improbable.

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