

AMMIANUS' UNDERGROUND PIPES AT 17.7.11*

Keywords: Ammianus Marcellinus, Earthquakes, Greek technical terminology

Near the beginning of his scientific excursus on earthquakes Ammianus Marcellinus offers as one explanation,

Accidunt ... aut in cavernis minutis terrarum, quas Graece σύριγγας appellamus, impulsu crebriore aquis undabundis ... (17.7.11)

before proceeding to an exposition of the explanation he favours more, that they are caused by winds.

Editors and commentators have neglected to comment on the Greek term deployed here, presumably because they regard it as unproblematic.¹ Yet the term does invite some questions.

The first is that the Latin and Greek terms (*cavernae*, σύριγγες) do not denote an equivalent semantic field. We might expect Ammianus to have used a Latin term which would also mean ‘pipes’ or ‘tubes’ (such as *fistulae*). Admittedly, this is not in itself sufficient cause for objection.

The second, and more striking, feature of the text is that Ammianus seems to be unique in deploying the Greek term σύριγγες to denote aspects of subterranean geology which are relevant to earthquakes. In earthquake accounts by other Latin writers one finds a variety of terms used to denote spaces or passages beneath and into the earth,² but the closest any of them come to the notion of pipes / tubes is

*) I should like to thank Gavin Kelly, Alan Ross, and Matthew Shelton for supplying me with bibliographical material which was not available in my country. I am also grateful to the editors and anonymous reviewers for their invaluable suggestions.

1) P. de Jonge, *Philological and Historical Commentary on Ammianus Marcellinus XVII*, Groningen 1977, 205 accepts the term without question, since the word may denote “... a rift in the earth, a cave, or a mine” (no references are given in support of this).

2) Seneca, *QNat.* 6, devoted to the subject of earthquakes, provides a good representative sample of the terms which are routinely employed: (involving subterranean water) *uastis ... receptaculis* 6.7.3; (Archelaus and the action of wind) *in concava terrarum* 6.12.1, *angustias* 6.12.2, *inferna sede* 6.12.2; (Aristotle and Theophrastus on *evaporatio* and *spiritus*) *per angusta* 6.13.1; (Straton’s theory of the action of hot and cold on air) *omnes sub terra recessus* 6.13.3, *in cavernis* 6.13.4, *in angustum* 6.13.4; (theory based on analogy with human anatomy) body fluids and blood proceed *per sua itinera* 6.14.1, *quaedam angustiora receptacula animae* 6.14.1, *viam* 6.14.3, *rimam* 6.14.3, *cavernam* 6.14.4; (of air-filled spaces) *speluncarum sub terra pendentium uastitas* 6.19.2; (Democritus on both *spiritus* and water) *aliqua*

when an analogy with the human body is exploited to explain the geological processes which underlie earthquakes (*venae* of body and earth in Sen. QNat. 6.14.2, and 6.18.6),³ or when the processes of ‘boring’ and ‘perforation’ are employed (*terra multis locis perforata est* Sen. QNat. 6.15.1, *spiritus intrat terram per occulta foramina* 6.23.4, *utrum per tenuia foramina nec oculis comprehensibilia an per maiora ac patentiora* 6.24.1, [sc. *spiritus*] *tenui foramine fluens* 6.28.2). Although one might argue that such terms could denote ‘pipe-like’ structures, they are still not quite the same as ‘pipes’.

The term does not seem to appear in Greek explanations of earthquakes either.⁴ The noun σύριγξ is certainly applied to passages, corridors, walkways, and galleries, some of which are located underground or in the interior of something. A survey of the instances of the word deployed with this sense assembled usefully by Stein⁵ indicates that all refer to structures created by human agency,⁶ not natural passages. The largest number of instances in Stein’s collection (thirty-one examples presented on pages 290–97) comprises inscriptions and graffiti which record visitors’ viewings and admiration of the subterranean passages (σύριγγες) in the ‘Valley of the Kings’.⁷ Ammianus himself, in an excursus on selected wonders of Egypt, uses

pars terrae concaua est 6.20.1, *in subiacentem cauernam* 6.22.2, *in cauernis ingentibus* 6.24.3, *uacuum terrarum locum* 6.25.1, *laxos specus* 6.25.3, *concauas rupes et saxa peruia* 6.26.3. Pliny has *vel cauernarum vel cuniculi* HN 2.193. Lucretius speaks of *ventosis ... speluncis* 6.537–38, *ingentis speluncas* 6.545, *loca subcava terrae* 6.557, *speluncas ... altas* 6.559, *loca cava terrai* 6.580, *speluncas ... magnas* 6.581.

3) Cf. (of the earth) *condito ... in venas et cava eius occulta flatu* Plin. HN 2.192.

4) The closest terminological parallel occurs in Aristotle’s account of the prevalence of earthquakes in certain coastal locations in *Meteorologica* 2.8 366a27–28 *δοκεῖ γὰρ διαυλωνίζειν ὑπὸ τὴν γῆν ἢ θάλαττα*; the verb suggests an analogy with the aulos, to illustrate the effects of water pressure on the pneuma. Elsewhere in the same account Aristotle uses the adjectives *σομφός* (366a25, 366a33–366b1) and *ὑπαντρος* (366a25), speaks of *πληρουμένων τῶν κοιλιῶν ὕδατος* (366b12), and vaguely of *τοὺς κάτω τόπους* (366b1).

5) O. Stein, Σύριγγ und suruṅgā, *Zeitschrift für Indologie und Iranistik* 3, 1925, 280–318.

6) E. g. screened or covered trenches connected with siege works Polyb. 9.41.9, 21.28.4, 21.28.6, a covered gallery with intervening gates at Alexandria Polyb. 15.30.7, 15.31.3, a corridor in a ship separating men’s and women’s quarters Ath. 5.38 205d, a passage into one of the pyramids Strabo 17.1.33. See also Strabo’s report that a σύριγγ was constructed through both towers on either side of the bridge over the Euripus near Chalcis 9.2.8.

7) Stein used the edition of J. Baillet, *Inscriptions grecques et latines des tombeaux des rois ou syringes à Thèbes, Cairo 1920–1923* (*Mémoires de l’Institut français d’archéologie orientale du Caire* 42). Pausanias 1.42.3 speaks of τὰς Σύριγγας καλουμένας near Thebes, Aelian 6.43 of σύριγγας Αἰγυπτίας, and Heliodorus, *Aeth.* 2.27.3 of the Egyptians’ σύριγγες. The Greek word is also used in a painted Latin graffito, Baillet no. 1257

this term and glosses it as *subterranei quidam et flexuosi secessus* (22.15.30). Most of the texts listed above not only concern human-made structures but also often focus in some way upon the ingenuity and skill required in their construction.

A term which recurs in earthquake explanations, however, is *σήραγγες* (LSJ s. v. *σήραγξ* ‘cave hollowed out by water’, ‘hollow rock’, and also ‘sponge-like pores of the lungs’, ‘medullary cavity of a bone’), which bears a formal resemblance to the word *σύριγγες*.⁸

Clearly the Greek word *σήραγγες* is closer in meaning to the Latin *cavernae*, and the one which recurs in Greek earthquake accounts. Unlike *σύριγγες*, the term *σήραγγες* seems to be reserved for natural cavities in both medical and geological writing.⁹ Ammianus’ choice of *σύριγγες* at 17.7.11 is therefore something of a surprise.

8) Thus Aëtius, *Placita* 3.15.11 (in the summary of Epicurus’ view of earthquakes) *ἐνδέχεσθαι δὲ καὶ σηραγγώδη τοῖς κατωτέρω μέρεσι καθεστῶσαν ὑπὸ τοῦ διασπειρομένου πνεύματος εἰς τὰς ἀντροειδεῖς κοιλότητας ἐπίπτοντος σαλεύεσθαι*; Aristoteles, [Mund.] 395b30–33 *πολλάκις δὲ καὶ συγγενὲς πνεῦμα εὐκρατον ἐν γῆ παρεξώσθην εἰς μυχίους σήραγγας αὐτῆς, ἔξεδρον γενόμενον ἐκ τῶν οἰκείων τόπων, πολλὰ μέρη συνεκράδανεν* (note Apuleius’ version of this passage *saepe accidit ut nativi spiritus, per terrae concavae partes errantes, concuterent solida terrarum*, *De mundo* 18; R. von Scala, *Doxographische und stoische Reste bei Ammianus Marcellinus*. Ein Beitrag zur Geschichte der allgemeinen Bildung des 4. Jahrhunderts des n. Chr., in: *Festgaben zu Ehren Max Büdingers von seinen Freunden und Schülern*, Innsbruck 1898, 134 already set the pseudo-Aristotelian passage next to that of Ammianus, and noted the manuscript variant *σύριγγας*, but did not comment on the implications of this parallel for the text of Ammianus); Strabo 9.2.16 (on the interior plains of Boeotia) *ὑπάντρον δὲ καὶ σηραγγώδους οὕσης κατὰ βάθους τῆς γῆς, σεισμοὶ γινόμενοι πολλάκις ἐξαισίοι*; Cornutus, *Theol.* 42 *τὴν εἰς τὰς ἐν τῇ γῆ σήραγγας ἔμπτωσιν τῆς τε θαλάττης καὶ τῶν ἄλλων ὑδάτων*; Arius Didymus fr. 13 *συμβαίνειν δὲ καὶ τὰ μυκήματα ποτὲ μὲν μετὰ σεισμῶν, ποτὲ δὲ καὶ χωρὶς, τοῦ πνεύματος ἠχοῦντος, ὥστ’ ἐξακούεσθαι ψόφον τινὰ καὶ βόμβον ἐπὶ μήκιστον, ὅποτε διὰ τῶν σηράγγων διαυλοδρομεῖ παρατριβόμενον μηδ’ ἐξίόν*; John Lydus, *Ost.* 53 *ἡ τῶν σεισμῶν γένεσις πνευμάτων ἐστὶ ξηρῶν διὰ σηράγγων ἰόντων*; Nonnus, *Dionysiaca* 2.39–41 (the rage of Typhoeus has seismic effects) *καὶ χθόνια σήραγγες ἐβόμβεον, ἔτρεμον ἄκραι / ἠόνες, σεῖοντο μυχοὶ καὶ ὀλίσθανον ὄχθαι / λουμένης ψαμάθιο ποδῶν ἐνοσίχθονι παλμῷ*; Olympiodorus, *In Aristotelis categorias commentarium* 124.29–31 *οὕτω δὴ καὶ ἡ γῆ καὶ πυκνὴ λέγεται εἶναι καὶ μανῆ πυκνὴ μὲν ὡς δυσπαθῆς μανῆ δὲ ὡς ἔχουσα σηραγγώδεις* (Olympiodorus uses this adjective in connection with earthquakes in his commentary on Aristotle’s *Meteorologica* as well, 11.20–21) *καὶ διακένους τόπους, ὡς δηλοῦσιν οἱ σεισμοὶ οἱ γινόμενοι ἐν τούτοις πνεύματος ὑπολαμβανομένον*.

9) One notes that Heliodorus uses a verbal derivative of the noun *σήραγξ* when making a pointed distinction between a natural cave and a constructed grotto, τὸ δὲ [sc. τὸ ἄντρον] ἦν οὐ φύσεως ἔργον οἶα πολλὰ περὶ γῆν τε καὶ ὑπὸ γῆν αὐτόματα σηραγγόυται ἀλλὰ τέχνης ληστρικῆς τὴν φύσιν μιμησαμένης *Aeth.* 1.28.2.

Yet the manuscripts of Ammianus, as reported in the apparatus of modern editions, only offer *syringas* at 17.7.11. There are two possible explanations for this. The first, that Ammianus himself confused the terms *σήραγγες* (normally ‘natural cavities’) and *σύριγγες* (normally ‘passages created by human intervention’), both because of the celebrated Egyptian *σύριγγες* and the similarity between the two words. The alternative is that the term *σύριγγες* is to be attributed to an error, or an intervention, within the scribal tradition. Since there is evidence that even Greek scribes confused the words *σήραγγες* and *σύριγγες*,¹⁰ it would not be surprising if a Latin copyist transmitted the more familiar Greek *σύριγγες* in place of *σήραγγες*. I am inclined to think that the second alternative is more likely, particularly since Ammianus pointedly offers, in place of the Latin word *cavernae*, a Greek term derived from established scientific and philosophical discourse on earthquakes. Ammianus would thereby emphasise that earthquakes are produced by natural features and processes, even if the human intellect is denied a passage to their complete comprehension.¹¹

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10) See apparatus of W. L. Lorimer, *Aristotelis qui fertur libellus De mundo*, Paris 1933, 72 for alternative manuscript readings for *σήραγγας* at Arist. [Mund.] 395b31: *σήραγγας*, *σύρυγγας*, *σήριγγας*, and *σύριγγας*! If G. Sabbah, *Ammien Marcellin. Histoire Tome 2 (livres XVII–XIX)*, Paris 1970, 178 is justified in speculating that Ammianus is making direct reference to Arist. [Mund.] 395b30–396a14, or if Ammianus was using a source that had knowledge of the same passage in pseudo-Aristotle, then the manuscript used possibly already had *σύριγγας* instead of *σήραγγας* at 395b31. De Jonge (n. 1 above) 199 on the other hand, believes that the Aristotelian corpus would have been accessed only indirectly by Ammianus in this excursus. D. den Hengst, *The Scientific Digressions in Ammianus’ Res Gestae*, in: J. de Boeft / D. den Hengst / H. C. Teitler (eds.), *Cognitio Gestorum. The Historiographic Art of Ammianus Marcellinus*, Amsterdam 1992, 44 remarks that although Ammianus is anxious to show off his knowledge of Greek technical vocabulary, this should not be thought to prove that he used Greek handbooks.

11) As Ammianus states at the beginning of his excursus on earthquakes, *ad ipsius enim veritatis arcana, non modo haec nostra vulgaris inscitia, sed ne sempiterna quidem lucubrationibus longis nondum exhausta physicorum iurgia penetrant*, 17.7.9.