

MARTIAL 1. 41: SULPHUR AND GLASS

Urbanus tibi, Caecili, videris.
non es, crede mihi. Quid ergo? verna,
hoc quod transtiberinus ambulator,
qui pallentia sulphurata fractis
permutat vitreis...

You seem urbane to yourself, Caecilius.
But believe me, you are not. What are you then?
A home bred slave, a kind of man like a Transtiber ragman,
Who exchanges white sulphur
For broken glass...

The interpretation of both the sulphur offered by the *ambulator* in line 3 and the glass he collects in exchange has long been a problem. Post's opinion, offered in 1908,¹ that broken glass could be, and was, mended with a sulphur glue has been subsequently eclipsed by scholars such as Leon and Smyth.² They correctly discerned that Pliny, in *HN* 29.11.51 and 36.67.199, adduced by Post, does not refer to a sulphur-based adhesive, nor does Pliny suggest sulphur has any such property. Basic problems persist, however, which have not been properly resolved by recent commentators on Martial,³ regarding the form and function of sulphur as well as technical and cultural changes which would have bestowed some value on broken glass. New evidence and rarely cited evidence can be brought to bear on the earlier suppositions, which Citroni and Howell repeat, in order to solve the riddle of Martial 1.41 and add to our knowledge of ancient society.

Forbes and Harden,⁴ among others, have shown that, although glass could possibly be fitted together by melting the fracture planes, sulphur is not able to produce a high enough temperature for fusion.⁵ Likewise, a greater interest in Roman technology has yielded an understanding of what adhesives were available, and for what materials they were intended. So, for instance, a recipe for glue given by Pliny (egg white plus lime) might repair glass, but the bonding would not have been strong enough to allow regular use, only display. Cato, in *De Agricultura* 39.1–2, does mention a plaster which required sulphur, but it was only effective in repairing large earthen vessels. An examination of other Latin words for bonding, such as *ferrumen*,⁶ *gluten*,⁷ and

¹ Edwin Post, *Selected Epigrams of Martial* (Norman, Oklahoma, 1908 [1967]), p. 21.

² See H. J. Leon, 'Sulphur for Broken Glass', *TAPA* 72 (1941), 233–6, and W. R. Smyth, 'Statius, *Silvae* 1.6.73–4 and Martial 1.41.3–5', *CR* 61 (1947), 46–7.

³ The most recent editions of Book 1 of the *Epigrams* are by Mario Citroni, *M. Valerii Martialis, Epigrammaton Liber I* (Firenze: La Nuova Italia Editrice, 1975), and Peter Howell, *A Commentary on Book One of the Epigrams of Martial* (London, 1980).

⁴ See R. J. Forbes's article on glass in *Studies in Ancient Technology* (Leiden, 1966), 5, pp. 112–241, and D. B. Harden, 'Ancient Glass II: Roman', *AJ* 126 (1969), 44–77.

⁵ Roman glass of the first century A.D. melts at 770°–805 °C (Forbes, p. 225).

⁶ Related to *firmus* (through *bher), and not *ferrum*, as might appear at first glance; it describes both soldering and caulking.

⁷ This term refers to gums and animal gels for closing wounds, but is also applied to knitting fractured bones.

viscum (bird-lime)⁸ indicates that the ancients did not develop a glue strong enough to restore a repaired glass to its original service.

Nor was it essential, because of recent developments in the glass industry. The technique of blowing glass, discovered about 50 B.C.,⁹ quickly made glass everywhere available and inexpensive. Formerly, a limited number of centres produced mould-formed glass, which was labour-intensive and required a longer period of time to manufacture; now, many local factories were started,¹⁰ which also reduced shipping charges greatly. The growth in glass trade and ownership inevitably brought in its train enough breakage to make its collection worthwhile.

Leon (p. 236) has suggested that shards could be melted into cullet, and combined with some new glass in further manufacture, in much the way that old paper is made into newsprint, a view with which Forbes (p. 115) concurs, although direct contemporary evidence is lacking. The advantages are obvious – glass melts at a lower temperature than required to produce it, and several preliminary steps, such as sifting and washing, can be by-passed. Many glass products which are common today, however were unknown then or were produced from other materials: windows, for example, were apparently made of selenite and not glass, as the remains at Ostia have confirmed.¹¹

It was Smith (p. 46) who, expanding upon Leon, was the first to argue that mosaicists would have bought and re-fashioned broken glass. Some cast glass had been substituted for pebbles or marble chips in the Hellenistic period in order to attain unusual colours, as the eyes of men and beasts, or fill awkward spaces, and mosaics incorporating large amounts of glass, if not common, were not unknown. The discovery of glass mosaics at Cenchreae,¹² a small, local port near the canal of Corinth, may indicate that such mosaic programmes were not prohibitively expensive. Molten cullet could be poured into moulds which would automatically yield regular shaped and flat *tesserae*, an improvement over marble cutting, and with far less labour.

The difficulty of this interpretation is not one of probability, as Howell (p. 194) objects, but one of scope; for the proposal to be credible, one must demonstrate a sufficient popularity of glass in mosaic or other, similar, work. The large-scale programme at Cenchreae is an early indication; further, glass mosaics often appear on walls, as early as 58 B.C.,¹³ and almost exclusively on vaults.¹⁴ Glass *tesserae*, for obvious reasons, would have been preferred in fountains, as is lavishly attested at Pompeii, and in *thermae*, for their ability to retain heat and reflect light in addition to being waterproof.¹⁵ Although there is evidence that jagged glass was cemented into the earliest wall and vault mosaics (Sear, *Vaults* 22, 40), *tesserae* were becoming the norm by the time of Martial.

Sulphur, like glass, was a much more versatile material than is sometimes believed,

⁸ Specialized terms, such as *concretum* and *cementum*, need not be considered.

⁹ The date, given by Harden (p. 74), is approximate; he credits the Syrians with the discovery. Forbes (pp. 159–60) prefers a slightly later date and would locate its development at Alexandria.

¹⁰ Workshops sprung up in Campania, Northern Italy, Cologne, and even Britain in the years between A.D. 25 and 60 according to Harden (pp. 49–50); see also Jennifer Price, 'Glass', in *A Handbook of Roman Art*, ed. by Martin Henig (Oxford, 1983), pp. 205–19.

¹¹ See George M. A. Hanfmann, *Roman Art* (New York, 1975), p. 68. Harden (p. 46) knows of no glass windows which can be dated earlier than the middle of the second century A.D.

¹² Published by R. Scranton in *Archaeology* 18 (1965), 191–200 and 20 (1967), 163–73.

¹³ Price, p. 218, and Frank Sear, 'The Earliest Wall Mosaics in Italy', *PBSR* 30 (1975), 83–97.

¹⁴ Frank Sear, *Roman Wall and Vault Mosaics* (Heidelberg, 1977), also gathers the extensive literary evidence for the popularity of glass mosaics in the early empire.

¹⁵ Cp. Statius, *Silvae* 1.5.42 and Lucian, *Verae Historiae* 2.11.

and provided for a multiplicity of needs in everyday life. The context of 1.41 makes it clear that the itinerant ragman was exchanging small quantities of sulphur and glass, as all of the other people mentioned are menials and small, disreputable merchants; thus, more specialized uses may be excluded, such as the ageing of silver (Pliny, *HN* 33.46.131), the extraction of gold from silver, and the reduction of large amounts of lead for medicines (Pliny, *HN* 34.50.167). The urban setting of the poem discourages one from pursuing such agricultural applications as a caterpillar repellent (Cato, *De Agr.* 95), and an ointment for sheep (Vergil, *Georg.* 3.449).

The most common translation of *sulphurata* as 'matches' rests on an inference from an anachronistic interpretation by Morgan in 1890¹⁶ of two other passages in which the noun *ramentum*, absent here, occurs. Leon and Smyth, again following Post, assume that the particular function of sulphur in 1.41 is the same as that assigned by Morgan for Seneca, *Naturales Quaestiones* 1.1.8 and Martial 10.3.3. The question which begs itself is whether *ramentum*, a 'splinter' or 'shaving', even when coated or impregnated with sulphur, can be taken to imply a match.

It seems unlikely since percussion, or friction, matches were not developed until the nineteenth century;¹⁷ the 'sulphured stick' must, therefore, have been a fire starter meant to catch the spark from pyrites and flint, or ignite as a result of heat produced by fire-drills. Passages in Pliny¹⁸ and Columella¹⁹ would appear to confirm this view: a sulphured splinter, surrounded by dried foliage and fungi, would be preferable to powdered or ground sulphur in the open. The choice of *ramentum* seems significant in this regard; *scobes* is the proper term for iron filings and sawdust, and would be more appropriate if grain or loose sulphur were meant.

Seneca clearly is not thinking of matches when, in a corrupt passage,²⁰ he states that 'among us splinters laden with sulphur draw out a fire *ex intervallo*',²¹ while approving of the Lucretian doctrine of the renewal of the sun by corpuscles thrown up from earth. If *ex intervallo* signifies an extent of space, as it often does, then the passage would seemingly refer to fire starters which would help guide a fire from one point to another. The phrase, however, can also refer to the duration of time, an interpretation which the context would allow, and would, therefore, allude to the routine practice of banking fires.²² Pliny mentions that there were four types of sulphur available in antiquity, and that the coarsest grade was smeared on lamp wicks, presumably to help the wick ignite and keep burning, but at a slow rate. Seneca's 'sulphured splinters' might, thereby, as easily promote fire retention as expansion; only fire starting is ruled out.²³

One might thus posit that Martial 1.41 describes chemically treated fire logs if it were not that *Epigram* 10.3 has been much misunderstood. At face value, the context

¹⁶ Morris H. Morgan, 'De Ignis Eliciendi Modis apud Antiquos', *HSCP* 1 (1890), 13–46; written in Latin.

¹⁷ See Forbes, 'Heat and Heating', in *Studies in Ancient Technology* 6, pp. 6, 9, and also fuller studies such as Warren N. Watson's 'Methods of Fire Making Used by Early Man', *Journal of Chemical Education* 16 (1939), 36–45, and M. F. Crass's 'A History of the Match Industry', *Journal of Chemical Education* 18 (1941), 116–23.

¹⁸ *HN* 16.77.208; cp. Forbes, 6, pp. 10–11.

¹⁹ *De re rustica* 12.19.3; cp. Ovid, *Metamorphoses* 3.374.

²⁰ Some manuscripts read *fragmenta* and others *stramenta* for *ramenta*, and *aspera* is found for *adpersa*.

²¹ *nam apud nos quoque ramenta sulphure adpersa ignem ex intervallo trahunt* (*NQ* 1.1.8).

²² I.e., 'splinters laden with sulphur prolong a fire over a period of time'.

²³ Pliny's allegation that sulphur was used on lamp wicks is clearly a misunderstanding on his part. A lamp wick of sulphur would burn with an acrid, smoky flame, and would supply little illumination. This does not, however, affect the truth of Seneca's statement.

of lines 2–3²⁴ seems to parallel 1.41.2–5 so closely that *ramento*, there openly modified by *sulphurato*, almost demands to be supplied in 1.41. A closer examination reveals, however, that Martial, once he became well known and respected, was plagued by forgers. The point of *Epigram* 10.3 is that this impostor, like so many poseurs, has not got it quite right, which makes the interplay with 1.41 apt, since Caecilius is also a man of the same ilk.²⁵

The first four lines of *Epigram* 10.3 list some of the kinds of phrases and images which the impersonator has lifted from Martial as part of the charade; Martial artfully exposes the limits of the charlatan's genius by drawing attention to the slight changes in language. Thus, the diminutive *vernaculorum* stands in line 1, although only the simplex occurs elsewhere in Martial, and is never joined to a word for speaking. So, too, there is the small but revealing inaccuracy in detail: *Maximina* (another fraud) in 2.41, the obvious point of comparison with 10.3, has three teeth, not one, and they are not styled as *sordidum*; the adjective is nowhere applied to teeth. There is a visible slip in line 3 – the feminine *circulatricis* has been substituted for the masculine *ambulator* – although the couplet holds up to ridicule the attempt by a hack to rival or out-do a master. The hawker in this version, then, curses, and the glass is given a brand name. It is, therefore, probable that the extra detail, *ramento*, is added not only because it was not intended in 1.41, but to show that it was wrongly inferred by the plagiarist.

The kind of sulphur which was being offered by the hawker in 1.41 is the purest grade, and the decisive detail, overlooked by the impostor in his rush to embellish, is the adjective *pallentia*. *Pallens* in its main sense of 'pale, or greenish' fits Pliny's description of *vivum*, the only one of the four sulphurs which was worked in a solid form, as *tralucesque et viret*.²⁶ It also would have been more attractive as a trading item, and hence a greater inducement to save broken glass temporarily rather than throw it away, because it had more beneficial properties than either *egula* or *glæbum*.

Egula, according to Pliny,²⁷ bleached and softened wool by smoking from beneath, a process which is now known to work through the action of sulphur dioxide (SO₂). It is possible that this type of sulphur was, therefore, the one employed in fumigation²⁸ and, possibly, by extension, in religious rite and magic,²⁹ although one might expect

²⁴ The first six lines read:

vernaculorum dicta, sordidum dentem,
et foeda linguae probra circulatricis,
quae sulphurato nolit empta ramento
Vatiniorum proxeneta fractorum,
poeta quidam clancularius spargit
et volt videri nostra. credis hoc, Prisce?

²⁵ Indeed there may be reason to believe that Caecilius is the 'clandestine poet' (10.3.5) since 1.41.20, preserving one of the few jokes in Persius, states that the would-be poet was only a *caballus*. In Martial, the direct comparison with Tettius Caballus gives it an extra layer of meaning.

²⁶ Pliny, *HN* 35.50.175.

²⁷ *Ibid.* The sections 174–7 in book 35 of the *Historia Naturalis* are the major source for the physical description of the different kinds of sulphur. On sulphur see: J. F. Healy, 'Pliny on Mineralogy and Metals', in *Science in the Early Roman Empire: Pliny the Elder, his Sources and Influence*, ed. R. French (Beckenham, 1986), 131–2.

²⁸ Pliny, *HN* 35.57.198. Some doubts must still exist since *glæbum* would certainly also drive off pests, and the lowest grade sulphur, here styled 'wick-grade', being the least expensive, may well have been put to that use.

²⁹ See Tibullus 1.5.11, where he claims that sprinkling sulphur around her bed saved Delia from a serious illness. Ovid, *Fasti* 4.21.739, recommends holding a sheep over sulphur smoke in preparation for the Parilia.

that the highest grade of sulphur would have been preferred. *Glaebum* was properly only a detergent for clothes. Quintilian notes,³⁰ however, that it was strong enough to fade inexpensive dyes.

The highest quality sulphur, and the only one suitable for internal and external medicine, was *vivum*. Celsus records that it was effective in cough syrup (1.390), for general pain relief (1.348), and as a wart remover (2.10). Pliny adds that sulphur-based mixtures were applied to the eyes (*HN* 34.50.167), stopped bleeding (*HN* 34.50.167), and worked as a laxative (*HN* 35.54.79; Celsus 2.8). Then, as now, sulphur was a basic ingredient in preparing lotions to treat skin problems and for personal hygiene, a use known even to Homer.³¹

Its solid state would have made it easier for the ragman to carry with him, and easier to break into larger or smaller pieces, depending on the amount of glass to be had in exchange. Any presumed cost differential between *vivum* and 'wick-grade' sulphur³² would have been minimized by the bulk and inconvenience of the storage of either liquid low-grade sulphur or the sulphured *ramenta*.³³ This is not to say that fire starters (or extenders) did not exist; the evidence from Seneca is too decisive to deny it, or even that hawkers exchanged them sometimes for glass, or sold them outright; that may well be the activity in which the 'drowsy-eyed salesman of sulphured merchandise' is engaged in Martial 12.57.14.³⁴ But because of the *pallens* in 1.41, the hawker there could not have been giving out matches, but only a much more useful commodity, and the glass obtained must have had a comparable value. It has been enough to suggest that not every mention of sulphur, particularly the substantival adjective, implies *ramentum*, and that the readers of Statius³⁵ and Juvenal,³⁶ among many others, ought to exercise caution against old, anachronistic, or facile interpretations.*

Xavier University

GEORGE W. M. HARRISON

³⁰ *Institutio oratoria* 12.76; see also Celsus 2.6.

³¹ *Iliad* 16.228 and *Odyssey* 22.481.

³² *Egula* and *glaebum* would have had severely restricted domestic rôles which would have made them unattractive for trade.

³³ One assumes that the outer coating was brittle and given to cracking away, which would have lessened its appeal.

³⁴ *sulphuratae lippus insitior mercis*.

³⁵ E.g. *Silvae* 1.6.73–4.

³⁶ As in *Saturae* 5.48.

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