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WATER AND BRONZE IN THE HANDS OF EMPEDOCLES' MUSE

This study is divided into two parts. The first part reproduces, in English translation, the beginning of a French article entitled *Les cinq sources dont parle Empédocle* which was published in the *Revue des études grecques* in 2004 (vol. 117, pp. 393–446), and its corrigenda in the *Revue des études grecques* (vol. 118, 2005, pp. 322–325). The second part, *Addenda*, focuses on the interpretation of the five springs. Its main purpose is to provide new elements of interpretation in the wake of the publication of M. Rashed's article, entitled *De qui la clepsydre est–elle le nom? Une interprétation du fragment 100 d'Empédocle* (in: *REG*, 121, 2/2008, pp. 443–468).

I The five springs

It is more than a century since a link is supposed to have been established between an anonymous fragment of verse that Aristotle quotes in the *Poetics* and a line cited and expressly attributed to Empedocles by Theon of Smyrna, the Middle Platonist mathematician and philosopher¹. At this stage, without going into too much detail, I should like to offer a rapid sketch of how the two passages have been treated in the past before going on to deal with the questions which this article seeks to examine: (1) What were the exact words that Theon quoted from Empedocles? (2) What is their precise sense?

J. Vahlen, in 1873, was the first to seek to establish a link between the anonymous quotation found in Aristotle's *Poetics* 1457 b 14, ταμῶν ἀτειοῦ χαλκῶ, and the following passage which occurs in the introduction to Theon of Smyrna's *Arithmetic* (p. 21 of J. J. De Gelder's edition)²:

* My thanks are due to Joëlle Delattre, Susy Marcon, Suzanne Stern–Gillet, Marwan Rashed and Simon Trépanier for their help and advice on numerous points in this article. My gratitude to D. O'Brien relates to every aspect of my work on the five springs mentioned by Empedocles. Throughout the period of years I have devoted to it D. O'Brien has been a constant companion in my labours, raising questions for me to try to answer, and unfailing in his encouragement. – I should also like to express my thanks to Christopher Strachan for his translation from the French, and to Jeremy Filleul.

¹ Aristotle, *Poetics* 1457 b 14. Theon of Smyrna, *Expositio rerum mathematicarum ad legendum Platonem utilium*, ed. E. Hiller, Teubner, Leipzig 1878, p. 15.10–11.

² J. Vahlen, *Eine Miszelle zu Aristoteles' Poetik* in: *Zeitschrift für die österreichischen Gymnasien* 24, 1873, p. 659, J. J. de Gelder, *Theonis Smyrnaei arithmetica: Bullialdi versione, lectionis diversitate et annotatione auctam*, S. and J. Luchtman, Leyden 1827, p. 21. Gelder's edition of Theon of Smyrna reproduces that of I. Boullia published in 1644, with additional readings from a manuscript preserved in Leyden.

ὁ μὲν γὰρ Ἐμπεδοκλῆς, κρηνάων ἀπὸ πέντ' ἀνιμῶντα,
 φησὶν, ἀτειροῖ χαλκῶ δεῖν ἀπορῴπτεσθαι.
 For Empedocles says, 'One must purify oneself by drawing from
 five springs with indestructible bronze.'¹

The association relies, on the one hand, on the occurrence of the words ἀτειροῖ χαλκῶ in both Aristotle and Theon, and, on the other, on the possibility that the verb *cut* (τάμνω) and the verb *draw*, in the sense of *draw off* [a liquid] (ἀνιμῶ) are equivalent in sense. It is just such an equivalence that Aristotle, at *Poetics* 1457 b 13–16, demonstrates in his explanation of a metaphor in which the verb *cut* (in ταμῶν ἀτειροῖ χαλκῶ) and the verb *draw (off)* (in χαλκῶ ἀπὸ ψυχῆν ἀρούσας) replace each other. But the verb Aristotle mentions is not a part of the verb ἀνιμῶ. It is a part of ἀρούω. However, considering that the two verbs ἀνιμῶ and ἀρούω are synonyms, Vahlen felt entitled to substitute ἀνιμῶν for ἀρούσας and so to treat ἀνιμῶν as equivalent to ταμῶν. Taking full advantage of this double manoeuvre, Vahlen attributed to Empedocles both the quotations (χαλκῶ ἀπὸ ψυχῆν ἀρούσας and ταμῶν ἀτειροῖ χαλκῶ) that Aristotle had used without naming their author to illustrate the metaphor.

The most recent complete edition of the only work of Theon of Smyrna to have come down to us, *Expositio rerum mathematicarum ad legendum Platonem utilium* (*Expositio* for short), was published by E. Hiller as long ago as 1878². It relies on a manuscript preserved in the Library of St. Mark's in Venice which had escaped Gelder's recension. Hiller printed the passage which appears above without major alteration. He refers in a note to Aristotle's *Poetics* and provides an apparatus criticus that mentions several erasures and in particular that ἀτειροῖ has been corrected from ἀκηροῖ.

In 1880, H. Diels, taking his lead from the *Poetics* and in the light of a fresh inspection of the Venice manuscript, put forward the view that, in it, the reading ἀνιμῶντα masked a partially scraped out reading which was none other than ταμόντα³. With this step forward, which took matters further than Hiller had, the link with the *Poetics* became yet more concrete than Vahlen had imagined. In his edition of the fragments of Empedocles Diels went on to designate χαλκῶ ἀπὸ ψυχῆν ἀρούσας as fr. 138 and κρηνάων ἀπο πέντε ταμόντ' < ἐν > ἀτειροῖ χαλκῶι as fr. 143⁴.

¹ J. J. de Gelder, *Theonis Smyrnaei arithmetica ...*, p. 21 writes, *Oportet sordibus mundari haurientem puro aere ex quinque fontibus*. He does not say *indestructible bronze*, but *pure bronze*, thus simply copying Boulliaud's rendering. This is not the translation I adopt.

² E. Hiller, *Theonis Smyrnaei, Philosophi Platonici, Expositio rerum mathematicarum ad legendum Platonem utilium*, (1st ed. 1878), repr. Stuttgart – Leipzig, Teubner 1995.

³ H. Diels, *Studia Empedoclea* in: *Hermes* 15, 1880, pp. 173–175. This article is accessible on the internet, thanks to Gallica, the digital service of the Bibliothèque Nationale de France (<http://gallica.bnf.fr/ark:/12148/bpt6k54964p.image.r=Hermes+Zeitschrift.f181.langFR>).

⁴ Wherever possible I follow the numeration in Diels–Kranz in referring to the various fragments of Empedocles. I use the abbreviation *fr.* for *fragment*, being careful to distinguish the fragments on the one hand from the testimonia on the other (Part A in the Diels–Kranz collection), and also from the material assembled in Part B which includes but is not restricted to the fragments themselves. Thus according to the convention I have adopted, B 138 would be used to designate not just fr. 138 itself but all that Diels prints under the number 138,

The link between *Poetics* and *Expositio* might have been broken in 1911 when D. S. Margoliouth brought out a new edition of the text of Aristotle's *Poetics*¹. This no longer kept Vahlen's reading, ταμῶν ἀτειροί χαλκῶ, but adopted the text Margoliouth found in a recently discovered manuscript of the *Poetics* ταμῶν ταναηκέϊ χαλκῶ. This is the reading that is still accepted today², except that ταμῶν has been changed to τεμῶν and the accent on ταναηκέϊ moved back (ταναήκεϊ). With the change in the adjective from ἀτειροί to ταναηκέϊ it appeared that a gap was opening up between the *Poetics* and the *Expositio*. But the link was not broken. In 1936, with Margoliouth's edition of the *Poetics* in mind, P. Maas examined a photograph of the manuscript upon which Hiller had based his edition of Theon³. He concluded that the word that had originally stood before χαλκῶ in the manuscript was not ἀτειροί but ταναήκεϊ. The link with the *Poetics* remained.

The various editions of Empedocles that have appeared in the last thirty years for the most part follow Maas and print the line corresponding to Diels fr. 143 as follows:

κορηνάων ἄπο πέντε ταμῶν ταναήκεϊ χαλκῶ.

Having cut from five streams with a long pointed bronze (implement).

When it comes to interpretation, there are, basically, two ways of construing the line: Diels' way and that of N. Van der Ben. For Diels, the bronze (ἀτειροί χαλκῶι) is a container used to collect water at five springs as part of a ritual of purification⁴. For Van der Ben, the bronze (ταναήκεϊ χαλκῶ) is something to cut with, which is used in a blood-sacrifice; the five springs represent five sacrificed animals⁵. The change from ἀτειροί to ταναήκεϊ can make a great difference to the direction the interpretation will take.

including in particular a part of fr. 143. There is an increasing tendency to adopt differing practices, with some authors using B 138 to mean the fragment and nothing else, while others like B. Inwood, *The poem of Empedocles*, University of Toronto Press, Toronto 1992, p. 4, go so far as to treat the testimonia as if they were fragments.

¹ D. S. Margoliouth, *The Poetics of Aristotle*, Hodder and Stoughton, London – New–York – Toronto 1911.

² For Aristotle's *Poetics* the text of reference is today that of R. Kassel, *Aristotelis de arte poetica liber*, Oxford 1965. The value of this edition was soon recognised. In 1968, D. W. Lucas, *Aristotle, Poetics: introduction, commentary, and appendixes*, Oxford 1968, p. V, acknowledged his debt to Kassel: *It has been my good fortune to be able to use Professor R. Kassel's Oxford Text*. S. Halliwell, who revised Aristotle's *Poetics* for the Loeb Classical Library in 1995 relied on Kassel's edition. In all three editions the fragment quoted in 1457 b 14 takes the same form: τεμῶν ταναήκεϊ χαλκῶ. The principal manuscripts all share the reading τεμῶν; ταμῶν is I. Bekker's correction, adopted by both Vahlen and Margoliouth.

³ P. Maas in *Byzantinische Zeitschrift* 36, 1936, (Abteilung), pp. 456–457.

⁴ Diels does not explicitly assert that the indestructible bronze is a container. However, it must surely be the case that, in the context of a rite, an object that can cut off a stream of water is in all likelihood a container. See H. Diels *Symbola Empedoclea* in: *Mélanges Henri Weil*, A. Fontemoing, Paris 1898, p. 128, H. Diels, *Sibyllinische Blätter*, G. Reimer, Berlin 1890, pp. 71–73. Diels' readers have no doubt on the point. K. Freeman, *Ancilla to the pre-socratic philosophers*, Harvard University Press, Cambridge (MA) 1948, p. 68, for example, translates and supplements fr. 143 thus: (*Wash the hands*) *cutting off (water) from five springs into (a vessel of) enduring bronze*. W. Kranz, *Vorsokratisches III* in: *Hermes* 70, 1935, p. 112, speaks clearly of purification with water: *Sich reinigen mit Wasser, das nach bestimmtem Ritus aus fünf verschiedenen Quellen geschöpft ist* (143).

⁵ N. van der Ben, *The poem of Empedocles' Peri physios: Towards a new edition of all the fragments*, Grüner, Amsterdam 1975, pp. 110–111, pp. 202–208.

The divergence in readings should not be allowed to obscure an essential point. There are two things all commentators on fr. 143 since Diels have in common: their recourse to Aristotle's *Poetics* to provide the key to their understanding of its content, and their neglect of the context in which Theon of Smyrna embeds his quotation. Opening the file on fr. 143 entails, in particular, examining the soundness of their common approach. What I should like to do here is to try to discover the precise words that Theon quoted from Empedocles, and to understand the meaning to be attached to them.

The Venice manuscript, *Marc. gr. Z 307*

Theon of Smyrna's work consists of three parts: arithmetic, music and astronomy. The first two parts were published for the first time in 1644 by I. Boulliau. For his edition, Boulliau consulted four manuscripts of Theon that were kept in Paris. Of these, he chose to follow one that was written in the 16th century and belonged to J.–A. de Thou (*Colbert. 3516 = Parisinus gr. 2014*). Variant readings from the other three manuscripts he placed in the margins. In de Thou's manuscript we find the reading ἀτηροῖ χαλκῶ. In 1827, Gelder published the first part of Theon's work, which dealt with arithmetic. He reproduced Boulliau's edition with some minor corrections, including ἀτειροῖ for ἀτηροῖ, and added readings from a manuscript of Theon kept in Leyden. The second part of the *Expositio*, dealing with astronomy, was published for the first time in 1849 by Th. H. Martin.

Hiller's edition of Theon (1878) is of particular interest for this study, because he used a vellum manuscript whose existence was unknown to Boulliau, and which Gelder had not himself checked. This manuscript, *Marc. gr. Z 307* (= *collocazione 1027*), dates from the 12th century and is the oldest of all known manuscripts of Theon¹. Hiller considered *Marc. gr. Z 307* to be the archetype from which the other known manuscripts were derived. There is no reason today to doubt his conclusion.

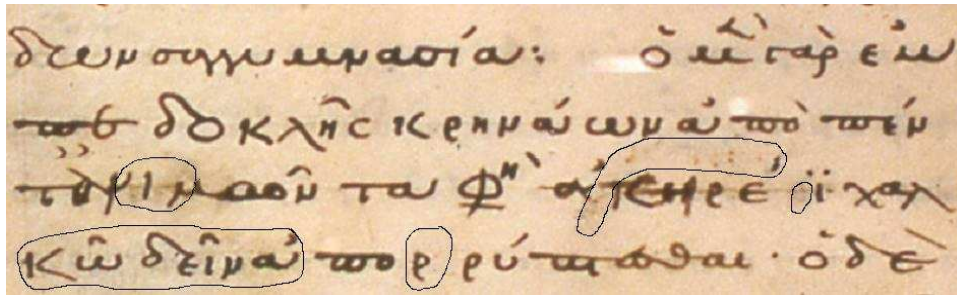
After collating photocopies of the page containing the Empedocles quotation from each of 21 manuscripts of Theon, I have been able to determine that all of them could have come directly or indirectly from the archetype. Two noteworthy points emerge: (1) Allowing for some variation in punctuation, accents and the substitution of one letter for another through error or assimilation, what can be read in each of these 21 manuscripts is what can be read in *Marc. gr. Z 307*. (2) In *Marc. gr. Z 307*, folio 13v, line 10, it is possible to read ἀκηροῖ or to detect, from the letter traces in the same place,

¹ Because in his recension of the Venice manuscripts in 1827 Gelder did not look beyond a work that appeared in 1739, B. de Montfaucon's *Bibliotheca bibliothecarum manuscriptorum nova* (vol. I), he was bound to miss the vellum manuscript that was destined to form the new basis for an edition of Theon. This manuscript had been effectively omitted by Montfaucon and appeared for the first time in A. M. Zanetti and A. Bongiovanni, *Graeca D. Marci bibliotheca codicum manu scriptorum per titulos digesta*, a work published in 1740 – a year after Montfaucon's catalogue. It is the Z of Zanetti that is prefixed to the serial number identifying *Marc. gr. Z 307*. This manuscript, which was written in Norman Sicily, forms part of the Bessarion collection. On this point, see G. Cavallo, *La trasmissione scritta della cultura greca antica in Calabria e in Sicilia tra i secoli X–XV* in: *Scrittura e Civiltà* 4, 1980, p. 202. For the identification and description of the manuscript, see E. Mioni, *Bibliothecae Divi Marci Venetiarum codices graeci manuscripti: Thesaurus antiquus*, vol. II, Rome 1985 (Indici e cataloghi, nuova serie, VI), pp. 14–15.

ἀκηρέϊ. A copyist using *Marc. gr. Z 307* as his exemplar is, then, faced with a choice of readings. The 21 manuscripts fall into two groups, one in which ἀκηρέϊ is clearly legible, and one in which the reading is, equally clearly, ἀτηρέϊ. There is no sign in any of them of the ambiguity present in the archetype: a choice has been made.

Up until now only two people have examined the piece of Empedocles with which we are concerned as it appears in *Marc. gr. Z 307* (= folio 13v lines 9–11) and made their findings known in subsequent publications: Hiller in 1878 and Schrader, shortly after Hiller, some time before 1880¹.

What did they see?



Reproduction of lines 8–11 which relate to Empedocles in *Marc. gr. Z 307* fol. 13v. The erased areas have been outlined in black.

Here is Hiller's text (15.9–11) and the accompanying apparatus criticus:

ὁ μὲν 9

γὰρ Ἐμπεδοκλῆς κρηνάων ἀπὸ πέντ' ἀνημῶντα φησὶν ἀτει- 10
 ρεῖ χαλκῶ δεῖν ἀπορρύπτεσθαι. 11

10 Ἐμπεδοκλῆς : vs. 422 Karsten, 442 Stein, 452 Mullach. cf. Aristot. Poet. p. 1457 b ἀνημῶντα: αν et ω ex corr. ι in ras. A ἀτειρέϊ corr. ex ἀκηρέϊ, inter ρέ et ι una lit. er. A 11 χαλκῶ δεῖν ἀπορρύπτεσθαι: κῶ δεῖν et pr. ρ in ras. A.

Hiller uses A to denote *Marc. gr. Z 307*.

We should notice that the word that stands out most obviously between the compendium representing φησὶν and the beginning of χαλκῶ is not ἀτειρέϊ but ἀκηρέϊ or to be more precise ἀκηρέϊ. The word is unknown. The κ and the η that make ἀκηρέϊ are much easier to distinguish than either the τ or the ι of εἰ (which partially coincides with the second vertical stroke of the

¹ Schrader's observations are enshrined in Diels' article, *Studia Empedoclea*. In 1880 Schrader published a work entitled *Porphyrii Quaestionum Homericarum ad Iliadem pertinentium reliquas*. The edition rests in particular on two manuscripts in the St. Mark's Library: *Marc. gr. 454* and *Marc. gr. 453*. It is quite possible to imagine that in the course of a trip to Venice for the purpose of examining these two manuscripts, Schrader took the opportunity to consult the manuscript of Theon. He then described in a letter to Diels the reading he found at 15.9–11 (Diels takes account of this letter in *Studia Empedoclea*.)

η), which go to form ἀτειοῖ, a readily comprehensible epithet that can be applied to bronze. In the restoration of ἀτειοῖ, the horizontal tongue of the ε in τει looks, on the manuscript, to be no more than the remains of an erasure. The reading ἀτειοῖ is thus uncertain. Instead of ἀτειοῖ, we could read ἀτηοῖ. But the η seems to be in the same hand as the κ. So the reading ἀτηοῖ must also be regarded as uncertain. Accordingly, the later copyists of the twelfth-century *Marc. gr. Z 307* made their choice, and sometimes read ἀτηοῖ, sometimes ἀκηοῖ¹.

At the request of Diels, Schrader examined the Empedocles quotation in the Venice manuscript. Here are Schrader's main observations, which have the effect of supplementing or, as the case may be, contradicting those of Hiller:

1. Under the initial α of ἀνιμῶντα an ε can be made out covered up by the α; this allows πέντε to be read without the elision of the final ε.
2. The μ of ἀνιμῶντα was originally followed by an ο.
3. The erasure in which the ι of ἀνιμῶντα is written could originally have accommodated a broader letter, or perhaps two small letters.
4. Contrary to Hiller's assertion, ἀτειοῖ is not a manuscript correction from ἀκηοῖ; the correction is the other way round, from ἀτειοῖ to ἀκηοῖ.
5. There is an erasure in front of the κ of ἀκηοῖ.
6. In the erasure between the ε and the ι of ἀκηοῖ there seems to have been an ο or a σ.
7. There used to be an interlinear gloss, subsequently erased, above the word ἀκηοῖ.
8. The α of ἀπορρῦπτεσθαι has been written in an erasure.
9. The first ρ of ἀπορρῦπτεσθαι is written in an erasure in which a letter larger than the ρ must originally have stood.

Neither Hiller nor Schrader states that ἀνιμῶντα masks an earlier reading, *sc.* ταμόντα. But this was what, without seeing the manuscript, Diels would deduce². What is remarkable about this, as we are about to see in detail, is the fact that from a piece of false information provided by Schrader Diels was able to arrive at a result that was right (ταμόντα). How did this come about?

Starting from Schrader's assertion that the μ of ἀνιμῶντα was originally followed by an ο, Diels declared that the ο belonged to the word ταμόντα. It

¹ Out of 21 manuscripts held in 6 different libraries, I have found 13 which, allowing for some variation in the way the word is written, opt for ἀκηοῖ: *Par. gr.* 2013 (16th c.) fol. 9r, *Laurent. pluteus* 59.1 fol. 13r: ἀκηοῖ – *Par. gr.* 1806 (15th c.) fol. 6v, *Bodl. ms.* Cherry 37 fol. 63v: ἀκηοῖ – *Par. gr.* 1817 (16th c.) fol. 4v: ἀκηοῖ – *Par. gr.* 1820 (17th c.) fol. 7r, 2428 (16th c.) fol. 77r, *Bodl. ms.* Savile 6 fol. 146v: ἀκειοῖ – *Scorial.* X. I. 4 gr. 346 (16th c.) fol. 222r: ἀκειοῖ – *Par. gr.* 2450 (14th c.) fol. 181v, *Laurent. pluteus* 85.9 fol. 14r, *Scorial.* Σ. III. I gr. 100 (16th c.) fol. 35r, *Scorial.* Ω. IV. 4 gr. 555 (16th c.) fol. 130v: ἀκειοῖ – and 8 which opt for ἀτηοῖ: *Par. gr.* 2014 (16th c.) fol. 9v, *Par. gr.* 1819 (16th c.) fol. 12r, Cambridge King's College *ms* 23, fol. 11r, *Leid.* Scal. 50 fol. 4v: ἀτηοῖ – *Par. suppl. gr.* 336 (15th c.) fol. 133r, 450 (15th c.) fol. 81r, *Laurent. pluteus* 28.12 fol. 4v, *Bodl. ms.* Laud *gr.* 44 fol. 17: ἀτειοῖ. – The same style of writing is to be seen in mss. 2014 (in Paris), 1819 (in Paris) and 23 (in Cambridge); ms. 2014 is attributed to the copyist Constantin Palaeocappa, 1819 to Jacques Diassorinos. Ms. 23 seems to be by the same hand as 1819, which would mean it was written by Diassorinos. — *Par. gr.* 1818, which H. Omont's catalogues record as being a manuscript of Theon of Smyrna kept in the Bibliothèque nationale, does not in reality contain any work (or a part of any work) by Theon, but instead contains a passage from Proclus' *Platonic Theology*.

² H. Diels, *Studia Empedoclea*, p. 174.

went without saying, as far as Diels was concerned, that the preceding μ was also original since it was not written in an erasure and neither Hiller nor Schrader had said anything of its arising from a letter that had subsequently been altered. To sum up, Diels believed that the sequence of two letters $\mu\omicron$ observable in the manuscript – the μ of $\acute{\alpha}\nu\iota\mu\omega\acute{\nu}\tau\alpha$ and the \omicron detectable in the first part of the ω – were two letters belonging to $\tau\alpha\mu\acute{\omicron}\nu\tau\alpha$ which must then be added to the three final letters $\nu\tau\alpha$ shared by $\acute{\alpha}\nu\iota\mu\omega\acute{\nu}\tau\alpha$ and $\tau\alpha\mu\acute{\omicron}\nu\tau\alpha$. To be sure, $\tau\alpha\mu\acute{\omicron}\nu\tau\alpha$ lacked its initial $\tau\alpha$; but the τ should come as no surprise, given that the restoration of the final ε of $\pi\acute{\epsilon}\nu\tau\epsilon$ guaranteed that the original verb began with a consonant – which could easily be a τ . Diels could in good faith conclude that $\tau\alpha\mu\acute{\omicron}\nu\tau\alpha$ was the word that should be read instead of $\acute{\alpha}\nu\iota\mu\omega\acute{\nu}\tau\alpha$. I have examined the manuscript and reconstructed the chain of clues that lead back to $\tau\alpha\mu\acute{\omicron}\nu\tau\alpha$ rather differently:

1. The μ of $\acute{\alpha}\nu\iota\mu\omega\acute{\nu}\tau\alpha$ is not an original μ , contrary to the inference to be drawn from the silence of Hiller and Schrader. In writing μ the copyist does not employ an initial down stroke (a good example of an original μ is to be found in the μ of $\mu\acute{\epsilon}\nu$ at the beginning of the manuscript extract reproduced above). Hiller could have pointed this out, because, unlike Schrader, he had studied the manuscript in its entirety and learned to distinguish the hand of the copyist from that of the corrector¹.
2. The greater part of the μ of $\acute{\alpha}\nu\iota\mu\omega\acute{\nu}\tau\alpha$, viz. the initial down stroke and the upward curve, is situated in an erasure. This area is an extension of one to which Hiller drew attention ('ι in ras.'). The erasure is thus larger than might be expected from the impression given by Hiller (and in effect tacitly confirmed by Schrader who made no attempt to modify it). The second part of the μ – the descending curve that is joined to the ω – is on an area where there is no erasure. Under ultra-violet light, another upward curve belonging to an original letter is discernible underneath the upward curve of the μ . It is then clear that the μ of $\acute{\alpha}\nu\iota\mu\omega\acute{\nu}\tau\alpha$ is a letter written by a corrector straddling an erased and non-erased area, in one continuous action covering a letter (or part of a letter), written by the original copyist. The original letter contained an upward curve, but was not necessarily a μ .
3. Contrary to Schrader's assertion, the \omicron , after the μ , is not original. It was constructed by a corrector who added a dome-shaped arc to a letter that had formerly been a μ (cf. the μ in $\mu\acute{\epsilon}\nu$ referred to above). The corrector's aim was to construct the sort of omega that consists of a pair of omicrons that are linked together, or placed side by side². He used an \omicron that was already there, the second \omicron in the order of writing after the μ , which would form the second part of his ω . He then had to manufacture the first \omicron by adding a dome to the letter already in place (the copyist's μ). He had no need to link the two

¹ Hiller observed that $\delta\mu\mu\alpha$ (p. 3.12 = folio 3r.16) is written in an erasure. The form used for the letter μ , with an initial down stroke (as in $\acute{\alpha}\nu\iota\mu\omega\acute{\nu}\tau\alpha$), shows that the word is clearly the work of a corrector. Hiller does not, however, signal all the places in which corrections occur. He provides a reduced apparatus criticus.

² Examples of ω written in this way are: $\acute{\alpha}\phi\acute{\iota}\kappa\omega\nu\tau\alpha\iota$ (p. 5.1 = folio 4v.6), $\acute{\epsilon}\mu\pi\acute{\omicron}\rho\omega\nu$ (p. 5.2 = folio 4v.7), $\tau\acute{\omega}\nu$ (p. 8.6 = folio 7r.3).

omicrons, since the letter he had altered was already linked to the o which followed.

4. The circumflex accent on ἀνιμῶντα is not written over the ω, but almost above the ν; and not only that, the accent is formed by two pen–strokes, the first being an acute accent, and the second being added by a corrector to turn the acute into a circumflex. The position of the circumflex accent and the absence of any sign of erasure above the ω constitute strong confirmation that the o immediately after the μ was not the formerly accented o of ταμόντα.

5. The initial τ of ταμόντα has been almost entirely scraped out; by shining a light on it and using a magnifying glass one can make out only the start of the horizontal bar at the junction of the α and the ν of ἀνιμῶντα, on the ruled guideline (a straight line which passes through the horizontal bar of the τ of πέντε at one end and the top of the λ of χαλ[κῶ] at the other). The vertical bar of the τ was positioned between the ν and the ι of ἀνιμῶντα and is quite easy to detect under ultra–violet light.

6. The original form, before erasure and overwriting, of the beginning of the line today occupied by the reading τ' ἀνιμῶντα may be hypothetically reconstructed as follows:

τ ε τ α μ ὄ ν τ α

The τ and ε of πέντε form a ligature of which the ε would afterwards be covered by the α at the beginning of ἀνιμῶντα. After scraping out a great part of the τα of ταμόντα and writing ἀνι, the corrector would go on to insert a μ, which would cover up the final upward curve of the first α in ταμόντα. Lastly he would make a clumsy attempt to transform the μό of ταμόντα into ῶ.

All in all, then, while the clues provided by this fresh inspection in some respects differ from as well as complement those available to Diels from the work of Hiller and Schrader, they confirm that ἀνιμῶντα does indeed hide ταμόντα, the word originally written by the copyist. Vahlen's instincts had been correct. Does it then follow that we must now take it for granted that he was right to associate Aristotle's *Poetics* and Theon's *Expositio* and that Empedocles is the author of the two fragments quoted in the *Poetics*? That is much less certain.

In 1936, Maas contributed a short bibliographical account, which appeared in the *Byzantinische Zeitschrift*, of A. Gudeman's work on Aristotle's *Poetics*¹. Maas's interest lay particularly in the role of a manuscript Margoliouth had made use of in 1911, the *Riccardianus* 46. He ends his account with a short study on the Empedocles quotation to be found in Theon of Smyrna and associated with *Poetics* 1457 b 14. Maas states that he has examined a photograph of the Theon manuscript kept in Venice (*Marc. gr. Z* 307). He notes that the traditional reading, ἀτειοῖ (ἀτειοῖ in Hiller's

¹ P. Maas in *Byzantinische Zeitschrift* 36, 1936, (Abteilung), pp. 456–457.

edition), is a word that has been imported by a corrector. He confirms that the part preceding the final $\ddot{\iota}$, i.e. the space occupied by $\acute{\alpha}\tau\epsilon\iota\omega\acute{\epsilon}$ –, had been subject to erasure. In Maas's view, the space in question had contained an eight-letter word, which must be $\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon\ddot{\iota}$ ¹. It was no accident that Maas introduced $\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon\ddot{\iota}$. It is adapted from the reading of *Riccardianus* 46, at 1457 b 14². This reading had in fact been kept by Gudeman in preference to the traditionally accepted $\acute{\alpha}\tau\epsilon\iota\omega\acute{\epsilon}\iota$ read by the earlier editors I. Bekker, J. Vahlen, and I. Bywater. It has this to be said for it: it both suits the metre of the hexameter and is paralleled in Homer and Hesiod.

But Maas had shown want of judgement in two respects: (1) He had based his assessment of what was written on a surface displaying erasures on evidence that was both unreliable and difficult to verify: a photograph and a description of the passage that he owed to a third party³. (2) He had failed to take any account of the testimonies of Hiller and Schrader. Now, some of the data provided by Hiller and Schrader are alone enough to undermine the suggestion $\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon\ddot{\iota}$.

Maas states that the whole area in front of the $\ddot{\iota}$ has been subject to erasure⁴. Such an assertion is a prerequisite for the introduction of $\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon\ddot{\iota}$, a word whose letters do not bear much resemblance to those of $\acute{\alpha}\tau\epsilon\iota\omega\acute{\epsilon}\iota$. But the assertion is false. Hiller and Schrader in no way state that the whole area in front of the $\ddot{\iota}$ has been subject to erasure. Schrader mentions an erasure affecting the beginning of the word, in front of the κ . Hiller – and Schrader confirms it – mentions an erasure affecting the end of the word, between the $\acute{\epsilon}$ and the $\ddot{\iota}$. It is possible to deduce from that that the whole area from and including the κ (or τ) up to and including the $\acute{\epsilon}$ has not been subject to erasure. The letters $\omega\epsilon$ both seem to be original, given that neither Hiller nor Schrader says anything about them. How then could Maas accommodate $\omega\epsilon$ in $\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon\ddot{\iota}$? He cannot. A further objection is that the position of the ϵ of $\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon\ddot{\iota}$ would not correspond to that occupied by the original ϵ in the

¹ P. Maas in *Byzantinische Zeitschrift* 36, 1936, (Abteilung), p. 456. In the supplement to the 1951 edition of *Die Fragmente der Vorsokratiker* (F. V. ⁶ p. 501, 1.28–29), W. Kranz corrected the last part of fr. 143 by bringing in Maas's reading.

² The exact reading of *Riccardianus* 46 is $\tau\alpha\nu\acute{\alpha}\kappa\epsilon\iota$. In his account, Maas writes $\tau\alpha\nu\acute{\alpha}\kappa\epsilon\iota$ in *R*. He not only misplaces the accent but refers to *Riccardianus* 46 misleadingly as *R*, when editors of the *Poetics* had taken care to designate this manuscript by *B*, or *R*¹, or *R*², or *R*³, to distinguish it from the two other manuscripts of the *Poetics* held in the Riccardian Library. Today it is referred to only as *B* – which was what D. S. Margoliouth, *The Poetics of Aristotle*, p. XV called it. – These were not Maas's only inaccuracies. He cites the three lines of Empedocles quoted by Theon (15, 9–11 Hiller) as 15, 7 Hiller. – Faulty accentuation is not uncommon. In *Ric.* 46 the correct reading is $\tau\epsilon\mu\acute{\omega}\nu\ \tau\alpha\nu\acute{\alpha}\kappa\epsilon\iota$. This is accurately recorded in Margoliouth's apparatus criticus: but the apparatus in Kassel's edition has $\tau\epsilon\mu\acute{\omega}\nu$. Lucas and Halliwell likewise print $\tau\epsilon\mu\acute{\omega}\nu$.

³ This was A. Zanolli, whom he mentions by name.

⁴ P. Maas in *Byzantinische Zeitschrift* 36, 1936, (Abteilung), p. 456: *Hinzu tritt* Theon Smyrn., Arithm. Plat. S. 15, 7 Hiller $\acute{\omicron}\ \mu\acute{\epsilon}\nu\ \gamma\acute{\alpha}\rho\ \acute{\epsilon}\mu\pi\epsilon\delta\omicron\kappa\lambda\eta\varsigma\ \kappa\eta\eta\nu\acute{\alpha}\omega\nu\ \acute{\alpha}\pi\acute{\omicron}\ \pi\acute{\epsilon}\nu\tau[\epsilon\ \tau\alpha]\mu\acute{\omicron}\nu\tau\alpha\ \phi\eta\sigma\acute{\iota}\nu\ [\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon\ddot{\iota}]\ \chi\alpha\lambda\kappa\acute{\omega}\ \delta\epsilon\acute{\iota}\nu\ \acute{\alpha}\pi\omicron\sigma\omicron\rho\acute{\upsilon}\pi\tau\epsilon\sigma\theta\alpha\iota$. *An den in [] stehenden Stellen ist in dem codex unicus des Theon, dem Marcian. 307 s. 11/12 (eine Photographie und Beschreibung der Stelle danke ich A. Zanolli, Treviso) die Lesung erster Hand v\o\llig ausradiert. Eine zweite Hand machte daraus πέντ' ἀνιμῶντα und ἀτηρῆϊ dies wieder in ἀτειρῆϊ geändert; das durch ἀτηρῆϊ verdrängte Wort war um etwa zwei Buchstaben länger, wird also ταναήκεϊ gewesen sein.* Besides asserting that $\tau\alpha\nu\acute{\alpha}\eta\kappa\epsilon$ – had been erased, Maas believed, like Diels that the μ and the $\acute{\omicron}$ of $\tau\alpha\mu\acute{\omicron}\nu\tau\alpha$ were still visible in the place where the μ and the first part of the ω of $\acute{\alpha}\nu\iota\mu\acute{\omega}\nu\tau\alpha$ are situated.

manuscript, since one letter has been erased between that ε and the ï. Hiller and Schrader directly contradict Maas. Codicological objections could long since have proved fatal to Maas's account. But the account was peculiarly accommodating. It removed the possibility of questioning the link between the *Poetics* and the *Expositio*. And, to all appearances, it saved the edifice constructed by Vahlen and Diels¹.

There was patently a need to verify the exact positions on the manuscript of the erased areas that come after φησίν. This appeared to me to be all the more important because (1) Hiller and Schrader do not agree on the extent of the erasures and (2) Maas's line of argument depends on an erasure that covers the whole area.

This is what can be seen on the manuscript by shining a light–pencil horizontally over the surface:

1. As Schrader says, there is indeed an area of erasure before the κ. It extends vertically downwards below the ruled guideline, presupposing a letter incorporating a down stroke (γ? or a copyist's compendium for ου, which resembles a γ). The erasure does not spread beneath the initial α. It is thus between the α and the κ. It does not include the smooth breathing on the ᾱ. The confirmation of this erasure has some awkward implications. On the one hand, it shows that Hiller is not reliable, for the rubbed area is clear, yet Hiller does not mention it². On the other, it casts doubt on the analyses that rely on the fact that ἀτειοῖ can safely be accepted as the word first written by the copyist and that it goes back to Theon. There is also another potential problem: the initial α does not conform to the copyist's usual style. It is not then certain that it is in the copyist's hand.
2. The area extending from and including the κ until after the ρε shows no abrasion of any kind. This datum puts paid to the fantasy that the erasure covers the whole area in front of the ï (ταναήκεῖ is impossible).
3. The space above the κ, and extending to the right until after the accent on the ἑ (ρῆ) has been subject to erasure. Schrader was right in supposing that it had contained an interlinear gloss. In fact traces of some of the letters are still to be observed (five or six letters with perhaps a κ at the start). The accent on the ἑ is wholly situated in this erased area.
4. There is an erasure between the ἑ and the ï. It is highly unlikely that this, situated as it is, quite close to the ï, is wide enough to have been able to hold a

¹ Kassel keeps ταναήκεῖ in his edition of the *Poetics* (1457 b 14). In his *Index locorum*, he provides these details on 1457 b 13–14: *Emped. fr. 138 et 143 Diels*. On the face of it this is useful information. But all it does is to sow confusion. A major feature of Diels' interpretation is to regard the *bronze* that cuts and that draws off as a container for lustral water. It defies belief that Diels could possibly have maintained that a *long pointed bronze* could be a container. In 1912 (*F. V.*³) or again in 1922 (*F. V.*⁴), Diels could have taken account of the reading published by Margoliouth (ταναήκεῖ). But he did nothing of the kind, preferring to keep the reading ἀτειοῖ. Coupling the name of Diels with the attribution to Empedocles of the two fragments in 1457 b 13–14 in a new edition of the *Poetics* is one way of preserving an appearance of continuity.

² In the case of other pages of the manuscript, Hiller draws attention to certain areas of rubbing while passing over others in silence. He is quite capable of miscopying a word from the manuscript: for example he reports the manuscript προστάττωμεν (= folio 3r line 11) in his apparatus (p. 3 line 9) as προστάττωιμι. He omits the diaeresis over the ï in the adjective we are presently discussing (*inter ρῆ et ι una lit. er. A*), though the ï stands out clearly in the manuscript and the copyist is not in the habit of writing ï for ι, without diaeresis (for example the ι in ἀποροῦπτεσθαί).

σ as Schrader supposed. An ε or an ο is more probable. The following ï is in an area without abrasion.

5. Hiller states that there is an erasure under κῶ δεῖν. But Schrader is right in saying that this erasure extends further to include the ᾶ of ἀποκρύπτεσθαι.

6. The first ρ of ἀποκρύπτεσθαι is written in an erasure. Diels thought that the erased letter under the ρ visible today could have been a κ (ἀποκρύπτεσθαι)¹. Two tiny traces of ink at the edge of the erasure may well be the remains of a κ. The traces would mark the upper and lower extremities of the arc completing a κ of the form written by the copyist (as illustrated for example by the κ in Ἐμπεδοκλῆς in the manuscript reproduction).

7. The η of ἀκηεῖ, which is quite obviously a correction, conceals an ε under the first leg and a ν under the second. These two letters are small, in keeping with the writing style of the first hand.

My examination of the manuscript has made me particularly cautious in regard to the restoration of the text that preceded χαλκῶ in the hand of the first copyist. The easiest reading would be ἀτηρεῖ – but it is uncertain, and covered by ἀκηεῖ, a hapax. In that case, even if ἀτηρεῖ is a possible reading, there is no reason to regard it as mandatory; a well-informed reader might have corrected it to restore the language of Empedocles, which in any case abounds with hapax legomena. That is not impossible: but what, then, would ἀκηεῖ be supposed to mean? The word seems to belong to the same family as ἀκηράσιος or ἀκηρατος, which convey the sense *pure*. Theon is talking about purification; given that context it can, then, be conceded that *pure* would be a natural adjective to apply to the bronze. There is however an objection to be faced: the correction ἀκηεῖ would have to be read along with ταμόντα, the *lectio difficilior*, rather than ἀνιμῶντα, the *lectio faciliior*, but not an Empedoclean word. Besides, since ἀκηεῖ is a late correction (in chronological order: the original text, largely erased, then the uncertain ἀτηρεῖ, then ἀκηεῖ), it was in all probability not made at a time when ταμόντα was visible. The correction to ἀκηεῖ in a manuscript displaying ἀνιμῶντα strongly suggests that ἀκηεῖ has no more authority than ἀνιμῶντα. That objection carries weight.

Several words, including perhaps a verb, could have preceded χαλκῶ (or χαλκοῖς if δεῖν was added later). My own conviction is that neither an adjective describing bronze (ταναήκει, ἀτειρεῖ, or ἀκηεῖ) nor a substantive (ἀρυτήρεσι with the adjective χαλκοῖς?) can be kept. Nothing clear emerges. Even if the word χαλκῶ is not an addition belonging to Theon's commentary and does come from Empedocles – as is highly probable – it cannot, it seems to me, be linked in the same line to κρηνάων ἀπὸ πέντε ταμόντα². It is, however, likely that *having cut* is to be construed with

¹ H. Diels, *Studia Empedoclea*, p. 174. According to Diels, the words written by the first hand must have been ἀτειρεῖσι χαλκοῖς δεῖν ἀποκρύπτεσθαι which then, after the intervention of the second hand, became ἀκηεῖ χαλκῶ δεῖν ἀποκρύπτεσθαι.

² The break at the end of the line in *Marc. gr. Z 307* occurs after χαλ-, the first syllable of χαλκῶ. The beginning of the next line, where the second syllable κῶ now stands, has been subject to erasure. The copyist could not have been going to follow χαλ- with a vowel; for according to his usual practice he would in that case either have added the vowel after the λ in the same line, or, which is much more likely, made the line-break

bronze understood as an instrument. If I had the job of editing the Empedocles fragment, I would print κρηνάων ἄπο πέντε ταμών [...] χαλκῶ¹. This would reflect doubt as to whether χαλκῶ should come before or after the five springs. It cannot be ruled out that the text we have is truncated and that a line, or several lines of Theon's original text have gone missing in the process of copying.

It remains for us to reach a conclusion on the validity of the link between the two anonymous pieces of verse quoted by Aristotle in the *Poetics*, on the one hand, and the Empedocles quotation in the introduction to the *Expositio* on the other.

The *Poetics* and the *Expositio*

In order to accommodate ταναήκεϊ, the reading in an important manuscript of the *Poetics*, Maas had no hesitation in clearing a space for it in the *Expositio*. But this was too simple a move. The indications telling against Maas's hypothesis to be found in the primary manuscript of the *Expositio* are too weighty and too numerous for it to withstand. There is no appeal from the verdict. The solution dreamed up by Maas to restore Empedocles' text must be rejected: ταναήκεϊ will not work².

The last attempt to link the *Poetics* and the *Expositio* is stopped in its tracks. The consequences are immediate. Because ταναήκεϊ cannot be read in the *Expositio*, because ἀτειρεῖ in the same work is no more than an uncertain correction itself supplanted by yet another correction (ἀκηρέϊ), because, in short, neither of the two alternative readings for the adjective describing the bronze in *Poetics* 1457 b 14 (ταναήκεϊ and ἀτειρεῖ) is necessarily paralleled in the *Expositio*, Theon of Smyrna (*Expositio* 15.10–11) can no longer provide grounds for attributing the two fragments quoted by Aristotle (*Poetics* 1457 b 13–16) to Empedocles. Theon's quotation and the

after χαλκ-. Therefore, since the λ on the same line as χαλκ- is certain, there can be no doubt that χαλκ- was followed by a consonant in the following line. The possibilities are restricted. Only some part of χαλκός or a word from the same root will fit. Either χαλκῶ or χαλκοῖς is possible. If the κ of χαλκ- was erased when it should have been left, then, since it has, after all, been rewritten, what probably happened was that the corrector erased more than he had actually intended.

¹ Should ἄπο or ἄπο be read? Should ἄπο be treated, with tmesis, as the prefix of ἀποτάμνω or as a postponed preposition (κρηνάων ἄπο for ἄπο κρηνάων)? Hesychius (*Lexicon*, alpha 6705) offers a rare and interesting sense of ἀποτεμεῖν: ἀγνίσαι. However, this sense is not called for in fr. 143. The interpretation that depends on treating ἄπο as a postponed preposition seems better. It looks forward to the second element in the comparison with the preposition ἀπό (*Expositio* 15.11–12): ὁ δὲ Πλάτων ἀπό πέντε μαθημάτων δεῖν φησι ποιεῖσθαι τὴν κάθαρσιν. We must accept, then, that the accentuation in the manuscript is defective (the convention of anastrophe is ancient, as Herodian's evidence confirms): ἀπό written for ἄπο. It should be noted that ἄπο, as it stands in the manuscript after the alterations to ταμόντα (κρηνάων ἀπό πέντ' ἀνιμώντα), must necessarily be a postponed preposition since the verb ἀνιμῶ compounded with ἀπό does not occur, and so could not be found in tmesis.

² There are two other points on which Maas shows himself to be unreliable. He states that the final ε of πέντε is situated in an area where *ist* [...] *die Lesung erster Hand völlig ausradiert*; now the ε is still detectable under the ἄ of ἀνιμώντα; there is indeed an erased area, but it is located between the end of the first ν and the start of the μ, not where Maas says it is. Certainly, the conclusion will be that πέντε ταμόντα is the correct reading. But Maas's assumptions are not borne out by the facts. Second point: Maas thinks that the ι in ἀνιμώντα is long as in ἰωῶ; but on the pattern of the compounds of ἰιάς, the verb ἀνιμῶ has a short ι. Contrary to Maas's belief, the metre of the third foot with ἀνιμώντα is therefore not defective.

two quotations in Aristotle must now be firmly kept in separate compartments. The knot by which Vahlen bound them together must be untied. The fragment χαλκῶ ἀπὸ ψυχῆν ἀρύσας that Diels prints as B 138 in the Empedoclean corpus and links up with the quotation from Theon (fr. 143 Diels), must henceforth be excised from the collection.

The bond has been severed, but there are still some questions which I should like to try to answer. One point relating to the discovery of ταμόντα underneath ἀνιμώντα in the *Expositio* may well leave some lingering doubts. Yes, it is undeniable that it was the *Poetics* that led to the discovery of ταμόντα. Is that not then an irrefutable argument for combining Theon's quotation with those in Aristotle? No, the argument is not irrefutable. The twelfth-century copyist responsible for the vellum manuscript of Theon wrote ταμόντα, the word he found in his exemplar. But the sense the verb had to carry when linked with the five springs was difficult. Someone who read the Empedocles quotation in Theon saw fit to replace ταμόντα with a word much easier to understand in the context and chose ἀνιμώντα. The action of *drawing off* was appropriate to the five springs and fitted the Platonic parallel where the process of purification (ποιεῖσθαι τὴν κάθαρσιν) begins from the five mathematical sciences (ἀπὸ πέντε μαθημάτων). The common element in the comparison that Theon establishes between Empedocles and Plato lies in the necessity to draw or start from five things for the purposes of purification. Aristotle's *Poetics* has, of course, no part to play in the change from ταμόντα to ἀνιμώντα. The transformation of the text rests on the need to make the sense more accessible.

It is worth pointing out that the chosen verb ἀνιμῶ is not used exclusively in the sense of drawing water, whether from a spring or a well. It means, more generally, to *raise*. What is raised may be something other than water, as for example in Iamblichus (*Protrepticus* 21, 122.19) where ἀνιμᾶν is used of the right hands of the non-initiates. It would not however be sensible to jump to the conclusion that ἀνιμῶ was chosen simply because of its connection with springs. We do not know whether, apart from making the sense of the text more accessible, the corrector had some other purpose in replacing ταμόντα with ἀνιμώντα.

The *Poetics* does not offer the verb ἀνιμῶ, it uses ἀπαρύω or ἀρύω. This is an essential point that the advocates of the association between the *Poetics* and the *Expositio* pass over rapidly and without explanation. Let us grant for the moment that an early reader of the manuscript of Theon came across ταμόντα in the Empedocles quotation and was reminded of the double quotation in Aristotle's *Poetics* (1457 b 13–14): what reason would he have to correct ταμόντα the very word that appeared to establish a connection between Theon's quotation and that of Aristotle? Let us suppose, even so, that this reader took it into his head to correct the manuscript in order to suppress the difficulty in understanding occasioned by the verb τέμνω: why would such a man, well-versed in the works of Aristotle and fully aware of the metaphorical equivalence of ἀρύσαι/ταμεῖν and ταμεῖν/ἀρύσαι, decide to write ἀνιμώντα, and not, more simply, ἀρύσαντα? After going to the trouble of erasing the original reading he could perfectly well have inserted ἀρύσαντα

which (1) kept the language of the *Poetics*, (2) fitted the metre, and furthermore (3) retained the aorist tense of ταμόντα (while ἀνιμώντα is a present participle). In choosing ἀνιμώντα rather than what Aristotle had written the corrector betrayed no evidence of an acquaintance with the author of the *Poetics*¹.

Diels could have objected, *But it was no accident that ἀνιμώντα rather than ἀρύσαντα was chosen; ἀνιμώντα enabled the corrector to re-use the μ and the ο that he found in ταμόντα, and that is why he chose it.* We know now that Diels did not have the right data at his disposal: his codicological argument in favour of ταμόντα is without foundation. The μ in ταμόντα and the μ in ἀνιμώντα are not one and the same. The ο in ταμόντα does not directly follow the μ in ἀνιμώντα, contrary to what Diels was able to deduce from Schrader's inaccurate report. There is nothing which might explain why anyone, with the *Poetics* as a background, would choose ἀνιμώντα over ἀρύσαντα. A link with the *Poetics* is, frankly, not plausible.

It is true that it was the *Poetics* that led Vahlen to conjecture ταμόντα in the *Expositio*. It is also true, as a fresh examination of the Venice manuscript has shown, that ταμόντα can indeed be read in the *Expositio*. That is a piece of luck, but it is no more than a happy accident. It is probable that the corrector who erased part of ταμόντα in order to write ἀνιμώντα over the top of it had in mind neither Aristotle's discussion including ἀπαρύσας or ἀρύσαι, nor the work of Empedocles. The arguments of Vahlen and later Diels giving authority to combine the two quotations (Aristotle's and Theon's) do not withstand critical examination.

The shift from the verb *cut* to the verb *draw* – observable in the Venice manuscript – has so far appeared as something exceptional. Commentators on *Poetics* 1457 b 13–14, in which Aristotle exemplifies this phenomenon, have never cited any parallel. There is however at least one, in the Homeric corpus, *Iliad* XIV, 517–519:

[...] διὰ δ' ἔντερα χαλκὸς ἀφύσσε
 δηώσας· ψυχὴ δὲ κατ' οὐταμένην ὠτειλήν
 ἔσσυτ' ἐπειγομένη, τὸν δὲ σκότος ὄσσε κάλυψε.

Two verbs here are interesting: (1) διαφύσσω a compound of ἀφύσσω, a synonym in certain contexts for ἀρύω, and (2) δηῶ, *tear*, a synonym for τέμνω. The verb ἀφύσσω is very often used for drawing wine; ἀρύω is sometimes employed in the same sense², but its field of application is wider, the liquid drawn being in particular water. In the two cases which claim our attention (*Poetics*: ἀπαρύω ψυχὴν; *Iliad*: διαφύσσω ἔντερα), both *draw* verbs are to be taken figuratively. In both cases the bronze that *draws* is a bronze that kills, and the soul leaves the body from the spot where the bronze

¹ P. Maas in *Byzantinische Zeitschrift* 36, 1936, (Abteilung), p. 457, supposed that Michel Italikos, a man familiar with Aristotle's *Poetics*, had altered ταμόντα to ἀνιμώντα. Maas does not explain why the Byzantine scholar should have debased the quotation from Empedocles in this way and departed from the language in the *Poetics*. On Michel Italikos see P. Gautier, *Michel Italikos: Lettres et discours*, Institut français des études byzantines, Paris 1972 (Archives de l'Orient chrétien).

² Liddell – Scott – Jones, *A Greek–English Lexicon*, s.v. Julius Pollux, *Onomasticon* 10.75.1–3, Hesychius, *Lexicon*, sigma 790, Scholia on Euripides, *Trojan Women*, 821.2.

draws. In other words, ἀπαρῶ ψυχὴν conveys an image if not identical in sense to Homer's διαφύσσω ἔντερα, then very close to it. The Homeric image recurs, though without explicit reference to the departure of the ψυχή, in two other places in the *Iliad* XIII, 507–508 and XVII, 314–315: διὰ δ' ἔντερα χαλκός / ἤφυσ'¹.

It should moreover be noticed that in *Il.* XVII, 86 in describing the death of Euphorbus, in a line that echoes *Il.* XIV, 518 the poet varies his expression: it is not the soul that comes out from the wound but blood². There can be no doubt that the blood draws out the soul along with it. By opening a wound, the bronze in *drawing out* from the entrails (ἔντερα) allows the blood and the soul to escape. The blood removed by the bronze gives a concrete sense to the verb *draw*. The bronze cuts, and opens a wound. As it is driven in, it *draws from* the body. It becomes loaded with blood. The drawn blood leaves the body by way of the wound. The drawn off soul leaves the body by way of the wound (χαλκῷ ἀπὸ ψυχὴν ἀρούσας). *Cut* and *draw* are equivalent in sense³.

II Addenda

A

The quotation from Empedocles is taken from the introduction to Theon's account, in which the author seeks to demonstrate in different ways that mathematics must be taught from early childhood in order to purify the soul and to make it receptive of discourses about virtue, in other words, to prepare it for philosophy, particularly Platonic philosophy. He offers a series of four comparisons, in the following order:

1. The role played by *mordants* in the preparation of wool for dyeing (13.4–14.11 Hiller – Plato, *Republic* IV, 429 d–e). The preparation, which has the effect of fixing the dye subsequently applied, involves steeping white wool in a mordant solution. Thanks to this, the wool will keep its colour relatively well after several washings. The comparison with mordants is designed to highlight the benefit of specific preparation if one is to achieve results that will stand the test of time. Discourses on virtue will make an impression that endures all the longer when the mind that receives them has been properly prepared.

2. Purification as the first of the five stages through which participants in the Mysteries must pass (Eleusis – 14.20–25 Hiller). Not all who wish to can take

¹ In these two examples, the verb associated with διαφύσσω is not δηῶ, but ῥήγνυμι; the sense remains *tear*, thus a synonym for *cut*. – The verb διαφύσσω is used without tmesis in *Odyssey* XIX, 450. It is associated with a wound (Odysseus wounded in the thigh).

² *Il.* XIV, 518–519: [...] ψυχὴ δὲ κατ' οὐταμένην ὠτειλὴν / ἔσσοτ' ἐπειγομένη [...]. *Il.* XVII, 86: [...] ἔρρει δ' αἷμα κατ' οὐταμένην ὠτειλὴν.

³ In the *Revue des études grecques* 119, 2006, pp. 532–551, I studied in greater depth the kind of metaphor referred to by Aristotle that is applied from species to species (*Aristote, Poétique 1457 b 13–14: la métaphore d'espèce à espèce*). The idea of using bronze to cut or to gather is to be found in Sophocles, particularly in a lost tragedy (fr. 534), αἱ Ῥιζοτόμοι (*The Root-cutters*, or *Root-gatherers*). – According to D. S. Margoliouth, *The Poetics of Aristotle*, p. 205, in the metaphor cited by Aristotle, the first bronze is a lancet (it draws the life-blood), the second bronze is a container *sharp-edged*, used by the doctor to collect blood.

part in the mysteries: in particular, those with unclean hands are excluded straightaway. Those who are qualified to take part must first purify themselves. Then, the other four stages will follow (initiation, attainment of the grade of ἐπόπτης, binding of hair and crowning with garlands, bliss).

3. Purification through the five springs (Empedocles – 15.9–11 Hiller).

4. Mathematics (consisting of five disciplines) as the first of the five stages of Platonic philosophy (15.11–12 Hiller)¹.

Unless Theon is guilty of flagrant incoherence, his juxtaposition of the preparation for the mysteries – that is the purification excluding those with unclean hands – and the purification through the five springs precludes any suggestion that the Empedoclean purification may concern expiation for a bloody murder (the unclean hands barred from the mysteries), as claimed by Diels in his *Studia Empedoclea*. The purification represented by the five springs is nothing but a cleansing aimed at removing the normal everyday dust and dirt by which the candidates eligible for the first stage of initiation might be sullied.

Theon draws a parallel between the part played by mathematics in relation to the mind and the role of a mordant in dyeing white wool and thus sets up mathematics as the means of preparing the mind for the acquisition of Platonic philosophy. In Theon's treatment, Empedocles, a philosopher, occupies the position that comes closest to the place of honour reserved for Plato. Knowledge is Theon's subject, so it must also be Empedocles' subject, since Theon is quoting him. Empedocles could use the metaphor of the five springs in speaking of organised and increasing knowledge. Here, briefly expressed, is the interpretation I offered in 2004 in an article in the *Revue des études grecques*: *The 'five springs' are the objects of the five senses. 'Cutting from five springs' is to be taken as an image from the artificial irrigation of gardens or orchards, and is intended as an illustration of how knowledge drawn from our senses may be increased.* The content of the quotation is thus the *comparans* of a comparison. The unexpressed *comparandum* is the acquisition of knowledge through the five senses. Before developing this interpretation further, I should like to return for a moment to the establishment of the text. Despite the fact that, in the manuscript of Theon, words have been erased and rewritten on various occasions and parts of the text lost, some certainties nevertheless remain.

1. The original scribe wrote κρηνάων ἀπὸ πέντε ταμόντα and, further on, χαλκῶ.

2. A corrector then erased the initial part of ταμόντα and emended the word to ἀνιμώντα. The bronze would then easily be understood as being a receptacle (which is the common interpretation that fits in with the presence of the five springs – κρηνάων – taken to be springs of water).

¹ Lysis' words, reported in Iamblichus' *Life of Pythagoras* (chap. XVII), draw a parallel between the purification of the soul that must precede the acquisition of the benefits of Pythagorean wisdom, the restriction placed on the disclosure of the Eleusinian mysteries and the use of mordants in dyeing. The idea that there is a need to implant something useful (ἐμφυτεύεν τι χρήσιμον) in the reasoning element (λογισμός) is also present.

3. The original scribe wrote neither ἀτηροῖῖ nor ἀτειροῖῖ, since the horizontal bar of the τ is on an erased area and the way in which the sequence consisting of τ followed by an η or an ε has been executed does not match his writing style. This scribe usually links the τ to the η (the η is linked with the horizontal bar of the τ like the final ε in πέντε) and the τ to the ε (as in πέντε) with a small ε at the end of the horizontal bar of the τ, whereas here the τη in the manuscript is evidently made up of two letters some distance apart from each other, and the τε can only be formed by incorporating a very large ε¹. A corrector put a horizontal bar on the κ to try to turn the word into ἀτειροῖῖ or ἀτηροῖῖ, which, unlike ἀκηροῖῖ, are known adjectives, the effect being both to support the idea of a container used in drawing from the five springs and to give prominence to the fact that the action is associated with something indestructible and solid, just as Theon's argument claims (*sc.* the purification consists in building a sound foundation which will favour subsequent progress).

4. The text that precedes χαλκῶ has been much tampered with: a letter, or a group of letters has been scratched out between the alpha and the consonant that follows (a κ or a τ).

5. Such similarity as this passage may seem to share with Aristotle's *Poetics*, 1457 b 13–14 (= 31 B 138 Diels) is fortuitous. Theon's text does not have ἀρούσαντα, but instead ἀνιμώντα. Further, neither ἀτηροῖῖ nor ἀτειροῖῖ can be read clearly.

B

As soon as it is taken for certain that the verb written in fr. 143 is τέμνω and not ἀνιμῶ, it must be accepted that the object used for cutting – if I may be forgiven for stating the obvious – is in some sense something that cuts. This would be true of a pick or a hoe (μακέλη, σμινύη): they cut the earth, as is illustrated by the expressions used to describe a number of parallel activities: αὔλακα τέμνειν, to plough a furrow, ὄδον τέμνειν, to make a road, διώρυχα τέμνειν, to dig a ditch². This would also be the case with a spear or a sword (I am thinking of ταναηκέῖ χαλκῶ). But it is hard to see how this could be the case with a receptacle, a vase or a cup. Even so, some people have imagined that, in poetic language, a receptacle might *cut* a flow of water or *cut* the surface of the water (when the upper edges of a vessel first enter the

¹ The first hand does not write a large ε after a τ. I have examined all the occurrences present from page 1 verso to page 15 recto (that is 29 pages from the manuscript and 11 occurrences): 1v l. 7 διαμαρτεῖν (1.13 Hiller), 2v l. 12 πολιτεία (2.22 H), 3v l. 4 πολιτείας (3.16 H), 6r l. 6 πραγματεία (7.4 H), 8v l. 15 πολιτεία (10.12 H), 9r l. 6 πολιτείας (10.17 H), 11v l. 2 πολιτεία (12.26 H), 13r l. 11 ἐποπτεία (15.1 H), 13r l. 12 ἐποπτείας (15.2 H), 14r l. 3 ἐποπτεῖαν (15.16 H), 14r l. 5 πραγματεῖαν (15.17–18 H). All these sequences of three letters (τεῖ) are remarkably uniform in size, relatively small and always written with the ε linked to the tip of the cross of the τ. Additionally, six occurrences show a ligature between the τ and the ε: 9r l. 6 (10.17 H), 11v l. 2 (12.26 H), 13r l. 11 (15.1 H) and 13 r l. 12 (15.2 H), 14r l. 3 (15.16 H), 14r l. 5 (15.17–18 H). None of these cases displays characteristics matching those of ἀτειροῖῖ – in particular, the spaces between the three letters. We can assert that the original scribe did not write ἀτειροῖῖ.

² Cf. the bronze pick in Apollonius of Rhodes, *Argonautica*, 1532–1533. For the vocabulary of tools, see M. C. Amouretti, *Les instruments aratoires dans la Grèce archaïque* in: *Dialogues d'histoire ancienne* 2, /1976, pp. 33–34.

water). There is no support for so subtle an interpretation. Moreover, it would not provide any form of comparison that would justify introducing the quotation in the context of the acquisition of knowledge.

In *Les cinq sources dont parle Empédocle*, I suggested that the action described in fr. 143 consists in digging irrigation channels from five springs. That such channels were dug out with a bronze tool would be a possibility. Yet, the participle that Theon gives us, ταμῶν, lacks an object. Channels or conduits for water, the text has nothing to say on the matter. It is then clear that we are dealing with a piece of interpretation, the more so when we consider the quotation as the *comparans* of a comparison.

What significance is to be attached to the work of irrigation in fr. 143? The irrigation in question aims at making fruitful within oneself the knowledge one acquires of the world. The five springs are the streams of data processed by the five senses, symbolised metaphorically by the palm of the hand with its five fingers (fr. 3.9). The writing of fr. 143 seems thus to have been influenced by Hesiod, when he calls the hand *pentozos*, the *five branches*, in a passage of advice on how to avoid pollution (*Works and Days*, 737–759). The vocabulary used in this passage is very close to that used in fr. 143: κρηνάων, πέντοζος, τάμνειν, σιδήρω.

One might believe that processing the stream of data gathered by the five senses is a natural thing that does not require any work. But the philosopher from Akragas sees things differently. According to Empedocles, one must constantly strive to avoid being distracted from philosophy by the natural stream of things that leads to its dissipation (fr. 110). The gathering together of the five springs through a process of channelling is a purification in itself. Empedocles has already pointed out in fr. 2 and 3 that he held himself aloof from men whose thoughts had lost their edge and who were capable of no more than passive learning, praying that a pure spring should flow from his lips. There is a divine background to what he says. Empedocles' Muse, who helps him to acquire his degree of knowledge, is probably *Nêstis*–Persephone, goddess of water and goddess of the vegetal power. In short, the seat of knowledge in man, in the sense in which Empedocles understood it, is a well-watered place, a garden of *Nêstis*. I shall return later to the evidence for identifying *Nêstis*–Persephone as Empedocles' Muse, for that is a crucial point. So far, fr. 143 has provided us with our starting–point, the five springs, along with an action and a means, *viz.* cutting with a bronze tool. What we are trying to do now is to hazard a guess as to our destination: this can be conjectured to be an irrigated garden and, to unlock the meaning of Theon's quotation, it would be the part in us where knowing takes place¹. In Empedocles, the knowing subject is depicted as a grasping hand, its main location within the body being the *prapides* (fr. 110, 129, 132), the *splanchna* (fr. 4) or the *phrenes* (fr. 5, 15.1, 17.14, 23.9, 114.3, 133.3, pap. Strasb. a[ii] 29 MP). Prior to Empedocles, authors like Pindar and Aeschylus used metaphors from plant life to describe the development of the thoughts or

¹ See J.–C. Picot, *Les cinq sources dont parle Empédocle*, p. 432.

designs within the breast¹. Thus, it should come as no surprise that Empedocles, as a poet, should develop an image already sketched by other poets before him.

In his own work on Empedocles, M. Rashed has accepted several lines of interpretation that I have myself followed or sometimes even initiated, and which in any case, I hope I have been able to support with a number of arguments in previous articles. A rapid survey of these articles may prove useful before we proceed to Rashed's contribution.

(1) *Sur un emprunt d'Empédocle au Bouclier hésiodique*² deals with the interpretation of the fragment concerning the ear (fr. 99: κώδων. σάρκινοσ ὄζοσ). In this article, I established a connection between the Muses, the branch (ὄζοσ) of the Muses and the ear (σάρκινοσ ὄζοσ), and then outlined an association between (a) the palms, παλάμαι (fr. 2.1, 3.9), (b) the five branches or Hesiodic πέντοζοσ, (c) the branch, ὄζοσ, meaning *ear* and (d) the five organs of sense. Finally, I introduced the idea that Empedocles' Muse might be *Nêstis*, deity of water, otherwise known as Persephone, goddess of the vegetal power.

(2) In *L'Empédocle magique de P. Kingsley*³, it is claimed that Empedocles' Muse, whom he himself, with no great originality, calls Calliope (fr. 131), is lovely Nemertes (fr. 122.3), The Unerring, the source of truth, and another name for *Nêstis*–Persephone. The Empedoclean Calliope cannot possibly be the one who usually sings of king Zeus. In Empedoclean philosophy, bonds between divinities fall within the province of Aphrodite, the foam-born goddess. Now Plutarch reports that *embracing Philotes* (σχεδύνη Φιλότησ, fr. 19) is associated with water. All in all, the conclusion must be that Aphrodite, *Nêstis*–Persephone, Empedocles' Muse and the lovely Nemertes are closely related to each other in the Empedoclean pantheon.

(3) There is scarcely any need here to say more on the subject of *Les cinq sources dont parle Empédocle*. *Nêstis*–Persephone, Empedocles' Muse, is active in the acquisition of knowledge.

(4) *La brillance de Nêstis (Empédocle, fr. 96)*⁴ aims at understanding the meaning of the expression *the glitter of Nêstis* in some lines describing the composition of bone. It is suggested that this *glitter* (αἴγλη) is a mixture of water (*Nêstis*, Persephone, goddess of darkness) and air. If so, it is remarkable that Empedocles gives the name of *Nêstis* to a *mixture*. Let us draw the inference, which is moreover supported by Plutarch's account, that *Nêstis* is indeed associated with *embracing Philotes* (fr. 19).

¹ R. B. Onians, *The origins of European thought about the body, the mind, the soul, the world, time and fate*, Cambridge University Press, Cambridge 1951, p. 30. Pindar, *Ol.* VII, 7, *Pyth.* II, 73–4, Aeschylus, *Seven against Thebes*, 593–594. In the last passage the seer Amphiaraus is described as *harvesting a crop from the deep furrow* [βαθειᾶν ἄλοκα] *in his phrên, from which wise counsels grow*. Bearing in mind the expression αὐλακα τέμνειν, the sense of the verb τέμνειν is perhaps not alien to a context such as this.

² In: *Revue des études grecques* 111, 1/1998, pp. 42–60.

³ In: *Revue de philosophie ancienne* 18, 1/2000, pp. 25–86.

⁴ In: *Revue de philosophie ancienne* 26, 1/2008, pp. 75–100.

C

Now let us turn to Rashed's contribution.

Rashed tells us that the liquid part of the eye is called κούρη in what is, in fact, an allusion to Persephone and, thereby, to *Nêstis*¹. At the centre of the eye lies what is called *ogygian* fire, suggesting an analogy with the island of Ogygia familiar from the *Odyssey*, the navel of the seas, where Calypso conceals Odysseus. Like Ogygia, the fire at the centre of the eye is set in the midst of waters. The eye is the work of Aphrodite, who, at least for the moment, takes the form of Odysseus building his raft. The contribution that Rashed's study brings to our reading of fr. 143 is its demonstration of the importance of water and the island of Ogygia in the composition of the eye, which provides, in my view, confirmation of the identification of Persephone=κούρη with *Nêstis*. To add emphasis I should like to take the point a little further than Rashed did. Ogygia, the navel of the seas, the mythical place where the raft was built, possesses in particular four springs arising close to each other which flow in different directions and water the meadows where parsley and violets grow (*Odyssey* V, 70–73). These springs and meadows are significant. The setting chosen by Empedocles to depict the organ of knowledge dear to Aphrodite, the eye, is, as we can see, one in which water and attractive plant life abound.

Rashed's work on the clepsydra (fr. 100), provides elements that are of decisive importance as a foundation for the interpretation I have offered of fr. 143². Fr. 100 falls into three parts: (1) an anatomic description of respiration (*comparandum*), (2) an account of the way in which a water-collecting clepsydra (a kind of pipette, in this instance being played with by a girl) functions (*comparans*), (3) the description of the respiratory process through movements of blood and air (*comparandum*). Rashed argues that the clepsydra will call to mind a fountain in Athens called Κλεψύδρα, which was not far from the Eleusinion and, thus, not far from the temple of Demeter and Persephone, and which was built on a spring which takes its name from an aquatic nymph, *Empedô*. Once a year, the statues of Aphrodite *Pandêmos* and *Peithô* were washed with water from the Κλεψύδρα fountain. For Empedocles, these various data – the clepsydra, Persephone, the spring, *Empedô*, the cleansing, Aphrodite – must be interconnected. The girl, παῖς, in the simile in fr. 100 now takes on the mantle of Persephone, who is both Κούρη and Παῖς. Her hand, plunging the clepsydra into the water and taking it out again, opening and closing the orifice on the top of the clepsydra so as to let the air come out or keep it in, carries out a function equivalent to that performed in the body by the diaphragm (*the prapides*), which is essential to breathing. Rashed does not miss the opportunity to point out that *Empedô* must remind us of both Empedocles himself and of *Nêstis*. Through their various equivalents, against

¹ M. Rashed, *The structure of the eye and its cosmological function in Empedocles. Reconstruction of Fragment 84 D.-K.* in: *Reading ancient texts*, vol. 1: *Presocratics and Plato – Essays in honour of Denis O'Brien*, (eds) S. Stern-Gillet & K. Corrigan, Brill, Leiden – Boston 2007, pp. 21–39.

² M. Rashed, *De qui la clepsydre est-elle le nom? Une interprétation du fragment 100 d'Empédocle* in: *Revue des études grecques* 121, 2/2008, pp. 443–468.

a background of clepsydra and blood in movement, a picture emerges of the human self with its *prapides*, the hand, and finally, the goddesses dear to Empedocles – *Nêstis*, Persephone, *Empedô*, Aphrodite. These are the main points supplied by Rashed's article that bear on my argument.

To these I would add the following observations: in fr. 100.5, the object of the verb τετμήσθαι is *an easy path* (εὐπορίην). This last concerns the air-passages (διόδοισι) in the skin. These passages are also called furrows (fr. 100.3: ἄλοξιν). This, coming from the writings of Empedocles himself, is a significant parallel favouring the acceptance of the participle ταμῶν in fr. 143, which I would like to associate with a tool capable of digging irrigation canals or channels. Yet, there is one element left that Rashed did not take up and which is of central importance if we are to continue weaving our interpretative web round fr. 143: the clepsydra is made of bronze (fr. 100.9 and 16). The bronze referred to in fr. 143 and in fr. 100 raises certain questions. According to J. Bollack, *archaeology does not provide a single example of a metal clepsydra. The clepsydras that have survived are made of clay*.¹ In reality, we do have at our disposal an example of a bronze clepsydra, the bronze from Galaxidi displayed in the National Archaeological Museum of Athens (inv. X 7994)². A bronze clepsydra was comparatively more expensive than one made of clay, and for that reason probably less common. They could be used in different ways³. A bronze pick or hoe must have been a rare sight, if such things were to be found at all, at a time when bronze had been long since replaced by iron. And we may readily recall that the famous bronze sandals which are associated with the legendary figure of Empedocles have all the appearance of something unusual enough to be worth remarking upon. The question that arises then, at least for the clepsydra and for the presumed implement in fr. 143 is: why bronze?

We know that bronze is synonymous with solidity. No doubt this characteristic looms large in Theon's argument, in that he insists that mathematical knowledge forms the solid and useful foundation upon which to base all subsequent progress in philosophy. But bronze is not the *knowing subject*. It is the tool in the hands of the knowing subject. We must then suppose the quality transferred from the tool to the subject using it. It is not impossible for a poet to operate in this way. The figure of speech involved is what we call *metonymy*. Empedocles has already used it in fr. 6.2 when he calls one of the four roots of all things, the one that the ancients identified with

¹ J. Bollack, *Empédocle*, III, *Les origines, commentaire 2*, Les éditions de Minuit, Paris 1969, p. 485.

² For pictures of clepsydras, see C. Gallavotti, *Empedocle. Poema fisico e lustrale*, Arnoldo Mondadori, Milan 1975¹ (1993⁵), unnumbered pages between 246 and 247. See also his text, pp. 256–257.

³ The article by C. S. Clermont–Ganneau, *Une 'éponge américaine' du VI^e siècle avant notre ère* in: *Revue archéologique* 34, 1899, pp. 323–328, examines the possibility that the clepsydra from Beotia exhibited in the Louvre (which is the clepsydra that Bollack uses as an example) may have been a shower reservoir. Though Clermont–Ganneau does not cite Empedocles, he makes an interesting point (p. 328) which would find an echo in Empedocles' writings: *In order to remain easy enough to handle and lift above the head with one hand without too much effort, the device, when filled with water, must not exceed a reasonable weight*. Empedocles not only puts the clepsydra into the hands of a young girl but also makes it clear that bronze is something easy to handle (fr. 100.9: εὐπετέος χαλκοῖο).

fire, Ζεὺς ἀργής¹. It is not just its solidity that makes bronze a remarkable alloy. It is the fact that this hard metal, often described as *indestructible*, is a combination of two soft metals, tin and copper, that are mixed together in a certain proportion to each other (which is not a simple matter of putting together an equal volume of each). Now, in Empedocles, the goddess of mixtures is Aphrodite. I venture to suggest that by the very fact of being an alloy, bronze appears as a living metal, that is, a substance resulting from the close combination of different materials, just as in the case of bone different elements are combined in very precise proportions through the intervention of Harmonia, and take on a new and unsuspected character. In recommending the acquisition of knowledge from the five springs, Empedocles is urging mankind to blend together the evidence from five separate senses just as it has learned, in the metallurgical sphere, to blend the two ingredients that go to produce bronze. Here again, it is must be recognised that Empedocles is transferring to the knowing subject properties which he is aware belong to the material of the tool. This is still poetry, after all.

And how does fr. 100 figure in all this? To propose that a part of the body, namely the tissues comprising the lungs, is made in the image of a bronze clepsydra brings into play the works of Aphrodite who imposes harmony and due proportion upon her creations. We were trying to work out the *destination* that fr. 143 fails to supply. We claimed – confident in our belief that Theon must be quoting Empedocles on the subject of true and sound knowledge – that this destination would be the knowing subject, the one that grasps with the *pentozos*. At this point, on the basis of a quite different analysis, Rashed, invites us to confirm this interpretation. The arrival point is the diaphragm, which is also Persephone's hand. Now, in Empedocles, although elements and power acting on elements must be distinguished conceptually, the image of Persephone, at least in some stages of the cosmic cycle, tends to become confused with the image of Aphrodite – also known as Cypris, *Philotes* – such is the extent to which *Nēstis*–Persephone contributes to Aphrodite's works². Because Persephone is *Nēstis*, the diaphragm is also the place in which the aquatic nymph *Empedo* resides.

¹ Except in Empedocles, Zeus is never referred to as ἀργής. Traditionally, it is the thunderbolt that is ἀργής (cf. ἀργικέραυνος, ἀργήτα κεραυνόν, ἀργήτι κεραυνῶ). Except in fr. 6, Empedocles uses ἀργής to describe light: ἀργέτι [...] ἀργήτι (fr. 21.4). A thunderbolt is a manifestation of light. What can we infer from that? Because light comes from fire (as is clear from fr. 84), and because the thunderbolt shines thanks to the fire it contains, it then comes about that Zeus ἀργής is the fire, but it is very surprising that Zeus should take the place of the thunderbolt or of light. Zeus throws thunderbolts but he is not himself the thunderbolt. We are not ordinarily inclined to confuse a weapon with the person who carries it. Yet, in Empedocles, everything happens as if it made sense to confuse them: Zeus becomes the thunderbolt. It is metonymy that does the trick. That is not all. Ζεὺς ἀργής is not only the thunderbolt, he is fire in all its manifestations. In the same way, Zeus is not only ἀργής light; for light is just an emanation or a product of fire (again: fr. 84). In fact, the metonymy (in which the subject is described in terms that apply to the remarkable instrument he holds in his hands) is here combined with a specifying synecdoche (in which a part is made to stand for the whole). Two species have, by themselves, to represent all the species of a genus and the genus itself. In the example under review, (fr. 143), on the rhetorical model provided by Ζεὺς ἀργής, the bronze held in the hand would transfer its qualities to the hand, and more generally, to the knowing subject.

² Empedocles involves himself with the constitution of living mixtures on several occasions: twice in connection with Cypris (fr. 75.2 and, 95), another time with the two painters (fr. 23.3), in this case in making a comparison. Could the two painters represent the two hands of Cypris? – Plutarch reports that Empedocles

Rashed assumes *Empedo* to be an Empedoclean *sphragis* centred on ἔμπεδος. Let us develop this *sphragis* further by adding to it the idea of bronze as a living metal. In bringing in the diaphragm, Empedocles is encouraging us to increase our knowledge (fr. 110.1–5). This is where what is firmly anchored can stand the test of time and grow. Now, what is literally *firmly fixed* in the ground is ἔμπεδος¹. It is natural to think of deep-rooted trees, for trees, like bronze, convey the idea of physical solidity and – according to Empedoclean logic – of Aphrodite's presence. Knowledge that grows on lands irrigated by the five springs would then be like trees with roots that are ἔμπεδοι. Empedocles provides two *hapax legomena* with *ἔμπεδο- : ἔμπεδοφυλλον, ἔμπεδο-καρπα (fr. 77–78). Is it just an accident that Empedocles links his name with the world of plants? Can it also be mere coincidence that he gives the name ῥιζώματα, *roots*, to the four elements that are the constituents of everything, which are entailed also in knowledge? I do not think so. The language and imagery Empedocles employs follow a consistent pattern. But the same is also true of his subject matter: Persephone, the goddess of plant power is Empedocles' Muse.

At this point a note or two of clarification may be in order. Empedocles calls his Muse by the name of Calliope. Her function is to help the philosopher-poet in his quest for knowledge. In what respects does she come to coalesce with *Nêstis*–Persephone? The answer is to be found in Empedocles' fragments. The poet draws a parallel between water and knowledge. Nemertes (fr. 122.4), a sea goddess, is never mistaken. Her knowledge is sure. She is probably linked to Wisdom, who appears in fr. 123.3 (Σόφη restored from Cornutus' manuscripts, in a line that then would read: Ἀφορῆ τε Σόφη τε καὶ Ὀμφαίη <σκοτόεσσα>²). In fr. 3, Empedocles refers to the pure spring that flows from his lips (fr. 3.2). His Muse is described as *white-armed* (fr. 3.3), a description that applies to Persephone, and so also to *Nêstis*. Finally (fr. 23.9–11), lest Pausanias be misled into believing that mortal things can come from anywhere else but this one spring (πηγή) he must be aware that he is listening to the words of a deity. The goddess in question is Empedocles' Muse. And, to complete the circle, the Muse is to be identified with Aphrodite, whose hands, like painters' hands (fr. 23, 1–8), create mortal mixtures.

described the moist element as *adhesive Love* (*De primo frigido* 952 B 10–11: 'σχεδύνην' δὲ 'Φιλότητα' τὸ ὑγρὸν ἐκάστοτε προσαγορεύων). In other words, *Nêstis*–Persephone is assimilated with Aphrodite, Cypris and *Philotes*.

¹ In the *Iliad* XII, 1–33, Homer tells how the Achaean wall, which was built without offering splendid hecatombs to the gods, was destroyed by Apollo, Poseidon and Zeus. This Achaean wall is twice called ἔμπεδος. It was wrecked by floods of water thrown against it, floods that resulted from the diversion of eight rivers from their normal courses to form a single torrent, and rain sent by Zeus. Empedocles' story would be quite the reverse: by uniting the flow from the five springs, mankind could build an edifice of knowledge that would really last, that would be genuinely ἔμπεδος. Empedocles' theme is not destruction. What he is talking about is the construction of a piece of work that is alive. His divine patrons are not Apollo, Poseidon or Zeus but goddesses who are the associates of Aphrodite.

² That new line is proposed in a forthcoming article: *Sagesse face à parole de Zeus*. See <http://sites.google.com/site/empedoclesacragas/sagesse-face-a-parole-de-zeus>.

D

In the article *Les cinq sources dont parle Empédocle* the idea is put forward that these springs represent the flow of data that reaches the sensory organs¹. One might assume, then, that, for Empedocles, there would be five organs of sense. Today we take it for granted that the number is five, just as was already obvious to Aristotle and Theophrastus. But was it quite so obvious to Empedocles? T. Vitek, in an article yet to be published, claims that Empedocles recognised only four senses: [The four roots] *are, according to Empedocles' doctrine, the building blocks of the world. Fire, for example, forms the connection between the sun, human beings and sight; in the same way air links the sky, birds and hearing; and earth links stones, roots, plants, touch, taste; and finally water links the sea, fishes and, most likely, smell.* Vitek adds a note: *The four senses: cf. Aristotle, De sensu 441 a 3 (A 94. 2), Theophrastus, De sensu 9 (A 86, par. 9).* In Vitek's view, Empedocles did not distinguish touch and taste. If this is so, it is obvious that the interpretation I have offered of fr. 143 is wholly or partly wrong, since the number five is essential to it. Is Vitek right?

It is true that no passage clearly shows that Empedocles conceived of five senses. But neither does any passage state that he conceived of four. The two pieces of evidence from Aristotle and Theophrastus appealed to by Vitek are inconclusive. Thus, when Aristotle says that taste is a species of touch, this does not mean that Empedocles did not make a distinction between taste as a species and touch as the genus to which it belonged. The fact that the sense of taste is localised in the tongue – which indeed, like the skin of the fingers for example, can feel both heat and cold – makes the tongue a quite separate organ from the organ of touch, *viz.* the skin. The fact that the tongue is an organ of *both* taste *and* touch does not in the least prevent Empedocles from regarding the skin by itself as an organ of touch without lumping the tongue in with it. In fr. 90, Empedocles says that *sweet seized on sweet, sour rushed on sour* (γλυκὸν μὲν γλυκὸν μάρπτει, πικρὸν δ' ἐπὶ πικρὸν ὄρουσεν). He is being quoted² in a discussion on food, not specifically on taste, but it cannot be denied that one can only tell sour from sweet by using one specific sense, namely the sense of taste. It is then highly likely that Empedocles recognised a sense of taste that was separate from the other senses. Besides, Ancient Greek vocabulary distinguished between taste and touch by using separate terms, which would, incidentally, have led Empedocles, as a Greek, to consider taste and touch as independent senses.

For his part, Theophrastus states that Empedocles does not go into detail on either taste or touch, giving no indication as to how these work or through which organs. Once again, there is nothing to show that Empedocles was so totally confounding touch and taste that he believed that it was just a case of there being two words for one and the same faculty.

¹ See J.–C. Picot, *Les cinq sources dont parle Empédocle*, p. 425, n. 60.

² Plutarch, *Quaestionum convivalium* IV 1, 3, 663 A 10, is our witness.

Besides, Viték would like there to be a one to one correspondence between the four elements (fire, air, earth, water) and the faculties of perception. There is no formal evidence to support that. It can easily be accepted that fire plays an important role in sight, and air in hearing, but that is not sufficient to entitle us to conclude that something *other* than fire or air is required for a sense *other* than sight and hearing, or to exclude earth and water from any part in the functioning of sight and hearing. Water plays an important role in sight since the pupil where images are formed is aqueous. In his article *The structure of the eye and its cosmological function in Empedocles*, Rashed has provided strong arguments to show that the presence of water is essential. Earth, and not just air, is involved in hearing, for the resonance is produced by two solid components striking each other. Furthermore, a diver can hear some sounds underwater, where there is obviously no air. Empedocles, living as he did by the sea, must have been aware of this. And what about smell which seems to depend much more on air than on water which, on Viték's interpretation, would have to operate in conjunction with water? The one to one match between the four elements and the senses – which have then to be limited to four – does not seem to be useful to Empedocles' theory. What we know about it points rather to the idea that the functioning of each sense relies on the collaboration of several elements (fire, air, earth, water).

An additional argument which, to me, strengthens the case for the hypothesis that the five springs are linked to the five senses is the fact that Empedocles, in fr. 2.1, chooses *hands* (palms: *παλάμια*) to designate the senses. Now Hesiod calls the hand *πέντοζος*, the five branches, in a line that could serve as a backdrop to fr. 143.

E

In 2009, M. Laura Gemelli Marciano published the second of the three volumes of *Die Vorsokratiker* (Band II: *Parmenides, Zenon, Empedokles*, Patmos, Artemis & Winkler, Düsseldorf 2009). This book contains a selection of fragments and testimonia devoted to Empedocles. Number 181 of this selection reproduces Hiller's text (15.9–11), as amended by Diels, taken from the introductory lemma in fr. 143 Diels:

Ὁ μὲν γὰρ Ἐμπεδοκλῆς
κοηνάων ἀπὸ πέντε ταμόντα, φησὶν, ἀτειροί χαλκῶι
 δεῖν ἀπορρύπτεσθαι.

The underlined words type are supposed to belong to a line by Empedocles. Gemelli Marciano offers the following translation of Empedocles' words:

wenn man aus fünf Quellen mit unverwüstlichem Erz geschöpft habe.

The verb *schöpfen* is not a direct translation of the verb *τάμνω*; it is an interpretation (suggested by Diels, who writes *schneidend* [d. h. *schöpfend*]). Certainly, in such a context, *cutting* facilitates *drawing* (just as digging a well facilitates drawing water), but strictly speaking, the two actions should not be confused.

Gemelli Marciano does well not to include fr. 138 (*χαλκῶι ἀπὸ ψυχῆν ἀρύσας*) in her selection of fragments and testimonia. In her commentary, she expresses doubts as to whether there is any connection between fr. 143

and fr. 138, and thus as to whether fr. 138 should be attributed to Empedocles. But in that case why keep the text offered by Diels, who prints πέντε ταμόντα, rightly declining to follow Hiller (who prints πέντ' ἀνιμῶντα), yet stubbornly retains ἀτειοεί, a word which does not fit the metre of the line and was found in an unattributed fragment (ταμῶν ἀτειοεί χαλκῶι) attached to fr. 138? Why does she judge by two different yardsticks? If Gemelli Marciano believes that fr. 138 was not written by Empedocles, she should also point a finger at ἀτειοεί in fr. 143. In the word which precedes χαλκῶι, and which has suffered a series of alterations, a letter or group of letters has been scratched out between the alpha and the consonant that follows (a κ or a τ). Now, Diels knew about this erased area since it was mentioned in the letter that Schrader wrote to him. But Diels took no account of this, whereas he had the good sense to keep ταμόντα. In fact, unlike πέντε ταμόντα, neither ἀτηοεί nor ἀτειοεί, which, with a little imagination, can be got out of the manuscript, are original readings. As for ταναήκεϊ, which Gemelli Marciano reports in her apparatus criticus, it is pure fantasy imported from the unattributed fragment, linked to fr. 138. Yet, since fr. 138 justly deserves to be removed from the Empedoclean corpus, we should not hesitate for a second before consigning ταναήκεϊ to the same fate, as entirely irrelevant to the manuscript of Theon.