

THE HERCULANEUM LIBRARY: SOME RECENT DEVELOPMENTS

The magnificent Villa of the Papyri at Herculaneum, which lies to the north of the Roman town, was first discovered by tunnelling in the 18th century. The plan of it was made by the engineer Carl Weber, working under the direction of the Spaniard Roque Alcubierre under the direction of King Charles III. The papyri from the Villa were discovered between the years 1752 and 1754. The papyrus-rolls, each and every one of them a literary text, consist of two kinds: a small but unique collection of Roman literature, and a much larger but equally unique philosophical library, which is, in my view rightly, considered to have been the personal library of Philodemus. The recovery of this library caused enormous excitement during the Enlightenment, which was replaced by terrible disappointment once it became clear that these were 'only' philosophical texts, which had been badly damaged and were legible only with the greatest difficulty and only in part. They have remained harder to study than any other papyri which survive, which is one reason why it has taken scholars up to two centuries to produce reliable texts of many of them.

It is now clear that the papyri were preserved by a pyroclastic flow of superheated gas, steam and mud, which, in a few instants, swept over the town some hours after the eruption had started, burying it in material which turned to the soft rock called tufa, and killing instantly the hundreds of people hiding in the arcades by the harbour. Any material containing carbon was carbonised without being entirely burned, at a temperature of 300-320 degrees Celsius.¹

¹ C. Basile, 'Le cause che hanno determinato i diversi stati di conservazione dei papiri ercolanesi', in M. Capasso, ed., *Il rotolo librario: fabbricazione, restauro, organizzazione interna*, Galatina 1994, 1-26.

The result is that the papyri, now kept in the Biblioteca Nazionale di Napoli, were preserved in a blackened and often warped and twisted state, the result of damage from water or steam during the eruption, at or shortly before the moment when they were carbonised. Since the ink is almost the same shade of black as the fibres of the papyrus, much of the material can be read only with great difficulty. However, since the foundation of the Centro Internazionale per lo Studio dei Papiri Ercolanesi by the late Marcello Gigante in 1970 this field has witnessed great progress. This has been partly, but far from entirely, for technical reasons. Basic binocular microscopes were introduced only by Eric Turner in 1971; much better microscopes, with an annular light round the lens, began to be used only in 1996. Such an annular light is essential if the shadow of the microscope itself is not to hinder the reading of the papyrus below it. Every text produced before these microscopes were used probably needs to be reedited. At the same time scholars began to study the papyri from colour slides taken with a ring-flash around the lens, which can be scanned onto a CD-Rom and enhanced using Adobe Photoshop, to improve the brightness and contrast.² A similar method, developed by Knut Kleve,³ is the use of assemblages of microphotographs, although the process of reassembling these into coherent text has been very slow.

Other forms of progress have been derived from archival and philological research. I rediscovered by accident a large stack of transcripts made during the opening of the papyri, from about 1810 to 1830, by so-called *interpreti*.⁴ The *interpreti* were the philologists who were employed to verify the drawings of the copyists, which in many cases are our only surviving record of the papyri. Most of their transcripts offer little that was not otherwise known, but at least some of them offer new readings and fragments. In addition, David Blank posited that the papyri were first numbered and catalogued in around 1785 by Father Antonio Piaggio, the Genoese friar who devised the famous machine for opening the papyri. His conjecture

² For an example of an enhanced image see my book *Philodemus, On Poems 1*, Oxford 2000, Pl. 1.

³ 'How to read an illegible papyrus: Towards an edition of *P. Herc.* 78, Caecilius Statius, *Obolostates sive Faenerator*', *Cronache Ercolanesi* 26 (1996) 5-14.

⁴ For illustrations of these transcripts see *Philodemus, On Poems 1*, Plates 2-3 (by a printer's error the caption of Pl. 2 has been put under Pl. 3 and *vice versa*).

was subsequently confirmed when part of the catalogue was rediscovered in the Archaeological Museum in Naples; this has now been published.⁵ Further progress has come from the realisation, achieved independently by Dirk Obbink and Daniel Delattre, of how the papyri were taken apart, and as a result how they need to be put back together. As a result, Delattre has reconstructed an entire Herculaneum roll, 11.3 metres in length, namely Philodemus' *On Music IV*, which will shortly appear among the *Editions Budé* series of *Les Belles Lettres*.⁶ Using the same method, I have completed a reconstruction of Philodemus' *On Poems 1*, at least 16 metres in length,⁷ and Dirk Obbink is now finishing the reconstruction of his *De Pietate*, having already published the first half of it.⁸

Incidentally, the rediscovery of the manuscripts of the *interpreti* has helped to confirm a startling hypothesis about the maximum length of Greek papyri. It used to be thought that, both at Herculaneum and in Egypt, the maximum length of a Greek book-roll was about 10 to 12 metres. Rolls in the various forms of ancient Egyptian were known to be much longer. In an important thesis of 1992 which is still unpublished, William A. Johnson undertook a computer-aided reconstruction of *volumina* of long prose-works found at Oxyrhynchus in Egypt. Assuming that each Book occupied a single roll, he calculated, on the basis of the number of letters in each surviving column, how many columns the entire work would occupy in the same format. The results were unexpected. He found that some rolls containing prose-works could be of great length: two rolls of Book I of Herodotus' *Histories* were 20 and 23 metres long respectively, a text of Plato's *Gorgias* was about 25 metres long, another of Book I of Thucydides' *History* was 27 metres long, and a roll of Herodotus Book VII was over 29 metres long.⁹ Now

⁵ D.L. Blank and F. Longo Auricchio, 'An Inventory of the Herculaneum Papyri from Piaggio's time', *Cronache Ercolanesi* 30 (2000) 131-48.

⁶ It has formed the topic of his unpublished thesis *Philodème de Gadara: Commentaires sur la musique, livre IV*, diss. Paris IV (Sorbonne), 2000. See further his articles in C. Auvray-Assayas and D. Delattre (edd.), *Cicéron et Philodème: la polémique en philosophie*, *Etudes de Littérature Ancienne* 12, Paris 2001.

⁷ *Philodemus, On Poems 1*, Oxford 2000.

⁸ *Philodemus, On Piety Pars I*, Oxford 1996.

⁹ *The Literary Papyrus Roll: Formats and Conventions. An Analysis of the Evidence from Oxyrhynchus*, Ph.D. diss. Yale University, 1992.

it transpires that rolls could be equally long at Herculaneum: for D. Obbink tells me that one of the *interpreti* reports that Philodemus' *De Pietate* was all contained in a single roll, and not in two as was formerly thought; from this it follows that its 367 columns filled a *volumen* over 23 metres long.

Another source of progress from which I have benefitted is help from mathematicians with the mathematics of the spiral, which is what a papyrus-roll is when one views it end-on. It turns out that, if the circumference and the thickness of the papyrus is known at any point, one can deduce mathematically how long the roll was, and by how much each successive circumference diminishes towards the centre of the roll. This latter fact is very useful when one is trying to place fragments whose position is uncertain. Every carbonised papyrus which I have seen, including those from Petra in Jordan, breaks into two sections (*sezioni*) per circumference; the section from each side has a characteristic shape, even though each successive circumference gets smaller. If you can measure the sections exactly enough, you can determine where they come from in the roll; to do so, J. Fish has introduced the use of electronic calipers. I have explained the mathematics elsewhere,¹⁰ and will not go into detail here, but these methods are generally applicable to papyri which were once rolled up.

The technological progress has continued, in spectacular fashion, with the application by Dr Steven W. Booras of multi-spectral digital imaging to the rolls; the images produced can in turn be enhanced digitally using Adobe-Photoshop.¹¹ This technique was developed by NASA for viewing very distant and very dark objects, like remote planets such as Pluto or those revolving around other suns than our own. But it has proved remarkably effective when applied to burned manuscripts, and I suspect that it may also quickly transform our ability to decipher palimpsests. It was first applied to the carbonised papyri from Petra in Jordan, with mixed results. In the summer of 2000 Dr Booras' team took digital images of most of the texts in the Herculaneum library, mostly at infra-red wavelengths of 920-940 nanometers; they returned early in 2002 to finish the job. The

¹⁰ *Philodemus, On Poems I*, 109.

¹¹ See Steven W. Booras and D.R. Seely, 'Multispectral Imaging of the Herculaneum Papyri', *Cronache Ercolanesi* 29 (1999) 95-100.

Herculaneum papyri proved much more amenable to this method than did those from Petra. The images of them are not at all attractive but they are extraordinarily clear, and far exceeded expectations. However, they are not totally reliable, for two reasons: the buckling of the papyri caused by water-damage, and the frequent presence of multiple layers, which the Italians call *sottoposti* and *sovrapposti*. These are now the main technical obstacle to the study of those papyri which have been opened. This problem affects how one reads them, whether from the originals or from images. When reading the originals, it is essential to tilt the papyrus this way and that in one's hands, so that the light glances across it; this is because the ink is matt, whereas the background is shiny, and as the light rakes across it the letters glint and thus show up against the dark background. When reading images of the papyri, whether these are made with visible wavelengths of light or with infra-red, the buckling of the surface can produce misleading results; the shapes of some letters are distorted and can even be misread. However, the images are far better in this respect than any that have previously been created. Moreover, the reduction from three dimensions to two means that where, as often happens, different layers of text have stuck together, it is hard to see where the edges are and impossible to tell which layer is above and which is below. These problems could evidently be circumvented by the production of digital movies of the texts.

For me, the advantage of the new images has been three: first, the sheer convenience of having excellent images which can be enhanced and studied away from Naples. This is indispensable for preliminary work and for checking, and even for making models. However, study of the originals remains absolutely essential. Secondly, the images reveal letters which are invisible to the naked eye in certain contexts, and in this they represent a considerable advance over photographs made with visible light. The contexts where new letters are visible seem to be of two kinds. There are places where the papyrus has totally darkened, probably as the result of the glue which was used to attach it to the cardboard backing (*cartoncino*) used in the early 19th century. Secondly, letters become visible where, to the eye, they have been completely washed out by water damage. Such passages are much commoner near the outside of the papyrus-rolls, rather than in the middle. In neither case can the results obtained be confirmed by visual

inspection; but they must be judged reliable, however, because the new cameras do not know Greek and could not be inventing it on their own. The next challenge is, of course, to obtain images of the many, perhaps hundreds, of rolls which have not been opened; one would like to see whether the new advances in medical X-ray tomography like the CT-scan or Nuclear Magnetic Resonance Imaging could be applied to reading the texts from inside the unopened rolls while not causing them any damage.

I can only refer briefly to the other types of progress which have occurred since the fundamental study of G. Cavallo.¹² We have long been familiar with how the papyrus-rolls give the name of the author and the title of his work at the end of the roll. We now know that they also offered the same information at the beginning. As a result of the better reading of the Herculaneum papyri, Delattre has reread a number of titles which we thought had been read definitively, and several scholars have found initial titles as well, and recognised that one was described by Winckelmann when he visited the *Officina dei papiri* in 1765: what he thought was an author's name, ΦΑΝΙΑΣ, must in fact have been the end of the initial title of Philodemus' treatise *Περὶ ὑπερησ φανίας*, *On Arrogance*.¹³ We have at last learned how to recognise the joins between *kolleseis*, the different sheets from which the papyrus-rolls were composed. We have learned that the papyri did not always have a stick (*omphalos* or *umbilicus*) at their centre; quite frequently they were simply rolled upon themselves. Such rolls were oval in section, whereas those with *umbilici* were round.¹⁴ Lastly, we are going to have to face the possibility that all the dimensions which we have so carefully determined for the Herculaneum papyri are wrong: Mario Capasso tells me that experiments conducted on modern papyrus-rolls show that they lose 30% of their bulk when they are carbonised in an oven.

Nor can I do more than mention the more exciting discoveries of the past decade. The Latin papyri have yielded to Knut Kleve

¹² *Libri scritte scribi a Ercolano*, Suppl. 1 to *Cronache Ercolanesi*, Naples 1983.

¹³ For references see *Philodemus, On Poems I*, 18 n. 1.

¹⁴ A. de Jorio, *Officina dei Papiri*, reprinted with introduction by M. Capasso, Naples 1998, 54-5 (first published Naples 1825).

fragments of the *Annales* of Ennius,¹⁵ and the last two acts of a new Roman drama, the *Money-lender* (*Obolostates sive Faenerator*) of Caecilius Statius, a well-known contemporary of Plautus and Terence whose plays have hitherto survived only as small fragments.¹⁶ Kleve also claims to have discovered several book-rolls of Lucretius' *De Rerum Natura*,¹⁷ although this has been disputed. The results for Latin palaeography have also been exciting. Kleve has identified a form of Latin script that is very large and cursive in style, which was replaced by the capitals which we expect during the time of Augustus. If his results are confirmed, they will have very important consequences for the textual criticism of Roman Republican authors.

The gains in Greek texts have been less spectacular but also less open to challenge. We have one new author attested, another Epicurean philosopher, the celebrated Zeno of Sidon. The title has recently been deciphered of a previously unknown work of his.¹⁸ It reads as follows:

Ζήνωνος
Πρὸς τὸ Κρατεροῦ Πρὸς τ[ὸ
Πε]ρὶ τῶν γεωμετρικῶν
ἀποδείξεων
ἀριθ(μός) ΙΧΧΠΔ

This title is of a unique kind: for it means 'In reply to Craterus' work *Against the* «On Geometrical Proofs»: number (of *stichoi*) 2,060'.¹⁹ This is a welcome proof of the presence at Herculaneum of works by Zeno of Sidon, who was of course the teacher not only of Cicero, but of Philodemus as well. Zeno was notoriously polemical; he seems in this case to have written a reply to the reply of a certain Craterus to a work of his own on geometry. Nowadays one can see similar replies, which are often quite polemical, as in the on-line journal the *Bryn Mawr Classical Review*.

¹⁵ 'Ennius in Herculaneum', *Cronache Ercolanesi* 20 (1990) 5-16.

¹⁶ 'How to read an illegible papyrus: Towards an edition of *P. Herc.* 78, Caecilius Statius, *Obolostates sive Faenerator*', *Cronache Ercolanesi* 26 (1996) 5-14.

¹⁷ 'Lucretius in Herculaneum', *Cronache Ercolanesi* 19 (1989) 5-27.

¹⁸ K. Kleve and G. Del Mastro, 'Il *P.Herc.* 1533: Zenone Sidonio A Cratero', *Cronache Ercolanesi* 30 (2000) 149-56.

¹⁹ The stichometric numeral may not be complete.

Among the better known authors, Delattre's new text of Philodemus' *De Musica* will, once it is published, be of tremendous importance in several ways. Firstly, like Obbink's reconstruction of the *De Pietate*, it has provided an example of how to reconstruct an ancient book from Herculaneum. But its content is remarkable too. Philodemus provides a long summary, in over fifty columns, of a work on music by Diogenes of Babylon, who succeeded Chrysippus as head of the Stoa. Having so detailed a summary is almost as good as having the work itself; previously we had no complete work of Diogenes of Babylon, yet he was clearly a major target of Philodemus' polemics. Philodemus then rebuts the work at great length. From the rebuttal Delattre has deduced the significance of Philodemus' aesthetic stance, which is also reflected in his *On poems*. Philodemus intended to win over a Roman audience by presenting the Epicurean approach as being just as cultured as that of his opponents, and by demonstrating that the Stoics were not necessarily the philosophic school closest to the traditional Roman outlook, as Cicero, for example, felt them to be.²⁰ Philodemus' own excellence and productivity as a poet of Greek epigrams has been confirmed by Oxyrhynchus papyrus 3724; this consists of *incipits* of many of his poems. His poetic oeuvre, now the object of a fine study by D. Sider,²¹ was a further proof that an Epicurean could belong to the sort of brilliant cultural milieu that Roman statesmen such as Piso, Caesar and Cassius appreciated. We can now better understand how the Epicureans succeeded in attracting a number of important Roman adherents in the 40s B.C. Thus Philodemus not only dedicated some of his works to Horace's friends Varius, Varus, Plotius Tucca and Vergil,²² but he also dedicated one of the books of his *Rhetoric* to C. Vibius Pansa Caetronianus, the Epicurean consul who perished with Hirtius before Mutina in 43 B.C.²³

²⁰ See his articles 'Vers un premier bilan des conceptions esthétiques de l'épicurien Philodème de Gadara', and 'Vers une reconstruction de l'esthétique musicale de Philodème (à partir du livre IV des *Commentaires sur la musique*)', pp. 237-40 and 371-84 in Auvray-Assayas and Delattre (sup. cit.).

²¹ *The Epigrams of Philodemus*, New York and Oxford 1997.

²² M. Gigante and M. Capasso, 'Il ritorno di Virgilio a Ercolano', *SIFC* 7 (1989) 3-6.

²³ This was shown by T. Dorandi, 'Gaio bambino', *ZPE* 111 (1996) 41-2.

My own next contribution to this field will be to finish editing Books III and IV of Philodemus' *On Poems*. The roll which contained what is thought to have been Book III is in a sad state. At one point the opponent may be Crates of Mallos or another advocate of euphony, and at another point I have found a hitherto unknown line of tragedy, but the remains are very disappointing and hard to interpret. On the other hand, Book IV, which is contained in Herculeum papyrus 207, is much more exciting, even though with the technology presently available one can edit from it only 24 fragments and 16 reasonably complete columns. The lower part of each column is lost; perhaps these parts may one day be found among the unopened rolls. In studying it I have benefitted greatly from the new infra-red images and from repeated study of the original through the new microscopes; I have also been helped by the notes left to me by the late Cecilia Mangoni, who worked on this text in Naples before her tragically early death in 1994.

Book IV contained Philodemus' discussion of genre and of what makes poetry an art (*techne*), but here I can give only a small sample of its contents. The ten best-preserved columns of Book IV were first studied by Theodor Gomperz, who suggested that it contained a rebuttal of Aristotle's *Poetics*.²⁴ This part of the text was restudied by Francesco Sbordone, who argued that Aristotle was indeed the target, but that the *Poetics* was not attacked; instead, the work of Aristotle involved was the lost dialogue *On Poets*.²⁵ In 1991 I reedited these columns, supporting Sbordone's case with evidence from other sources that the *On Poets* had presented much of Aristotle's poetic theory as we know it from the *Poetics*.²⁶ However, I found no conclusive proof that Philodemus' opponent was Aristotle; Philodemus rarely names his adversaries after he has first introduced them.

Book IV has been identified from its final title. It was opened in 1802, using one of the machines designed by Father Piaggio. It is written in a hand influenced by Roman rustic capitals. The

²⁴ 'Die herculanischen Rollen I', *ZOeG* 16 (1865) 717-26.

²⁵ 'Il quarto libro del Περὶ ποιημάτων di Filodemo', *Ricerche sui papiri ercolanesi* I, Naples 1969, 287-372.

²⁶ 'Philodemus' *On Poems* and Aristotle's *On Poets*', *Cronache ercolanesi* 21 (1991) 5-64.

papyrus was mounted in ten frames (*cornici*). The *cornici* were misnumbered, but I have been able to reestablish their original order by measuring the circumferences of the fragments, which diminish towards the middle. Unfortunately, although the outer layers of the *volumen* were sticking together horribly, the unrolling continued, with the result that six of the ten *cornici*, that is three fifths of the text, was completely ruined; these parts consist of a jumble of tiny fragments from different layers, which no technique that I can imagine is ever likely to restore. Among these are a few legible scraps. The first three *cornici* mention flute-playing, a paean, satyrs, playful mockery, and education. In the new fr. 10, I have read the name of Democritus and a reference in the next line to 'images':

2 - - - .]ν Δημόκ[ριτον - - -
 - - - εἰ]δωλα τ[- -
 - - -]σταμεν[- - -
 5 - - -]σικ[- - -

Perhaps there was a discussion of the role of inspiration in poetry, in which Democritus believed, just as he thought that our belief in gods derives from long-lasting *eidola* which appear in prophetic dreams.²⁷ Near the end of this damaged section there is a discussion of whether *mimesis* is the particularity (ἴδιον) of poetry or also belongs to prose; this is the first of the many links between Book IV and Aristotle, who argued in *Poetics* ch. 1 that poetry is a form of *mimesis*. Moreover the new fr. 23 evidently discussed how Euripides and Xenophanes depicted the gods; it also mentions Archilochus, but is too damaged to yield continuous sense:

4 - - - .]ν ὥς[- - -
 5 - - - .]αι θεο[- - -
 - - - (.) Εὐρι]πίδου[- - -
 - - - .]καὶ πα[- - -
 - - - .]Ξε]νοφάν[- - -
 - - - .]ων μαλ[- - -
 10 - - - .]ν Ἀρχίλοχ[ον - - -
 - - - .]τος μη[- - -
 12 - - - .]σαγο[- - -

²⁷ Frr. A 74, 77, 136 Diels-Kranz.

me before she died; the new microscopes and infra-red images confirm her reading]ν Ἀριστοτ[έλην in line 9.

The following column is that previously known as col. i. Here the adversary, whom we can now confidently identify as Aristotle, is arguing that *mimesis* is essential to the definition of tragedy, which is a *mimesis* of people in action (*prattontes*); the *mimesis* does not arise from the spectacle or the speeches, which are there with a view to the people in action. A full presentation of the improved text cannot be offered here, but the text seems to say something like:

- γεγρα-] ||
- 1 φέναι τὸ “μίμησ[ι]ν κείσθαι [τῆι
 — ποιητικῆι”. τ[ὸ δ’ ἴδ]ιον [οὐ “πᾶ-
 σα μίμη[σ]ις” ἀκο]ύσεται, οὐ-
 δ’ ὑπ[ο]μνήσει] πᾶς τοῦ κεί[σθαι
- 5 τή[ν]δε καὶ] περὶ ποιημα[τι]-
 — κῆς [φ]ημὶ δὲ μηδ’ “ὧν ἔσ[τιν]
 ἐκ[ά]στη μίμησ[ις], ἅπ[α]ντα
 ταῦτ’ εἰς <τοὺς> π[ρ]άττοντας” [τ]ὰ[ς]
 γὰρ πρ[ό]ξεις ἀπ[ε]ργάζονται
- 10 πρ[α]ττόντων [κ]ατὰ π[ο]λ-
 λού[ς] λόγους “οὐκ ἀπ[ὸ] τῆς
 ὄψ[ε]ως ἔργα[σί]ας,” φησί[ν], “ἀλ-
 — [λὰ] δ[ι]ὰ λόγων”. καὶ πλεί-
 ον[ε]ς δ’ [αὐ]τὸ παρενόη[σαν].
- 15 τὸ [δ]’ “ἅπαντα ταῦτ’ εἰς τοὺς
 π[ρ]ά[τ]τοντας” ἰδίως ἐστίν
 ἄρ’ [ἅ]π[α]ξ τοῦ διαλεγομέ-
 νου [καί] διδόντος ἀφορ-
 μ[ὴν καὶ] αἰτίαν

«(Aristotle is wrong) to have written that ‘mimesis has been posited for (the art of) poetry’. But the particularity (of poetry) will not be understood as ‘every (kind of) mimesis’, and nobody will make mention of his (claim) that this has been posited regarding the art of poetics too. I also deny his (claim) that ‘whatever things each mimesis is of, they are all with a view to those who are acting’; for (poets) render the actions of people acting for many reasons, ‘not by means of the function of spectacle’, he says, ‘but through words’. The majority (of the critics) misunderstood it (sc. the particularity). But his (claim) ‘all these things are with a view to those who are acting’ particularly belongs, it seems, just to him arguing and giving a starting-point . . .»

Let me conclude by saying something about the nature of the library found in the Villa dei Papiri. The best account of it is that by Mario Capasso.³⁰ The records of the excavation show that papyri were found in a number of different places in the villa. Some Latin papyri were found in the tablinum in piles in a cupboard (*armario*), which has been reconstructed; others were found scattered on the floor of the same room. In the colonnade 101 papyri were found in three carrying-boxes, which have also been reconstructed. Francesca Longo Auricchio and Mario Capasso have suggested that people were trying to rescue at least some of the books when the Villa was overwhelmed by the pyroclastic flow from Vesuvius.³¹ However, the largest number of rolls, 840 in total, were in a small room where they were kept piled on shelves like those shown in a Roman relief, found at Neumagen in Germany but since lost;³² a further book-stack was in the middle of the room. The room, which was rediscovered in February of 1990, was apparently furnished with miniature portrait-busts like the one of Epicurus, which was found in the Villa. Such decoration was typical of an ancient library. But, like all libraries until the reign of Augustus, the library consisted only of a store-room; one could not work in there, but would have taken the books outside, to the colonnade or the tablinum.

In terms of the contents of this library, I agree with the recent conclusion of Horst Blanck that they were not typical of ancient libraries in general.³³ We have only a limited number of non-philosophical texts, which may well come from the cupboard in the tablinum and other stray finds. The great majority of the texts are philosophical. Hayter already observed in 1811 that all the Greek manuscripts are blacker than the Latin ones, and that those of Philodemus are the blackest of all. He inferred that the papyri of different colour must have been found in different rooms, which were affected to different degrees by the heat of the volcanic matter.³⁴

³⁰ *Manuale di papirologia ercolanese*, Galatina 1991.

³¹ F. Longo Auricchio and M. Capasso, 'I rotoli della Villa ercolanese: dislocazione e ritrovamento', *Cronache Ercolanesi* 17 (1987) 37-47.

³² See H. Blanck, *Das Buch in der Antike*, Munich 1992, Abb. 90.

³³ *Ibid.* 158-60.

³⁴ J. Hayter, *A Report on the Herculaneum Manuscripts in a Second Letter addressed, by Permission, to His Royal Highness the Prince Regent*, London, 1811, 47.

This is surely correct; perhaps the papyri of Philodemus were closest to the door of the library. There are no works by authors later than Philodemus, and very many works by Philodemus himself, including at least one draft (I refer to *P. Herc.* 1021, which is a draft of his *History of the Academy*). Accordingly, one must conclude that the library store-room contained the personal working books of Philodemus himself. The collection is much too limited in content to have been the library of a great Roman grandee like the plutocrat Lucullus or Philodemus' patron C. Calpurnius Piso; where are writings of the great poets, orators, legal experts and historians who were indispensable reading for such men?

For a theory about the origins of Philodemus' own book-collection we depend on the work of Cavallo on the palaeography of the manuscripts from the Villa. His study has proved to be of fundamental importance for the reconstruction of complete book-rolls such as the *De Musica*, and will lead to the reconstruction of many more if only people have the courage to undertake it. It seems natural to expect that the earliest rolls would be those which contain the writings of Epicurus, and the latest those which contain the treatises of Philodemus himself. Some of the rolls of Epicurus are certainly so old that they were probably written during the lifetime of the Master himself. I refer above all to *P. Herc.* 1413 of the *Peri physeos*, which is, I think, the oldest Herculaneum papyrus I have seen.³⁵ Notice how it still uses the epigraphic form of Ω , which is replaced by the rounded form ω in all papyri from about 260 B.C. onwards and never returns. The epigraphic form of omega is seen in such famous early papyri as the Orphic Derveni papyrus,³⁶ or that of Timotheus from Abusir in Egypt;³⁷ although forms deriving from this epigraphic omega found among the earlier of the Hibeh papyri of the third century B.C., I do not know of any other manuscript from Herculaneum in which it appears. Other papyri of Epicurus' *Peri physeos*, however, exhibit a startling feature whose significance has not been explained. This is the contrast

³⁵ See Cavallo, *Libri scritte scribi a Ercolano*, Tav. V.

³⁶ For an illustration see E.G. Turner, *Greek Manuscripts of the Ancient World*, rev. ed. P.J. Parsons, London 1987, Pl. 51.

³⁷ P. Berol. 9875, illustrated in I. Gallo, *Greek and Latin Papyrology*, London 1986, Pl. 1.

between broad and narrow letters in the letters epsilon, theta, omicron and sigma ($\epsilon\theta\sigma$). This distinctive style seems not to appear in Egypt until the second century A.D., but at Herculaneum it even appears in some of the papyri of Epicurus. The contrast appears, for instance, in papyri *P. Herc.* 1191 or 1148 and both hands of 1056 of the *Peri physeos*.³⁸ It also appears in the manuscripts both of Demetrius of Laconia, the Epicurean who was active in about 100 B.C., e.g. papyri 1013 and 1014,³⁹ and in one case in a manuscript of Philodemus, that of *On Poems* Book II, *P. Herc.* 994/1676.⁴⁰ It is instructive to compare this manuscript of Philodemus with the hand of one of the manuscripts of Epicurus' *Peri physeos*, *PHerc.* 1497/1417.⁴¹ The similarity is very great. Unless this contrast in letter-width in the letters $\epsilon\theta\sigma$ was established outside Egypt far earlier than it reached that country, one wonders whether it is possible that the manuscripts with this contrast date from the end of the second century B.C. down to the time of the earliest manuscripts of Philodemus himself. It does not seem beyond the bounds of possibility that Philodemus and his students used copies of Epicurus' *On Nature* which had been made only recently, as well as very old ones.

The argument which I have advanced in this lecture gives us good reason to hope that many more texts, perhaps counted in hundreds or even thousands, may be discovered at Herculaneum, if only the excavation of the Villa of the Papyri, halted in 1998, can be resumed. As we have seen, the main collection of books found in the 18th century was probably gathered for Philodemus' personal use. A Roman grandee like Piso would certainly have had a much larger and more diverse collection of books than this. Whether or not Piso owned the Villa in Philodemus' time, as seems to me very likely, I think it improbable that his heirs or the subsequent purchasers of the property would have disposed of the main library while they left Philodemus' specialised collection on the premises. It surely follows that there are many more rolls of

³⁸ See Cavallo, *Libri scritte scribi a Ercolano*, Tavv. II, XII and IV respectively.

³⁹ See Cavallo, *Libri scritte scribi a Ercolano*, Tavv. VI and VII.

⁴⁰ See Cavallo, *Libri scritte scribi a Ercolano*, Tav. XVI, also in Turner and Parsons (sup.), Pl. 78.

⁴¹ See Cavallo, *Libri scritte scribi a Ercolano*, Tav. I.

carbonised papyrus waiting to be rediscovered close by—perhaps thousands. We know that, during the Roman Empire, relatively obscure individuals like the grammarian Epaphroditus and the otherwise unknown poet Serenus Sammonicus owned, respectively, 30,000 and 62,000 rolls.⁴² Philodemus' collection was not on this scale, but Piso's could easily have been. Thus I suspect that there is an as yet undiscovered major library of Greek and Roman literature there: such a library would be completely in keeping with the architectural and cultural distinction of the Villa of the Papyri. The beautiful J. Paul Getty Museum at Malibu in California is a fairly faithful reconstruction of the building. The recent excavations at the Villa by Antonio De Simone had revealed that, during the 18th century, only one level of it was entered. We now know that there were several other such levels, on terraces sloping down to the ancient shoreline.⁴³ Since the papyri were found at a number of locations, some of them scattered about and others in carrying boxes,⁴⁴ it is clear that finds of further stray books are extremely probable. This is the only location in the ancient world where we know for certain that there was a library buried under conditions which ensured its preservation. The site urgently needs careful conservation and the sensitive completion of the excavations; even if the build-up of water at the site is not harming the papyri, it certainly cannot be beneficial for the frescoes. There is all the more reason, then, for us all to urge that the political obstacles to a swift resumption of the excavations can soon be overcome, and that the necessary resources be devoted to the task.

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⁴² Blanck, *op cit.* 158.

⁴³ A. De Simone, F. Ruffo, M. Tuccinardi and U. Cioffi, 'Ercolano 1992-1997. La Villa dei Papiri e lo scavo della città', *Cronache ercolanesi* 28 (1998) 7-60.

⁴⁴ See F. Longo Auricchio and M. Capasso, *art. cit.*