

Sources for the Philosophy of Archytas

Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King. By Carl Huffman. Cambridge: Cambridge University Press, 2005. Pp. xv + 665. \$175.00 (cloth). ISBN 0521837464.

Monte Ransome Johnson

Although Archytas of Tarentum was one of the most important philosophers of the classical period, he has, like a second-rate scholar, become consigned to the oblivion of footnotes. Awkwardly, these are often footnotes to Pythagoreanism and fifth century philosophy. Yet he wrote and influenced fourth (not fifth) century philosophy; and it is an open question to what extent, or in what sense, and even whether, Archytas was really a Pythagorean.

The source of the difficulties is to be found in the cruel, irrational, and occasionally fraudulent history of textual transmission. According to Huffman, only four genuine fragments of Archytas survive. Paucity of genuine material is a common problem in early Greek philosophy. But there is a further, special problem with Archytas: the number of dubious fragments (or spurious fragments, as they are considered by Huffman) attributed to him in antiquity. While the genuine fragments in Huffman's edition amount to just 73 lines, the standard edition of later Pythagorean material accumulates over 1300 lines under the name 'Archytas' (*The Pythagorean Texts of the Hellenistic Period Collected and Edited* by H. Thesleff [Åbo, 1965] 2-48). As I will argue at the end of this essay, there is hope, although it is *not* inspired by Huffman, that more of the material collected by Thesleff can be counted as evidence of Archytas' thought, or at least cannot be ruled out as paraphrasing his words; they should at any rate be included in a complete edition of his philosophy. Because this material is discussed but not included in Huffman's book, one will still have to consult Thesleff in order to do fundamental research on the philosophy of Archytas. I have provided rough translations solely for the purpose of calling more attention to these passages, which are in themselves very interesting.

Huffman cautiously and humbly writes that he has 'no illusions of having produced that mythical beast, "the definitive edition"' and that he only 'hopes that this edition will provide a reliable basis on which study of Archytas can build and that my interpretation of Archytas' philosophy will stimulate further work' (xii). One might reasonably ask whether a 665 page book including just four genuine fragments is the right ratio, especially since we are talking about a philosopher who made the determination and application of proportions the highest science,

which he called ‘logistic’. It is easy to answer this question in the affirmative, however, after studying Huffman’s work. Walter Burkert in his highly influential *Weisheit und Wissenschaft: Studien zu Pythagoras, Philolaus und Platon* (Nürnberg, 1962), translated by E.L. Minar as *Lore and Science in Ancient Pythagoreanism* (Cambridge, MA, 1972) asserted that in Zeller’s work the Pythagorean ‘material is not only collected, with a completeness scarcely to be surpassed, but sifted with uncommon methodological rigor’ (English translation, 2). Huffman has surpassed the completeness of Zeller, vis-à-vis Archytas at least, and yet manages to rival Zeller in rigor. Huffman already performed a similar service for the only other Pythagorean for which there is substantial evidence, in his *Philolaus of Croton: Pythagorean and Presocratic* (Cambridge, 1993).

Burkert understood and explained the unique problem of Pythagorean philosophy alluded to above: the conjunction of lack of genuine material and a glut of spurious and dubious material. He dealt with this by focusing his study on Philolaus, dealing with Archytas in what, after Huffman’s work, seems almost a cursory way. Huffman’s work has rapidly become the starting point for all serious future work on Philolaus and now Archytas, and perhaps it will become so for the ‘Pythagoreans’ or ‘Pythagoreanism’ in general. He provides us with a solid version of the most important evidence (although the evidence he provides is, as I said, incomplete), masterful translations, and searching examinations of the philosophical and scientific import of all this. The chief strength of Huffman’s method in ancient philosophy is that it involves studying and scrutinizing equally the fifth and fourth century poetic, comedic, historical, and medical sources for relevant parallels and literary contexts, and so he avoids the pitfalls and inadequacies of the method, unfortunately common in much ‘Presocratic philosophy’, that pretends easily to identify and demarcate philosophy from other literary enterprises.

Huffman’s book is organized into three parts. Part 1 contains three introductory essays: ‘life, writings, and reception’ (3-43); ‘the philosophy of Archytas’ (44-90); and ‘the authenticity question’ (91-100). Part 2 presents the four ‘genuine fragments’ (103-252). Part 3 contains ‘genuine testimonia’, on ‘life, writings, and reception’ (255-282); ‘moral philosophy and character’ (283-341); ‘geometry’ (342-401); ‘music’ (402-482); ‘metaphysics’ (483-507); ‘physics’ (508-569); and miscellanea (570-594). There are two appendices, one on ‘spurious writings and testimonia’ (595-618) and another on ‘Archytas’ name’ (619-620). The book is completed by a comprehensive bibliography (621-637); a ‘select index of Greek words and phrases’ (638-640, to my mind, much too selective and needing expansion); and indispensable indices of passages and general subjects (including names).

The words ‘genuine’, ‘spurious’, ‘fragments’, and ‘testimonia’ occur frequently in the book, and determine its organization. As I have suggested, it is an extremely difficult job to determine what is genuine and what is spurious for any Pythagorean philosopher, and a high number of the works that go under the name Archytas are clearly spurious (such as a forged attempt to claim Aristotle’s *Cate-*

gories for the Pythagorean tradition in *Concerning the Whole System or Concerning the Ten Categories* (περὶ τοῦ καθόλου λόγου ἤτοι δέκα κατηγοριῶν) and *On Opposites*, which Iamblichus and Simplicius thought were genuine articles on which Aristotle depended.

What go under the name ‘fragments’ in Huffman’s book are passages from later writers (namely, Porphyry, Stobaeus, and Iamblichus) in which ‘Archytas’ and in some cases a book title are named, and it is fairly clear that what follows is an excerpt, not a paraphrase or interpretation. Huffman rightly includes the contexts of these extracts, and he provides a unique numeration of what he takes to be the actual words of Archytas. But these fragments are then supplemented by other texts from the same and other writers that relate directly to the fragment in question. Huffman proceeds by giving the Greek of each text, with translation, followed by a discussion of the authenticity of the fragment (and the contexts and veracity of the sources), miniature essays on the issues occasioned by the fragments, and ending with a detailed line-by-line commentary on the evidence. For the testimony, we are presented with texts and their translations, sometimes alone, other times followed by mini-essays and commentary.

One complaint I have, which may not be avoidable given the variation in the kinds, qualities, and epochs of evidence, is that the presentation is a bit of a jumble of texts, translations, essays, and commentaries, on both fragments and testimony, with some testimony being directly pertinent to some fragments, and others treated as testimony only. We have essays in Part I of the book, essays on the fragments, and sometimes essays apropos particular pieces of evidence. Interspersed among these are detailed commentaries on certain pieces of evidence. This makes the book somewhat difficult to use. In fact, the book made me continue to wonder whether this distinction between fragments and testimony has not outlived its usefulness. What we have are a bunch of texts of varying value, requiring essays (and in many cases word-by-word commentaries) to explain their context and assess veracity. Huffman writes beautiful notes, which are classic models of concision and information density; e.g., the notes on ῥάβδον (158) and ἄπορον...εὔπορον (195). But sometimes the book suffers from disorganization, as well as a slightly inelegant division of format between essay and comment.

In this case I would prefer either a simple chronological arrangement of the entire evidence base, or a more straightforwardly topical arrangement (life, physics, geometry, etc.), with the various pieces of evidence (including excerpts, testimony, paraphrase, and echoes) grouped by pertinent topic. An example of the chronological arrangement (although only in translation) is D.E. Gershenson and D.A. Greenberg’s *Anaxagoras and the Birth of Physics* (New York, etc., 1964); and of the topical arrangement of fragments is S. Luria’s *Democritea* (Leningrad, 1970). Huffman’s own *Philolaus of Croton* followed more of the topical arrangement, with genuine fragments and testimonia grouped under topics like ‘epistemology’, ‘cosmology’, and ‘astronomy’. In that book he also provided a much more generous selection of ‘spurious or doubtful fragments or

testimonia' (along with commentary).

The Philosophy of Archytas

In the subtitle 'Pythagorean, Philosopher and Mathematician King', the last is a somewhat awkward if not horrific phrase, although it would seem that Archytas did combine his mathematical interests with political interests. Some of the strongest evidence for this is contained in *On Law and Justice* (and translated below), but Huffman considers these spurious and does not include them. So let us assume that Archytas was a 'Mathematician King' and ask about the (only apparently simpler) term 'philosopher' in Huffman's subtitle. Huffman's essay 'the philosophy of Archytas' raises a similar question: would Archytas have considered himself a philosopher, as his contemporary Plato certainly did?

We are told that Pythagoras gave the answer 'philosopher' to Leon the Tyrant's query 'What are you?' (DL viii 8; cf. Cicero, *Tusc.* v 8). The anecdote is just a contribution to the legend of Pythagoras, but if Pythagoras could have been considered a philosopher, then presumably his successor Archytas should be. But this apparently easy answer in turn raises the quite difficult question of whether Archytas should even be considered a Pythagorean. To many it seems obvious that he should, and he has been treated, at least since the Neopythagorean tradition of later antiquity as such. But a much earlier tradition treats Archytas as distinct from the Pythagoreans. Aristotle in fact never calls Archytas a Pythagorean, and titles of his lost works seem to treat Archytas and Pythagoreanism separately. In Diogenes Laertius v 25, we find among the titles of Aristotle's works the following (Huffman, 579-580):

On Nature- 3 books

Physics- 1 book

On the Archytan Philosophy- 3 books

A Summary of the Timaeus and the Works of Archytas- 1 book

A Response to the Writings of Melissus- 1 book

A Response to the Writings of Alcmaeon- 1 book

A Response to the Pythagoreans- 1 book

A Response to the Writings of Gorgias- 1 book

A Response to the Writings of Xenophanes- 1 book

A Response to the Writings of Zeno- 1 book

On the Pythagoreans- 1 book

We can infer a lot from this catalogue. First, Aristotle evidently authorizes the idea of 'the philosophy of Archytas', even in a title of a multi-book work. Second, Archytas is treated separately from the Pythagoreans, and in direct connection with Plato. On the basis of this evidence alone I think it would be right to conclude that Archytas had a philosophy, and that it was sufficiently well developed and available that Aristotle was inclined to dedicate entire works to discussing it. Third, Aristotle wrote a lot about Archytas, perhaps devoting more books to him than to any other individual philosopher. Aristotle's pupil Aristoxenus, who was also from Tarentum, wrote a biography of Archytas, and this is

the source for many of our ancient sources that preserve testimony about the life and thought of the most famous philosopher from Tarentum. Eudemus of Rhodes, another pupil of Aristotle, gave Archytas a prominent place in his influential history of geometry. Thus Archytas was considered a prominent philosopher by some of the most important and influential philosophers of the fourth century, including Plato but especially Aristotle. It is clear, and frequently stressed by Huffman, that Archytas had a great influence on Aristotle and his school (88-89).

And so while I hesitate to read too much into the ‘Pythagorean’ subtitle to Archytas of Tarentum, I am convinced that ‘Philosopher’ applies, along with, perhaps, ‘Mathematician-King’. What then was the philosophy of Archytas? Let us begin to answer that by considering the fragments that Huffman considers genuine.

‘Genuine’ Fragments

Fragment 1 is attested in Porphyry’s *Commentary on Ptolemy’s Harmonics* i 3. Porphyry names Archytas (calling him a ‘Pythagorean’), and a work called *On Mathematics*, and indicates that he is quoting right from the beginning (ἐν τῷ Περὶ μαθηματικῆς εὐθὺς ἐναρχόμενος τοῦ λόγου). It begins:

Those concerned with the sciences seem to me to make distinctions well and it is not at all surprising that they have correct understanding about individual things as they are. For, having made good distinctions concerning the nature of wholes they were likely also to see well how things are in their parts. Indeed concerning the speed of the stars and their risings and settings as well as concerning geometry and numbers and not least concerning music, they handed down to us a clear set of distinctions. For these sciences seem to be akin. (Fr. 1.1-7; 105-106)

As much as I have quoted of this fragment is also attested in Nicomachus’ *Introduction to Arithmetic* i 3.3, although he attributes it to the beginning of a work entitled *Harmonics* (ἀρχόμενος τοῦ ἁρμονικοῦ). Porphyry continues to quote for about 35 more lines in the edition of Huffmann, giving a detailed account of the nature of sound. The account of sound should be supplemented by a substantial report from Theon of Smyrna’s *Mathematics Useful for Reading Plato*, but one has to wait for this until the testimony on Archytas’ musical theory (470-478; an example of the inconvenience of the arrangement that results from the separation of ‘fragments’ and ‘testimonia’).

Fragment 2, like Fragment 1, is preserved in Porphyry’s *Commentary on Ptolemy’s Harmonics* (i 5). Porphyry tells us that Archytas in a work *On Music* (Περὶ μουσικῆς) wrote that:

There are three means in music: one is the arithmetic, the second geometric and the third sub-contrary [, which they call ‘harmonic’]. The mean is arithmetic, whenever three terms are

in proportion by exceeding one another in the following way: by that which the first exceeds the second, by this the second exceeds the third. And in this proportion it turns out that the interval of the greater terms is smaller and that of the smaller greater. The mean is geometric, whenever they [the terms] are such that as the first is to the second so the second is to the third. Of these [terms] the greater and the lesser make up an equal interval. The mean is subcontrary, which we call harmonic, whenever they [the terms] are such that, by which part of itself the first term exceeds the second, by this part of the third the middle exceeds the third. It turns out that, in this proportion, the interval of the greater terms is greater and that of the lesser is less. (Fr. 2; 162-163)

These distinctions are central to Archytas' philosophy, and capture the central insight of logistic. The same account of the means is repeated in *On Law and Justice* Fragment 3, where they are used to explain the distributional principles of the aristocratic, democratic, and oligarchic political orders. In his commentary on the 'genuine' Fragment 2, Huffman refers to '*On Law and Justice*, whose authority is doubtful' (166), although he does not include a text or translation of the relevant fragment, because he considers the work not dubious but spurious. One of his major reasons for rejecting that work is its failure to connect with genuine fragments. But it would certainly be appropriate for the 'Mathematician King' to employ his science of logistic in the context of economic distribution, exactly as he suggests in 'genuine' fragment 3.

Fragment 3 is preserved by both Stobaeus and Iamblichus, and runs about 14 lines in Huffman's edition. We are told that 'Archytas says the following things in the *Περὶ μαθηματικῶν*':

For it is necessary to come to know those things which you did not know, either by learning them from another or by discovering yourself. Learning is from another and belongs to another, while discovery is through oneself and belongs to oneself. Discovery, while not seeking, is difficult and infrequent but, while seeking, easy and frequent, but, if one does not know <how to calculate>, it is impossible to seek. Once calculation was discovered, it stopped discord and increased concord. For people do not want more than their fair share, and equality exists, once this has come into being. For by means of calculation we will seek reconciliation in our dealings with others. Through this, then, the poor receive from the powerful, and the wealthy give to the needy, both in the confidence that they will have what is fair on account of this. It serves as a standard and a hindrance to the unjust. It stops those who know how to calculate, before they commit injustice, persuading them that they will not be able to go undetected, whenever they appeal to it [sc. as a stan-

dard]. It hinders those who do not know how to calculate from committing injustice, having revealed them as unjust by means of it [i.e., calculation]. (Fr. 3; 183)

This fragment is presented with a text and critical apparatus. It is a crucial piece of evidence for Archytas' philosophy, and Huffman does a capable job of unpacking it. We have an essay on the authenticity of the fragment (183-184), a discussion of the context of the sources (184-185), a discussion of whether the fragment should be considered two fragments (186-187), a discussion of what book of Archytas the fragment may have come from (187-188), an essay on the importance of the fragment (188-193), and a detailed commentary (193-224). It is not until five pages into the detailed commentary that we have a mention of the *Meno* problem. Huffman convincingly shows that 'Archytas is solving Meno's paradox (how can we seek something we do not know?)' (197).

The political application of calculation to economic distribution is discussed at much greater length in *On Law* Fragments 2-4, where the means defined in 'genuine' Fragment 2 are applied to this. In this way the fragments tie together nicely, but Huffman treats the *On Law* as spurious and so does not avail himself of this source of information on the methods of the Mathematician King.

Finally, Fragment 4 is quite short, and attested in only one source, Stobaeus (I, Proem 4), who names Archytas and the work *Diatribes* (Διατριβῶν). As with the last fragment, I quote Huffman's entire translation.

Logistic (λογιστικῶς) seems to be far superior indeed to the other arts in regard to wisdom and in particular to deal with what it wishes more concretely (clearly) than geometry. Again, in those respects in which geometry is deficient, logistic puts demonstration into effect (completes proofs) and equally, if there is any investigation of shapes, [logistic puts demonstrations into effect (completes proofs)] with respect to what concerns shape as well. (Fr. 4; 225)

Huffman dissects and analyzes these four fragments for almost 150 pages, and he consistently brings considerable insight to them. In their informative reviews of the book, Andrew Barker (*Oxford Studies in Ancient Philosophy* [2006] 31: 297-321) and Sylvia Berryman (*Rhizai* [2006] 3: 179-182) have focused on the four genuine fragments, and the reader may be referred to them for a more extensive treatment. The vast bulk of Huffman's book (over 300 pages) is devoted to the 'genuine testimony', but I will have to give an overly brief outline of these as well.

Writings and Titles

Unfortunately, no list of Archytas' writings survives, but according to Huffman 'we have evidence for something like five or six treatises by Archytas' (31). He goes on to list the following five:

1. *Harmonics*. According to Huffman, a work with such a name was probably the source for our fragments 1 and 2, preserved primarily in Porphyry.

2. *On Sciences*. According to Huffman, a work with such a name was probably the source of our fragment 3, preserved by Iamblichus and Stobaeus.

3. *Discourses*. This work was probably the source for our fragment 4, preserved by Stobaeus. Huffman speculates that ‘it may have focused on ethical issues and the application of mathematics to such issues’.

4. There is some evidence, besides the prima facie likelihood, that Archytas composed a cosmogony or cosmology along the lines of the fifth century *On Nature* literature.

5. Huffman believes that ‘a work on definitions’ lies behind some remarks of Aristotle (31), but there is vanishingly little evidence for this.

I find Huffman’s treatment of the titles (30-32, 126, 167-168, 187-188, 228-232) confusing. He translates *Περὶ μαθηματικῆς* as *On Mathematics*, but *Περὶ μαθηματικῶν* as *On Things Scientific*; surely the translations should make apparent that the terms are cognate, if not confused derivatives of some kind. His case for making *Harmonics* the title for a single work that included both Fragments 1 and 2 is based on the subject matter of the fragments, not ancient authorities. There is no reason, so far as I can tell, to assume that the subject of the entire work was the subject of the meager fragments that have survived. Nicomachus’ reference to ἀρχόμενος τοῦ ἁρμονικοῦ could refer to a section or part dealing with harmonics of the *Περὶ μαθηματικῆς* or *Περὶ μαθηματικῶν* (if these were actually one work), and perhaps the account of harmonics was copied out as a separate work. Although Empedocles probably wrote only one work, parts of it became known as separate poems, *Περὶ Φύσεως* and *οἱ Καθαρμοὶ* (DL viii 77); similarly parts of Parmenides’ poem *Περὶ Φύσεως* (DL viii 55) have become known as *Alētheia* and *Doxa*.

To Huffman’s list of works I would add, at least provisionally and for the sake of keeping them alive in the face of Huffman’s skepticism about their authenticity:

6. *On Wisdom* (*περὶ σοφίας*). This work and its author are named along with five fragments by Iamblichus. It is disqualified by Huffman largely on the grounds that similar ideas can be found in Aristotle. Although some works of Aristotle were copied and attributed to Archytas, this one is not identical to any work of Aristotle. That it contains ideas similar to Aristotle is probably due to the nature of current philosophical debates and anyway should come as no surprise after Huffman’s proof that Archytas had a major influence on Aristotle.

7. *On Law and Justice* (*περὶ νόμου καὶ δικαιοσύνης*). Five fragments of this work have been preserved by Stobaeus. Huffman’s reasons for rejecting this work are first ‘the connections it shows with surely spurious Pythagorean treatises’ (but this could be because the forgers were using a genuine treatise of Archytas); and second ‘its failure to connect with the genuine fragments and testimonia of Archytas which deal with ethical and political issues’. Again, I think that the *On Law* Fragments 2-4 dealing with how a ‘logistical’ science of proportionality could inform the politics of economic distribution do connect with ‘genuine’ Fragments 1-3, and are entirely plausible as fragmentary remains of an

ancient ‘Mathematician-King’.

Life

Huffman estimates that Archytas was born between 435 and 410 and died between 360 and 350 (5), and thus his productive life falls in the first half of the fourth century. He was a citizen of Tarentum, a city located near the heel of Italy, founded by Spartan colonists in the late eighth century and frequently at war with local native peoples.

According to Dicaearchus, Tarentum may have had a Pythagorean community already by 509 when Pythagoras supposedly took refuge there in his flight from Croton (6). Although nothing of his teachers can be known with certainty, it is possible that Archytas may have been a student of the Pythagorean Philolaus, for he was evidently influenced by him. Huffman goes so far as to suggest that ‘Archytas did not present a new account of the basic principles and structure of the cosmos but adopted those of Philolaus and instead directed his attention to using the sciences in order to work out that cosmos in detail’ (85). Philolaus said that: ‘indeed all the things that are known have number. For it is not possible that anything whatsoever be understood or known without this’ (Fr. 4, trans. Huffman, *Philolaus of Croton*, 172). Philolaus’ application of numbers to natural things involved identifying concepts and numbers, e.g., justice = 4 (66; but compare *Philolaus of Croton*, 59-64, which presents a much different account of Philolaus’ theory of numbers; for a critical take on Huffman’s earlier account, see P.M. Kingsley, ‘Philolaus’, *Classical Review* [1994] 44: 294-296).

Walter Burkert sees in such number symbolism ‘again and again a spirit and method directly opposite to that of exact mathematics, so that the latter cannot have arisen from the activities of the Pythagoreans’ (*Lore and Science*, 480). But Archytas who, again, may or may not have been a ‘Pythagorean’, developed the mathematical sciences of harmonics and stereometry by applying the science of ratio and proportion, which he called ‘logistic’. This of course allowed a much deeper and truer account of mathematical phenomena, and quite possibly has interesting political applications. Perhaps the best way to put it, then, is that Archytas’ philosophy ‘was both based on and radically transformed an all-encompassing view of the cosmos and the place of humanity in it, which he inherited from his predecessor Philolaus’ (46).

Archytas may have been a teacher of Eudoxus (c. 390-340, if the testimony of DL (viii 86) is to be believed. Eudoxus, besides his mathematical model of the universe (adopted in a modified form by Aristotle in *Metaphysics* xii), developed a general theory of proportion (essentially contained in book 5 of Euclid’s *Elements*), and some of his interests may very well have been stimulated by Archytas (6-7; 477-478).

According to DL (viii 79), who was probably following Aristoxenus, Archytas was elected general (*stratēgos*) seven times, and Huffman plausibly suggests that this afforded him not just military power but political authority as well, as at Athens, where generals could make proposals to the council and convene the

assembly. We are also told by the author of the Archytas entry in the *Suda* that he ‘was the leader of the Italian league and was chosen general *autokratōr* by the citizens and the Greeks in that region’ (13). In truth we have little idea of what this means, but Huffman resourcefully compares similar arrangements elsewhere and concludes that Archytas will have had special diplomatic and military authority, though not ‘autocratic’ power in the modern sense.

In this connection, Huffman asserts that ‘the best evidence suggests that Tarentum was a democracy for the entire time that Archytas was active in the city’ (17). Indeed, Aristotle tells of a democratic revolution in Tarentum that occurred after many nobles were slain; Diodorus furnishes a date of 473 (17; Aristotle, *Politics* 1303a). Aristotle also praises Tarentum with these words:

The example of the people of Tarentum is also well deserving of imitation, for by sharing the use of their own property with the poor, they gain their good will. Moreover, they divide all their offices into two classes, some of them being elected by vote, the others by lot; the latter, so that the people may participate in them, and the former so that the state may be better administered. (Aristotle, *Politics* 1320b, trans. Jowett)

Huffman points out that the use of the present tense here may indicate policies enacted by Archytas; at any rate they fit nicely with the suggestions of Fragment 3, as well as Fragments 2 to 4 of *On Law and Justice* (see below).

The most intriguing and problematic aspect of Archytas’ biography is his relationship with Plato. We may disregard immediately both of the conflicting suggestions of the doxographers that make one a dominant influence over the other, and embrace Huffman’s conclusion that ‘Archytas and Plato were guest-friends and civil but competitive colleagues in the world of ancient science and philosophy; neither was the master of the other’ (42). A crucial piece of evidence is the dubious seventh letter of Plato, which has been recently studied for clues about Archytas by G.E.R. Lloyd in ‘Plato and Archytas in the seventh letter’, *Phronesis* (1990) 35: 159-174. The letter describes Plato’s travels to Italy and Sicily shortly after the death of Socrates, and Plato’s involvement with Syracuse and its politics. According to Huffman’s interpretation, the letter presents Plato and Archytas as having a guest-friendship relationship, which does not necessarily indicate intimate ties. Plato appealed to this ‘friendship of utility’ when he felt threatened in Syracuse, and Archytas apparently obliged by sending an embassy to lobby for Plato’s release and a ship to rescue him. Huffman endorses Lloyd’s reading of the letter as indicating no high regard for the philosophy of Archytas by its author.

Huffman assiduously looks beyond the letter for information about their philosophical relationship, asserting that ‘if we want to know why Plato went to visit Archytas in Tarentum and what his attitude to Archytas was, the answers are found in Book VII of the *Republic*, which was written sometime in the 370s, and...these answers suggest a way in which the two strands of the later tradition about Archytas and Plato can be connected’ (41). Huffman (109) sees in the fol-

lowing passage an allusion to Archytas' Fragment 1:

It is likely, I said, that as the eyes have been made for astronomy, so the ears have been made for musical motion, and these sciences are some kin of one another, as the Pythagoreans say and we, O Glaucon, agree. Or do we? Yes we do, he said.
(Plato, *Republic* 530d)

Huffman's idea is that Plato befriended Archytas, not because he was looking for a new master to replace Socrates, but because he was interested in mathematics, and Archytas was 'one of the leading authorities on *mathēmata*'. Their relationship was established around 388/7, and they helped one another: Plato connected Archytas with the geopolitically powerful Dionysius II, and Archytas later came to Plato's aid at Syracuse. But Plato had serious doubts about Archytas' philosophy of mathematics because of its focus on perceptible things, like the sounds played by practicing musicians, and or the visible rays of optical phenomena. Plato will have agreed that 'logistic' is a crucial science, but not because it allows us to account for perceptible things, rather because it turns us away from them. Archytas on the other hand saw the value of 'logistic' to lie in the fact that it deals 'more concretely' (as Huffman translates ἐναργεστέρω) with the phenomena than any other science. (Another translation would be 'more perspicuously', which I prefer because it evinces the ocular connotation of the root.) Thus 'Archytas appears to be locating wisdom in the exact opposite realm from Plato; wisdom has to do not with the intelligible and invisible but with the visible and palpable' (71).

Moral Philosophy and Character

We have several pieces of information about Archytas' 'moral philosophy and character'. Many of these are anecdotal reports about Archytas' control of anger. The best attested is the report about Archytas and the Pythagoreans refraining from punishment in anger, waiting until their reason had returned (Iamblichus, *On the Pythagorean Life* 197-198, supplemented by eight other bits of information). Aelian (XIV.19) tells us that once when he was forced to say something unseemly, Archytas 'instead of speaking it, wrote it down on the wall' (337). This may be the most ancient rationale for graffiti, which to this day is a common, significant, and controversial form of political catharsis.

There is an uncorroborated report in Cicero's *Laelius* (xxiii 88) about Archytas' opinion that friendship is indispensable for humans (293-297). Consider someone ascending to the heavens and observing the universe and the stars: could they enjoy even this if they had no one to share it with? Certainly no human, even provided with every necessity, could be happy or consider themselves successful if totally deprived of human society. The only thing more insufferable than the hell of 'other people' is the hell of 'no people'. One wonders if even the gods could handle such a thing: an interesting question for both Aristotle's and Epicurus' notions of utterly disinterested, antisocial, and yet intelligent, gods.

Two pieces of evidence indicate that Archytas enjoyed children (297-301), no doubt rare for a philosopher and worth wondering about; it remains unclear what to make of Aristotle's report in the *Politics* that Archytas designed some kind of (mechanical?) device, a 'clapper' or rattle in order to keep children occupied (302-307).

The next source of evidence for Archytas' moral philosophy and character is Athenaeus' *Sophists at Dinner* (xii 545a), which quotes Aristoxenus (Fr. 50, Wehrli) in his *Life of Archytas*. Aristoxenus presents a dialogue between Archytas and Polyarchus of Syracuse (the only reference to the latter in extant Greek literature) on the occasion of Polyarchus' visit to Tarentum as an ambassador of Dionysius the Younger. Polyarchus defends bodily pleasures as a more natural and sensible pursuit than virtues, appealing to the enviable luxuries of the Great King of Persia and Greek tyrants. Huffman provides a neat philosophical commentary on the substantial speech along with critical text and translation (307-322), and raises some questions about the nature of Pythagorean teaching occasioned by Aristoxenus' description of the setting and procedures of the conversation between Archytas and Polyarchus. Aristoxenus was a native of Tarentum and in a good position to know what kind of philosophical discussions Archytas engaged in, although a skeptic could argue that he is imposing Academic models of discourse on his subjects. Archytas' reply to Polyarchus is in some form preserved in Cicero's *Cato the Older on Old Age* (12.39-41); Cicero's source is most likely Aristoxenus as well, although he obviously modified Archytas' speech more than Athenaeus did Polyarchus'. What shines through the murky legacy of textual preservation, carefully sifted by Huffman (323-337) is Archytas' argument that pleasure is inconsistent with reason. We are asked to consider this in a titillating way: engage in a maximally pleasurable activity but try to use reason at the same time. Aristotle apparently treated himself to the experiment; at any rate he considers the famous 'argument from orgasm' at *EN* 1152b16-18 (333-336).

Geometry and Music

Archytas was a highly regarded geometer in the fourth and third centuries for his solution to the problem of the doubling or duplication of the cube. This was another accomplishment of Archytas' focus on 'logistic' or the science of proportions, and it is also 'likely to be the first solution ever to the problem of finding two mean proportionals in continued proportion between two given lines'. Thus it is one of 'the earliest pieces of solid geometry that we possess' (355). A report of the solution by Eudemus of Rhodes is preserved in Eutocius' *Commentary on Archimedes' On the Sphere and Cylinder* II, and although it was probably modified by one or both of the intermediate sources, Huffman persuasively argues that it is based directly on the work of Archytas. Huffman provides many pieces of important evidence that describe the problem and the motivations for solving it. And Huffman presents, in addition to an abundance of critical texts and translations, an interpretation that is accessible to classicists and philoso-

phers in a way that will allow them to appreciate the mathematical and philosophical issues (342-401). Thus Archytas' solution is especially notable for its extension into the field of stereometry of the kind of mathematical rigor evident in his predecessor Hippocrates of Chios. Huffman ably responds to a report in Plutarch (*Table Talk* viii 2.1 718e) that Plato criticized Archytas' solution to the problem because it depends on practical mechanical instruments. Interestingly, Michael White has recently shown that the 'theoretical' proof attributed to Plato is itself derivative from a 'mechanical' proof ('On doubling the cube: mechanics and conics', *Apeiron* [2006] 39: 201-219). Huffman presents a compelling interpretation of Plato's overall criticism of contemporary mathematics as directed not at its method of proof, but at its focus on the 'logistic' of merely practical concerns (*Rep.* 528a-d).

Archytas was also famous for his musical theory, and Huffman includes eighty pages of material: extensive essays and commentaries on seven pieces of evidence. The most important is from Ptolemy's *Harmonics* i 13-14, which describes in detail how 'Archytas of Tarentum, who engaged in the study of music most of all the Pythagoreans, does attempt to preserve what follows in accord with reason, not only in the concords but also in the divisions of the tetrachord, on the grounds that having an excess that is a common measure is proper to the nature of what is melodic' (404). Two other important pieces of evidence from Porphyry's *Commentary on Ptolemy's Harmonics* follow. Huffman defends Archytas against Boethius' criticism that Archytas' argument that a superparticular ratio (and hence the tone) cannot be divided into equal parts is 'too loose'; he points out that the improved argument contained in Proposition 3 of Euclid's *Sectio Canonis* is derived from Archytas' proof.

The last report I will mention comes from pseudo-Plutarch's *On Music* (1147a): 'Pythagoras, Archytas, Plato and their associates as well as the rest of the ancient philosophers used to say that the motion of the universe and the movement of the stars did not arise and become organized without music. For, they say that all things were arranged by God in accordance with harmony.' One would like to hear more about this cosmological speculation, which has had an intriguing influence if not grip on many great minds, including that of Johannes Kepler in his *Harmony of the Worlds* (1619). Huffman considers it quite probable that Archytas did believe that the universe was arranged according to harmony, and there is evidence in Fragment 1 that he accepted the doctrine of the harmony of the spheres. Unfortunately, there is apparently not much more evidence that could serve as a basis for further speculation, although there is some in Philolaus (Frs. 1 and 6).

'Metaphysics' and Physics

The anachronistic title 'metaphysics' is used as a header for a collection of fragments of Archytas, most of which are concerned with the nature of numbers and their role as causes and principles. Others are about definitions, such as Aristotle's account of a certain kind of definition in *Metaphysics* viii 2 illustrated by

the following: ‘For example, what is windlessness? Stillness in a quantity of air. For the air is the matter, but the stillness is actuality and substance. What is calm-on-the-ocean? Levelness of sea. The sea is what underlies as matter. But the levelness is the actuality and form’ (490). Aristotle is in general critical of Pythagorean definitional practices as being too limited in application, too ‘superficial’ and arbitrary. His special treatment of Archytas, as Huffman argues (491-503), is a striking case of Aristotle treating Archytas distinctly from other Pythagoreans. Unfortunately, the scant evidence can be supplemented only by a repetition of the definitions in the *Metaphysics* in the *Topics* (without naming Archytas) and an extremely brief (possibly joking) reference in the *Rhetoric* to Archytas’ comparison of arbitrators and altars (‘Where do criminals find refuge these days?’).

Huffman constructs an ingenious speculative interpretation of an Archytan theory of definitions, comparing them with Philolaus’ use of limiters and unlimiteds. I much enjoyed this section (for a more skeptical take, see Andrew Barker’s review). But I do not think there is any evidence that Archytas composed a work on definitions, nor that he wrote anything that should be called metaphysics.

Physics is a different story. Simplicius in his *Commentary on Aristotle’s Physics* quotes two passages from Eudemos’ *Physics* (Frs. 60 and 65 Wehrli; 508-515) that preserve some substantial thoughts of Archytas. The first is that Archytas identified the uneven as a cause (but not a definition) of motion. This can be supplemented by a reference in [Aristotle]’s *Problems* (xvi 9) to Archytas saying that the proportion of equality is present in natural motion. The context is a problem about why animals and plants have ‘rounded’ parts; is it because these parts are produced by natural motion, which is curved or ‘bends back on itself’ because it has the proportion of equality in it? Huffman (516-539) is rightly skeptical about the extent to which the context of the problem can be attributed to Archytas, but he is also right to see it as important information on Archytas’ theory of motion, about which we unfortunately have almost nothing else.

The second fragment of Eudemos preserved by Simplicius deals with Archytas’ wonderful thought experiment about the infinitude of the cosmos:

‘But Archytas,’ as Eudemos says, ‘used to propound the argument in this way: ‘If I arrived at the outermost edge of the heaven [that is to say at the fixed heaven], could I extend my hand or staff into what is outside or not?’ It would be paradoxical not to be able to extend it. But if I extend it, what is outside will be either body or place. It doesn’t matter which, as we will learn. So then he will always go forward in the same fashion to the limit that is supposed in each case and will ask the same question, and if there will always be something else to which his staff [extends], it is clear that it is also unlimited. And if it is a body, what was proposed has been demonstrated. If it is place, place is that in which body is or could be, but what is potential must be regarded as really existing in the case of eter-

nal things, and thus there would be unlimited body and space.’

(Eudemus, Fr. 65 Wehrli = Simplicius, *In Ar. Phys.* iii 4; 541)

Simplicius goes on to add some comments, but has apparently preserved the earliest version of this justly famous argument, still commonly used to challenge the thought of keen children. In Lucretius’ version (*DRN* i 968-983) a spear is thrown; Epicurus undoubtedly made the argument himself, and perhaps he learned it from his contemporary Eudemus, if not from a work of Archytas. Huffman provides a lucid elaboration of the fragment (540-550). But why does Huffman consider it a mere piece of testimony and not an official ‘fragment’? As he says: ‘there is no reason to doubt the authenticity of this testimonium. Eudemus is an early and excellent source, who clearly had access to Archytas’ work...and probably to Aristotle’s books on Archytas. The context...is not in accord with the pseudo-Pythagorean literature that seeks to glorify Pythagoreans at the expense of Plato and Aristotle’ (541).

I can see no reason not to consider Simplicius’ *Commentary on Aristotle’s Physics* iii 4 (CAG ix 467.26-468.3) a ‘genuine fragment’ of Archytas (at least lines 1-3 of A24, 540). Perhaps it is a fifth fragment. Or maybe the first?

Apuleius in his *Apology* (15-16) preserves a tiny amount of information about Archytas’ optics, that the visual ray is ‘derived from our eyes alone without any external support’ (551). Apuleius’ source may be Archimedes’ *Catoptrics*, and hence fairly reliable. Other evidence about the Pythagorean’s early interest in optics can be used to support this. Huffman fruitfully compares Archytas’ treatment of sound (as in Fragment 1), which focuses on the mathematical aspects of the phenomena, though not, as Huffman incautiously puts it, on ‘formulating the basic laws governing the behavior of sound...formulating those laws in a mathematical way’ (562). There is of course nothing about ‘laws’ or anything like ‘laws of nature’ in Archytas. Nevertheless, it is probably quite right to claim that, as in the case of harmonics, Archytas’ optics focused on the geometry of the visual ray. In fact, Archytas might be the reason that Aristotle treats optics as a distinct discipline, sub-alternate to geometry as harmonics is to arithmetic (in *Physics* ii 2; this is suggested by Myles Burnyeat in ‘Archytas and Optics’ (*Science in Context* [2005] 18: 35-53).

Miscellaneous Testimonia

Included here is the story about Archytas’ model of a dove specially constructed so as to actually fly, preserved in Aulus Gellius’ *Attic Nights* (x 12.8-10). The existence of extremely complex mechanisms in antiquity, such as the Antikythera mechanism (a late second century device that had at least 30 interlocking gear-wheels and could calculate and display astronomical information such as the phases of the moon and a luni-solar calendar) suggests that there was more to ancient mechanisms than we could have ever imagined (see: T. Freeth et al., ‘Decoding the ancient Greek astronomical calculator known as the Antikythera mechanism’, *Nature* [2006] 444: 587-591). But did Archytas engage in extensive construction of automata, or develop and apply a theory of mechan-

ics for them, as some sources suggest? Although Aristotle refers to ‘self-driven’ models (*MA* 701b2-10; *GA* 734b9-17, 741b7-15, 983a14), the idea of one that could fly, perhaps due to a pneumatic mechanism, seems too advanced for the technology of Archytas’ day.

Gellius gives a sketchy account of Archytas’ ‘dove’ as an automatic mechanism in which ‘a model of a dove, which was made by Archytas out of wood with a special construction in accordance with the discipline of mechanics, flew’ (570). Huffman provides a reconstruction of the dove as an automaton, a modified version of the same kind of thing in Wilhelm Schmidt, ‘Aus der antiken Mechanik’, *Neue Jahrbücher für das Klassische Altertum* (1904) 13: 329-351. Huffman conservatively concludes that the dove was probably just an isolated invention of Archytas, unconnected in any very interesting way with his other work. Sylvia Berryman has recently advanced an even more skeptical, persuasive, and parsimonious interpretation of the evidence in Gellius. Elaborate devices that fall short of automata, such as simple siege devices, are called by the names of animals in Greek—‘tortoise, crow, scorpion, crane’—and so the ‘dove’ could easily be a reference to a ballistic device (‘Ancient automata and mechanical explanation’, *Phronesis* [2003] 48: 344-369 at 355). Archytas was, after all, a *stratēgos* and there are reports about his application of mathematics to mechanical devices of war. A skeptical account of the reports of Archytas’ innovations of military machinery is given by Huffman on pages 14-17, but this has no implications for Berryman’s suggestion that Archytas could have deployed a relatively low-tech war device, probably a projectile, called the ‘dove’, and the later notion that Archytas was a master of automata is not credible, as Huffman himself seems to conclude.

The rest of the chapter on miscellaneous testimonia contains evidence related to Aristotle’s books on Archytas. It is convenient to have this evidence laid out. Huffman plausibly suggests that we should understand τὰ ἐκ τοῦ Τιμαίου καὶ τῶν Ἀρχυτείων not as ‘Excerpts from...’ but rather ‘A Summary of the *Timaieus* and the Writings of Archytas’. According to Andrew Barker (*Oxford Studies in Ancient Philosophy* 31: 319-320), we might have more than just the title of this work in [Plutarch]’s *On Music* chapters 23-25. (If true, this would both augment and specify what appears obscurely as fragment 908 of the ‘Fragmente ohne Buchangabe’ in *Liborum deperditorum fragmenta* ed. O. Gigon = vol. 3 of *Aristotelis Opera* (Berlin, 1987).) The author of *On Music* indicates that he is quoting Aristotle verbatim; Rose thought this to originate in the *Eudemus* (Fr. 47); Ross in *On Philosophy* (Fr. 25). In Ross’ translation, we read:

On the theme that music is something noble, divine, and grand, Aristotle, the pupil of Plato, says: ‘Music is heavenly, by nature divine, beautiful, and inspired; having by nature four parts, it has two means, the arithmetical and the harmonic, and the parts of it, their extents, and their excesses one over another, have numerical and proportional relations; for tunes are arranged in two tetrachords.’ These are his words.

(Plutarch, *Moralia* 1139b, trans. Ross, *Aristotle: Select Fragments* [Oxford, 1952] 95).

The elaboration that continues in *On Music* 23-25 is probably heavily influenced by Aristotle, and Aristotle was in turn probably heavily influenced here by Archytas (compare Huffman's genuine Fragment 2, as well as Fragment 3 of *On Law and Justice*, below). In *On Music* 25 we have a discussion of perception that draws on the *Timaeus* and Pythagorean notions; it is said that sight and hearing are accomplished 'not without harmony'. Barker's suggestion that the source is Aristotle's book on the *Timaeus* and Archytas is persuasive and shows that, unsurprisingly, there still may be some legitimate evidence about Archytas out there that may have eluded Huffman's remarkably thorough edition.

Spurious Writings and Testimony

Some of the works that go under the name Archytas are clearly spurious. And so editors like Huffman are surely right to be suspicious of such material. But Huffman has gone too far in condemning two significant groups of fragments that seem to me to have a good claim to having been written by Archytas. They certainly cannot be ruled out as being by him, and they are both much more substantial than much of what goes under the heading 'genuine testimonia'. In fact, the fragments of *On Wisdom* and *On Law and Justice* seem to me to have better than even chances of being 'fragments' of Archytas in Huffman's sense. And if this were so for either of them, we would have here more material than in all the other 'fragments' of Archytas combined.

I will quote them extensively in what follows, along with Huffman's considerations, because I think that there is a serious risk that, as Huffman's edition becomes standard, as it should, his position on the dubia will become standard as well, but it should not. The following fragments come from the same two sources that Huffman uses to produce half of his genuine fragments: Iamblichus (the primary source of Fragment 3) and Stobaeus (the primary source for Fragment 4).

On Wisdom

Five substantial fragments of this work seem to be preserved in Iamblichus' *Protrepticus* (*Jamblique: Protreptique*, ed. E. DesPlaces, Paris, 1989). Iamblichus names Archytas, the title of the book, and even, in one or two places, the location within the book. Huffman elsewhere considers Iamblichus a reliable source, remarking with reference to an excerpt of Aristotle's book on the Pythagoreans that 'the onus of proof rests on anyone who argues that Iamblichus has intervened in the text' (565-566). Some recent research in which I am involved has shown Iamblichus to be an extremely good witness, never altering his source text (except to excise dialogue) and preserving the original order of his quotations (D.S. Hutchinson and M.R. Johnson, 'Authenticating Aristotle's *Protrepticus*', *Oxford Studies in Ancient Philosophy* [2005] 29: 193-294). Now it is clear that Iamblichus can be duped by a forgery, since he (along with Simplicius) accepts *Concerning the Whole System of Categories* as genuine, even though it is

manifestly a plagiarism of Aristotle's *Categories* with Archytas' name pasted on it with a result like that of the legendary undergraduate student who, when asked to write an essay on Aristotle on friendship, submitted a translation of *Nicomachean Ethics* viii-ix that was floating around the internet.

But there is no good reason to think that anything like that has happened in the case of the *On Wisdom*. Because the excerpts preserved by Iamblichus are fairly brief, and at present hardly accessible (Huffman does not include them in his volume), let me roughly translate them here, along with some of the context in Iamblichus.

1. Archytas, *De sapient.*, Fr. 1 Thesleff (p. 43, 25-44, 3) apud Iamblichus, *Protrepticus* 4 (48.26-49.8 Des Places).

Archytas then, right at the beginning of his *On Wisdom* (ἐν τῷ Περὶ σοφίας εὐθὺς ἀρχόμενος) exhorts in this way:

In all other human practices, wisdom is distinguished, just as vision is from the senses of the body, and as intelligence is from the soul, and as the sun is from the stars. For vision is the most far-reaching and most variegated relative to the other senses; intelligence is supreme in its use of reason and intellect to judge that which must be done, being a vision and power of the most valuable subjects; and the sun is the eye and soul of things that are natural; for through it all things are seen and generated and comprehended, and stemming from it and being born from it, they are nourished and strengthened, and lit up with sense.

2. Archytas, *De sapient.*, Fr. 2 Thesleff (p. 44, 5-15) apud Iamblichus, *Protrepticus* 4 (50.26-51.15 Des Places).

Now then, the approach that proceeds from wisdom being valuable to an exhortation is of that kind <sc. the foregoing>; and the one that proceeds from what is truly human, but suggests the exhortation to the same things, is exhibited by these words:

Of all the animals, the human has been born the wisest. For he has the power to observe and contemplate (θεωρῆσαι) the things that exist, and to get knowledge and intelligence about them all. Wherefore the divine both engraved and inscribed in him the system of universal reason and speech (λόγῳ), in which all the kinds (εἴδη) of things that exist have been distributed, along with the meanings of the nouns and the verbs. Indeed, a place for the utterances of the voice has been marked off: pharynx, mouth, and nostrils. But just as the human has been born with an organ of the utterances, through which the nouns and verbs in being marked are indicated, so too he is born with one <sc. an organ> for the concepts that are in the

¹ Reading ὀπτιζομένοις and rejecting the conjecture ὀπτιζομένων of Gale.

things that exist visibly.¹ This, it seems to me, is the function of wisdom, for the sake of which the human person was born and is constituted, and for which he has received organs and powers from the god. This is the approach to the exhortation from the nature into which the human person was born.

3. Archytas, *De sapient.*, Fr. 3 Thesleff (p. 44, 17-20) apud Iamblichus, *Protrepticus* 4 (52.15-18 Des Places).

He [sc. Archytas], using a mixed approach to the same things, also exhorts in this way:

The human person has been born and constituted to observe and contemplate the reason (θεωρῆσαι τὸν λόγον) of the whole of nature. And so wisdom has the function of observing the intelligence of all the things that exist.

4. Archytas, *De sapient.*, Fr. 4 Thesleff (p. 44, 22-28) apud Iamblichus, *Protrepticus* 4 (53.12-19 Des Places).

Since the good of wisdom is made more apparent as it becomes common and extended to all things, so too the exhortation to it becomes more complete through the following [words of Archytas]:

Wisdom is not concerned with some particular thing among the things that exist, but with all the things that exist, absolutely; and it is necessary that it not discover the principles of them <sc. particular things> at first, but rather that which is common to the things that exist; for the relation between wisdom and all the things that exist is like vision to the things that are visible. It is native to wisdom both to perceive and to observe and contemplate (θεωρεῖν) all the universal attributes, and that is how wisdom discovers the principles of all things that exist.

5. Archytas, *De sapient.*, Fr. 5 Thesleff (p. 44, 31-45, 4) apud Iamblichus, *Protrepticus* 4 (54.9-21 Des Places).

In the end [of his book] (ἐν τῷ τέλει), the advice ascends to that which is highest in this way:

Whoever is able to analyze, and again to synthesize and to enumerate, all the kinds under one and the same principle, seems to me to be the most wise and most true. And he will also discover a beautiful vista from which he will have the power to observe the divine and all the things coordinated with it and ordered separately. And driving through the passage along this wide road, being impelled in the right direction by his mind, he will arrive at the end of his course, uniting the principles with the limits, and comprehending why god is the beginning, middle, and end of all the things accomplished in accordance with justice and right reason.

Now consider Huffman's reasons for rejecting these fragments (588-589):

The treatment of wisdom and its relationship to wisdom and

mathematics in ‘Archytas’ *On Wisdom* is dependent on Aristotle’s account of wisdom in the *Metaphysics*. ‘Archytas’ emphasizes that wisdom deals with the principles of all things (τὰς τῶν ἐόντων ἀπάντων ἀρχάς, 44.27-8, 146.15). In *Metaphysics* I Aristotle identifies wisdom with first philosophy or metaphysics and asserts that it deals with the principles (ἀρχάς) and in particular with the first principles (τῶν πρώτων ἀρχῶν) of all things (982a2, 982b9). In *Metaphysics* IV Aristotle emphasizes that metaphysics studies being in general (καθόλου περὶ τοῦ ὄντος 1003a24), whereas the particular sciences divide off some portion of being (μέρος αὐτοῦ τι ἀποτεμνόμεναι) and study the characteristic of this portion (περὶ τούτου θεωροῦσι τὸ συμβεβηκός 1003a26). In *On Wisdom* it is said that wisdom studies the general characteristics of all things (τὰ ὧν καθόλω πᾶσι συμβεβηκότα...θεωρῆν 44.26), and the mathematical sciences are described as the sciences concerned with something divided off (τι ἀφορισμένον sc. from the rest of being) and as dealing with the particular characteristics of that division of being (τὰ δ’ ἴδια καθ’ ἕκαστον [συμβεβακόντα] 146.14). The relation between wisdom, physics and mathematics outlined in *On Wisdom* is recognizably the same as that proposed by Aristotle at *Metaphysics* 1061b18 ff. There are also some striking similarities in particular aspects of the treatment of wisdom. Thus *On Wisdom* says that wisdom is able to survey everything in the table of opposites (πάντα τὰ ἐν τῇ συστοιχίᾳ, 44.35 and 146.21). It is true of course that the table of opposites is identified as Pythagorean by Aristotle (*Metaph.* 986a23 ff.), but Aristotle himself uses the table in places, and he particularly refers to it in his discussion of wisdom/first philosophy in *Metaphysics* IV. He says that it will belong to first philosophy to study both unity and its opposite plurality (1004a10) as well as the other basic oppositions, and he refers explicitly to the table of opposites at 1004b28 (συστοιχία).

Huffman is certainly right that there are all these parallels; the question is what to make of them.

One option, which Huffman goes for, is that some later Pythagorean, using two different books of Aristotle’s *Metaphysics*, constructed a protreptic text out of it and attributed it to Archytas. But it is certainly possible that Archytas is the author of the passages, and that it is Aristotle in the *Metaphysics* that is indebted to Archytas, and not the pseudo-Archytas to Aristotle. This possibility becomes a probability when we consider Huffman’s demonstration that Aristotle was intimately familiar with the works of Archytas, that he wrote his own works on Archytas’ philosophy, both ‘on’ it (Περὶ τῆς Ἀρχυτείου φιλοσοφίας) and in

some sense ‘out of’ it (ἐκ τῶν Ἀρχυτείων), that he was impressed and influenced by the philosophy of Archytas, and that several of his own students went on to document the tremendous influence of Archytas on ancient philosophy. As Huffman says in a slightly different context: ‘One must remember that Aristotle studied Archytas’ work carefully and wrote three books on Archytas so that Archytan influence on Aristotle is always a possibility’ (602).

The fragments from the *On Wisdom* are, obviously, protreptic; this is why they were excerpted by Iamblichus. And it is certain that Archytas wrote protreptic words. As Huffman points out, ‘fragment 4, then, turns out to be a protreptic for the study of logistic, which appeals to the value of logistic for attaining wisdom, i.e., the knowledge of the highest things, which allows us to order ourselves and the state well’ (240). Now we are told by Stobaeus that that fragment comes from a book entitled *Occupations* (Διατριβῶν, see Huffman’s arguments for the maximally generic translation *Discourses* for this highly disputed term, 228-232). It is worth considering the possibility that, as with the alternative titles for Fragments 1-2 (126, 167-168), what we have here are alternative titles for the same protreptic work, in which Archytas engaged in the typically hortatory exercise of weighing the relative values of various intellectual occupations (apparently concluding that ‘logistic’ was preeminent among them). It is far from clear, then, that we should doubt that Archytas is the author of these words on the grounds that there are strong parallels between the words of ‘Archytas’ and those of Aristotle. One might just as well take it as an argument for their being genuine, if one is otherwise convinced that Archytas was a major influence on Aristotle.

Many of the parallels mentioned by Huffman relate to the idea that wisdom deals with ‘all things’. Now this was clearly a fifth century commonplace, not an idea original with Aristotle. Consider the following:

The first principle is...some other nature which is indefinite,
out of which come to be all the heavens and the worlds in them
(Anaximander, DK 12B1)

All things that come into being and grow are earth and water
(Xenophanes, DK 21B29)

All things come to be in accordance with this logos (Heraclitus, DK 22B1)

There is a need for you to learn all things (Parmenides, DK 28B1)

All things were together (Anaxagoras, DK 59B1)

The four roots of all things (Empedocles, DK 31B6)

Nothing happens at random but all things as out of necessity
and for a reason (Leucippus, DK 67B2)

A human being is the measure of all things (Protagoras, DK 80B1).

In my opinion, to sum it all up, all things that are, are differentiated from the same thing and are the same thing (Diogenes of Apollonia, DK 64B2).

I have of course not offered anything like a proof that the excerpts in Iamblichus' *Protrepticus* were really written by Archytas, but I do think that the burden of proof should be on the skeptic to show that they were not. And I do not find anything in Huffman's arguments that show this. And so I would argue that we can considerably enlarge our base of evidence for Archytas by thinking about these excerpts.

On Law and Justice

Stobaeus preserves five substantial passages that he attributes to Archytas, naming the work *On Law and Justice*. Again, so that these fragments not be unduly neglected, I have provided some (very rough) translations of them below, so that you might consider whether Huffman's arguments against their being included in 'genuine fragments' are warranted.

1. Archytas, *De leg.* Fr. 1, apud Stob. 4.1.135 p. 82 He. (Thesleff, p. 33.3-18).

Archytas the Pythagorean from his *On Law and Justice*:

Law and the human soul and way of life are related in the same way that harmony is related to hearing and voice. For the law teaches the soul and constitutes its way of life, and harmony makes the hearer knowledgeable and regulates the voice.

I think that every community is comprised of ruler, ruled, and thirdly laws. Of laws, one kind is living, the king, but the other kind is inanimate, the written ones. Thus the law is primary: for because of it the king is legitimate, the ruler follows, the one ruled is free, and whole community is happy. But when it is violated, the king is a tyrant, the ruler disobeys, the one ruled is a slave, and the whole community is miserable. For the affairs [of state] are strung together out of the rule, the ruled, and thirdly out of strength. Rule is at home with the stronger, and being ruled with the weaker, but the strength with both. For reason rules the soul, and the irrational is ruled, but both overpower the passions. Virtue is born out of the harmonious cooperation of each, and it leads the soul away from pleasures and away from pains towards peace and immunity (*ἀπάθειαν*).

2. Archytas, *De leg.* Fr. 2, apud Stob. 4.1.136 p. 84 He. (Thesleff, p. 33.19-28).

In the same work:

It is necessary for the law to be a follower of nature, to be powerful with respect to business, and to be beneficial to the political community. For lacking one or two or all of these, it will not be law or not a complete law. The law would be a follower of nature by imitating natural justice; this is the proportionate distribution to each one according to one's worth. It would be

powerful if it is in harmony with those it governs. For many are not adequate to receive the good that is primary with respect to nature, but only the good relative to themselves and what is possible for them; for that is how the sick and the suffering have to be cared for.

3. Archytas, *De leg.* Fr. 3, apud Stob. 4.1.137 p. 84 He. (Thesleff, p. 33.30-34.14).

In the same work:

And the law would be beneficial to the political community if it is neither monarchical nor in the service of private interest, but is in the public interest and is applied to everyone. And it is necessary for it to consider the lands and the place. Not all of them produce the same fruit, for neither does the soul of every man produce the same virtue. That is why some establish aristocracies, some democracies, and others oligarchies. Now the aristocratic is established on the basis of the sub-contrary mean. This proportion distributes the greater portion to the greater, and the lesser to the lesser. The democratic is in accordance with the geometrical [mean], for [it distributes] the greater and the lesser [portions] equally. And the oligarchic and tyrannical are in accordance with the arithmetical [mean], for this is the opposite of the sub-contrary, since it [distributes] the greater [portion] to the lesser, and lesser to the greater. There are this many forms of distribution, and they can be observed in both political constitutions and households. For honors, punishments, and rule is distributed either equally to the greater and the lesser, or unequally on the basis of virtue or wealth or power; the democratic [distributing] equally, and the aristocratic and oligarchic unequally.

4. Archytas, *De leg.* Fr. 4, apud Stob. 4.1.138 p. 85 He. (Thesleff, p. 34.16-35.30).

In the same work:

And the stronger law and city must both be a synthesis of the other constitutions and have something democratic, something oligarchic, and something kingly and aristocratic, as it is in Sparta as well. For there the king is monarchical, the elders aristocratic, the guardians oligarchic, and the cavalry along with the youths democratic. Indeed, the law must be not only good and noble, but its parts must be counterbalancing. For in this way it will be strong and durable. But by 'counterbalancing' I mean that the ruler must both rule and be ruled, as in those well thought out laws of the Spartans. For the king is counterbalanced by the guardians, and the guardians by the elders, and in the middle are the youths and the cavalry. For when they see

one getting more than their fair share of the rule, they support the others.

The law must first take up the gods, the demons, the parents, and in general the things that are noble and valuable, and secondly the things that are beneficial; for the lesser should follow the greater. And the law should be inscribed not in the houses and on the doors, but in the habits of the citizens. For not even in Sparta is the state managed by its several laws, as well thought out as they are, but rather in the decisions of its citizens.

And the law will be beneficial to the political community neither by being monarchic nor in the private interest, but by being in the public interest and distributed to all; and if it gives punishments and penalties in order to shame the criminal, and not in order to take his property. For to punish with shame is to make the better class of people more orderly and more useful, in order that they not meet with the penalties imposed by law. But if [the penalty is constructed] out of property, they will make property the most important thing, considering it the greatest cure for their ills when they commit crime.

It would be best for the whole city to be arranged in such a way that it requires nothing from the outside: neither for the sake of virtue, for the sake of power, or for any other cause. For this is the way in which a body, a household, and an army are arranged well: by having in itself—and not from the outside—the cause of its own security. For thus the body will be stronger, the household well supplied, and the army neither mercenary nor untrained. For the things that are ordered together in this way become stronger than others. They are both free and not enslaved because they do not require many things for preservation, except a few things that are easily obtained. For thus the strong man is superior to heaviness, and the athlete to cold; for people are exercised by misfortunes and circumstances. To the temperate man, who has labored hard with his body and soul, all food and drink, and even a bed of straw, seems pleasant; but the luxurious one who has gone through life easily like a Sybarite is difficult to satisfy and is alienated even with the advantages of the Great King.

The law must penetrate into the characters and pursuits of the citizens. For, in this way, it will make the citizens self-sufficient, and it will impose and distribute to each in accordance with their worth. For, in this way too, the sun being carried through the Zodiac distributes to the whole earth birth, nutrition, and life in the proper amount, by establishing wisely the

right temperature of the seasons. And for this reason we call Zeus ‘*Nomios*’ (shepherd) from ‘*Nemēios*’ (distributor), and we call the one who distributes the food to the sheep ‘*Nomeus*’. And the verses sung by those who play the lyre we call ‘*nomoi*’ (‘melodies’; but also ‘laws’), because they order the soul as they are sung with harmony, rhythm, and measure.

5. Archytas, *De leg.* Apud Stob. 4.5.61 p. 218 He. (= Thesleff, p. 36.2-11).

Archytas the Pythagorean out of his *On Law and Justice*:

The true ruler must not only have knowledge and the capacity for ruling well, but also a love of humanity. For it would be absurd for a shepherd to hate his flock, and to be hostile towards his creatures. And he must be observant of law (νόμου), for then he will have the authority of a ruler. Because of his knowledge he will be able judge well; because of this capacity he will be able to punish; because of this most useful thing he will also be able to be nice; and because of the laws he will be able to do everything in accordance with reason. Among rulers the best would be the one closest to the law, and this would be the one who acts not for the sake of himself but for those under him, since the law does not exist for the sake of him, but for those under him.

Huffman says of *On Law and Justice* that ‘the treatise should be regarded as spurious, although the evidence is almost equally divided’ (601). The most extensive study of the fragments, that of A. Delatte in his *Essai sur la politique pythagoricienne*, concludes that there are no indications of apocryphal or late composition (Paris, 1922). These views are also endorsed by E.L. Minar in *Early Pythagorean Politics in Practice and Theory* (Baltimore, 1942: 111), J.S. Morrison, ‘Pythagoras of Samos’ in *Classical Quarterly* (1956) n.s. 6: 135-156 at 155, and H. Thesleff in *An Introduction to the Pythagorean Writings of the Hellenistic Period* (Åbo, 1961: 35, 112). Michel Foucault treated the fragments of *On Law and Justice* as genuine, and gave an interesting analysis of the political metaphor of the shepherd and its rarity in Greek thought (‘“Omnes et Singulatim”: toward a critique of practical wisdom’, *Power: essential works of Foucault, 1954-1984, Volume 3*, ed. J.D. Faubion (New York, 2001): 298-325).

The reasons given for rejecting the fragments have been numerous. Diels and Kranz considered only the mathematical fragments as genuine; Zeller thought they contained conceptions too similar to Plato and Aristotle. Gruppe thought they contained a reference to the Platonic theory of forms, but also rejected them on the grounds that ‘the leader as shepherd was of Eastern, Hebraic origin’ (1840, 91-92). Aalders did not study the fragments directly, but ruled them out for a priori reasons, such as the unlikelihood that Archytas would use Sparta as a model for democracy. Burkert (cited above) thinks that the spuriousness is obvious from the use of ἀπάθειαν, but his relegation of the matter to a footnote indicates his own lack of conviction (78n156).

It is easy to show that all of these reasons are bad ones. The DK policy of admitting only mathematical fragments gives merely the appearance of methodological rigor. Huffman has decisively shown that the ‘Mathematician King’ had political as well as mathematical interests, and that his mathematical interests were, like Philolaus’, literally universal in scope. Aalder’s argument about the unlikelihood that Archytas would use Sparta as a model is exactly backwards, given that Tarentum was a Spartan colony and maintained good relations with Sparta (601); Huffman ruins Aalder’s other arguments in this vain, showing them to be ‘weak’ (601-602). The presence of the words *ideai* and *eikontes* might be thought a reference to Platonic forms and appearances, but this language was in fact common to fifth and fourth century philosophy, and at any rate the specific context shows that the term is used with the conventional meaning of ‘kinds’. Furthermore, the passage contains none of the Platonizing language of participation present in other spurious Archytan works. Moraux showed that the fragments of *On Law* shared certain questions and themes with Aristotle’s *Politics*, but as Huffman rightly argues: ‘what he does not show, however, is that the presentation in *On Law* need be derived from Aristotle rather than being Archytas’ response to common issues in the political philosophy of the fourth century’ (600-601).

Huffman’s own arguments against authenticity amount to two: first, ‘the connections it shows with surely spurious Pythagorean treatises’; and second ‘its failure to connect with the genuine fragments and testimonia of Archytas which deal with ethical and political issues’. I find neither argument compelling. There is nothing explicitly anachronistic in the fragments, and they show considerable originality. If these were a forgery, they were quite worthy of their model. As for the second reason, I have already mentioned some parallels with the ‘genuine fragments’ above, in particular Fragments 2-3. There are also some interesting connections with *On Wisdom*, for example the imagery of the sun in *On Wisdom* Fragment 1 and *On Law* Fragment 4. But I put little weight on the argument, since so much of Archytas’ writings has gone lost. It is one thing to claim that a report of Plato’s views seems to relate to nothing in his writings, since we have all of those writings (or at least those he published). But for Archytas, we seem to have none of them, and so this can hardly be a probative consideration.

Conclusion

Huffman’s work is a tremendous contribution to the field of ancient philosophy. He has set the study of Archytas and Pythagoreanism on much more solid ground. He has illuminated ideas of Archytas that have seemed arcane, and he has provided many persuasive parallels that demonstrate Archytas’ centrality to fourth century philosophy. He has made an extremely persuasive case for considering four quotations (five, in fact) in other ancient sources to be ‘genuine fragments’ of Archytas. I do not think that he has made a persuasive case for excluding some other quotations as genuine fragments, in particular those from *On Wisdom* and *On Law and Justice*. Huffman announced in the preface to his

book that he wanted to provide not a definitive edition but ‘a reliable basis on which study of Archytas can build’ and he hopes that his ‘interpretation of Archytas’ philosophy will stimulate further work’. It should, and I think it is clear that it will.²

Department of Philosophy
University of California, San Diego
La Jolla CA 92093-0119

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