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TWO KINDS OF EQUALITY

BY

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All animals are equal but some animals are more equal than others.
George Orwell, *Animal Farm*.

Equality was a fundamental principle of Greek democracy. In this paper I propose, first, to trace the history of one form of opposition to that principle, the theory of geometric proportion; and, secondly, to examine some recent speculation on geometric and harmonic proportion*).

I ARITHMETICAL AND GEOMETRIC PROPORTION: THE HISTORY OF AN IDEA

(i) *The background*

Greek democrats believed that all citizens should be equal¹). The claim is easily misunderstood; modern theorists prefer to say that no-one should receive preferential treatment unless there is a relevant justification for it²). But Greek democrats, with their simpler formulation of the principle, were open to the criticism that in their passion for equality they neglected the claims of merit.

The idea that an exceptional man deserves exceptional rights is

* I am greatly indebted to Mr. P. A. Brunt, Professor G. E. L. Owen and Mr. G. E. M. de Ste. Croix for help and criticism at an early stage; they are not, however, responsible for my views as they now stand.

I regret that at the time of writing two dissertations which deal with this subject were not available to me: A. MEDER *Der athenische Demos zur Zeit des peloponnesischen Krieges im Lichte zeitgenössischer Quellen*, Diss. Munich, 1938 (p. 37 with n. 112); and G. GROSSMANN *Politische Schlagwörter aus der Zeit des Peloponnesischen Krieges* Diss. Basel, 1950 (p. 44 ff.).

¹) HDT. 3,80,6; EUR. *Suppl.* 438-41; ISOCR. 20 (*Lochites*) 20; PS.-ANDOC. 4 (*Alcib.*) 13, 16, 27; PL. *RP* 557 A; AR. *Pol.* 1317 B 3-7; etc.

²) e.g. S. I. BEEN and R. S. PETERS *Social Principles and the Democratic State* (London, 1959), 110, 114.

first found in a military context, in Homer. Achilles in the *Iliad* grumbles that a man gets an equal share of booty whether he just sits around, or whether he fights his hardest: ἐν δὲ ἴῃ τιμῇ ἡμὲν κακὸς ἢ δὲ καὶ ἐσθλός³). This is a legitimate grumble, for whether a man fights or not is relevant to the amount of booty he deserves. Aristotle, however, cites this line in a political context: οἱ χαρίεντες, he says, στασιάζουσιν περὶ τῶν τιμῶν, ἐὰν ἴσαι· ὅθεν καὶ ἐν δὲ ἴῃ τιμῇ ἡμὲν κακὸς ἢ δὲ καὶ ἐσθλός⁴). In Homer, the κακός was the coward, and the ἐσθλός the brave man; but the words are used, like οἱ χαρίεντες, to denote social classes. τιμή is now political power; and the justification is altogether different⁵).

It is in the pages of Thucydides that we first encounter this line of reasoning transferred to the political sphere. It is attributed by Athenagoras of Syracuse to his opponents: "Someone will say that democracy is not intelligent or ἴσον, but that those who have money are also those who are best at ruling"⁶). The criticism now takes the paradoxical form that democratic ἰσότης is in fact not ἴσον. But it is not only the critics of democracy who make use of this idea, for it certainly lies behind the well-known passage in Pericles' funeral speech: μέτεστι δὲ κατὰ μὲν τοὺς νόμους πρὸς τὰ ἴδια διάφορα πᾶσι τὸ ἴσον, κατὰ δὲ τὴν ἀξίωσιν, ὥς ἕκαστος ἐν τῷ εὐδοκίμῳ, οὐκ ἀπὸ μέρους τὸ πλεον ἐς τὰ κοινὰ ἢ ἀπ' ἀρετῆς προτιμᾶται: "but while the law secures equality to all alike in their private disputes, the claim of excellence is also recognized; and when a citizen is in any way distinguished, he is generally preferred to the public service, not in rotation, but for merit"⁷). Pericles is claiming, in fact, that the opponents of democracy were wrong in their assertion that democracy was so obsessed with equality that it ignored all other considerations.

Yet these same criticisms continued to be made by non-democrats;

³) *Iliad* 9,319. Line 320, which interprets the "equal share" as death, is usually, and rightly, regarded as an interpolation.

⁴) *Pol.* 1267 A 1-2.

⁵) cf. Eur. *Hecuba* 306 B; Xen. *Cyrop.* 2,2,18 - 2,3,16; the contexts here are still military, as in the *Iliad*. For a non-military context, cf. Soph. *Antig.* 519-20.

⁶) *Th.* 6,39,1.

⁷) *Th.* 2,37,1, trs. Jowett revised Brunt.

for example, in the *Republic* Socrates criticizes democracy for ἰσότητά τινα ὁμοίως ἴσους τε καὶ ἀνίσους διανεμύσασθ⁸). Plato claims no novelty for this: it is a well-known complaint, says Adeimantus⁹). But Plato has in mind a more detailed argument which by this had attached itself to the old ideas. The new stream of thought has its source in mathematics.

(ii) The three proportions of Archytas

Archytas of Tarentum, a Pythagorean who flourished in the early fourth century, wrote in his work on music¹⁰:

"There are three proportions in music: (i) the arithmetical, (ii) the geometric, (iii) the subcontrary which they call harmonic.

The *arithmetical* is when there are three terms which stand in the following relation to one another in proportion: the first exceeds the second by the same amount as the second exceeds the third (e.g. 6, 4 and 2, where $6 - 4 = 4 - 2$). And in this proportion it is the case that

⁸) Pl. *RP* 558 C.

⁹) γνώριμα λέγεις, ib. Cf. n. 195-196.

¹⁰) Diels-Krantz *Die Fragmente der Vorsokratiker* (Berlin, 1951) (henceforward DK) 47 B 2: μέσαι δὲ ἐντι τρεῖς τῶ μουσικῇ, μία μὲν ἀριθμητικῇ, δευτέρα δὲ ἀ γεωμετρικῇ, τρίτη δ' ὑπεναντία, ἀν καλέοντι ἀρμονικῇ. ἀριθμητικῇ μὲν, ὅκκα ἔωντι τρεῖς ὅροι κατὰ τὴν τοῖαν ὑπεροχάν ἀνά λόγῳ· ὃ πρῶτος δευτέρου ὑπερέχει, τοῦτο δευτερος τρίτου ὑπερέχει. καὶ ἐν ταύτῃ <τῇ> ἀναλογία συμπέπει ἦμεν τὸ τῶν μειζόνων ὥρων διάστημα μείων, τὸ δὲ τῶν μειόνων μειζόν. ἀ γεωμετρικῇ δὲ, ὅκκα ἔωντι οἷος ὁ πρῶτος ποτὶ τὸν δευτερον. καὶ ὁ δευτερος ποτὶ τὸν τρίτον. τούτων δ' οἱ μειζονες ἴσον ποιοῦνται τὸ διάστημα καὶ οἱ μείους. ἀ δ' ὑπεναντία, ἀν καλοῦμεν ἀρμονικῇ, ὅκκα ἔωντι <τοῖσι> ὃ· ὁ πρῶτος ὅρος ὑπερέχει τοῦ δευτέρου αὐταύτου μέρει, τοῦτο ὁ μέσος τοῦ τρίτου ὑπερέχει τοῦ τρίτου μέρει. γίνεται δ' ἐν ταύτῃ τῇ ἀναλογίᾳ τὸ τῶν μειζόνων ὥρων διάστημα μείων, τὸ δὲ τῶν μειόνων μείων. Passages in brackets in the translation are not of course in the text of Archytas. I take the examples from Diels.

It would be as well to define the quasi-technical terms used in this theory: ἀναλογία: *proportion* (see M.L. d'Ooge's trs. of Nicomachus of Gerasa, *Arithm.* (New York, 1926), n. on 2,21,1 (p. 264)).

διάστημα: *ratio* (an unusual meaning, but the only one that will make sense in the Archytas passage. LSJ s.v. διάστημα 4 cite only this and Ar. *Phys.* 202 A 18 (where, again, no other sense is possible) for this meaning).

ἰσότης: *equality; equality of ratios; proportion*

μέσος: *mean; proportion*

μεσότης: *mean; proportion* (this second sense is not given by LSJ; but the word is certainly so used, e.g. ps.-Archytas ap. Stob. 4,1,137. See d'Ooge, *loc. cit.*)

ὅρος: *term of a ratio* (but not in this sense in Pl. *RP* 443 A; see pp. 142-144)

ὑπεροχή: *excess*.

the ratio between the larger terms is smaller, and that between the smaller greater (i.e. 6 is $1\frac{1}{2}$ times 4; but 4 is twice 2, a greater ratio).

The *geometric* is when the first stands in the same relation to the second as the second to the third (e.g. 8, 4 and 2, where $8 : 4 :: 4 : 2$). And of these the greater are in the same ratio as the smaller (i.e. 8 is twice 4; and 4 is twice 2).

The subcontrary, which we call *harmonic*, is when they are as follows: the first term exceeds the second by the same fraction of itself as the fraction of the third by which the second term exceeds the third (e.g. 6, 4 and 3, where $6 - 4 = 2$, i. e. $\frac{1}{3}$ of 6; and $4 - 3 = 1$, i.e. $\frac{1}{3}$ of 3). And in this proportion the ratio between the greater terms is greater, and that between the lesser less (i.e. 6 is $1\frac{1}{2}$ times 4; but 4 is $1\frac{1}{3}$ times 3, a lesser ratio)¹¹).

(iii) The political application of the proportions of Archytas

Unlikely as it might seem, the first two of these proportions were applied to politics. The arithmetical proportion, it was claimed, was a paradigm of a democracy; the geometric, of a "better" form of constitution. The analogy works out as follows. Democrats praise equality; but their equality is arithmetical proportion. This at first sight would appear to be perfect equality, since each number stands at an equal distance from its neighbours (12, 10, 8, 6, 4, 2). So, in a democracy, each man gets equal rights. But it takes no account of the *value* of each number, or of each man. Here there is flagrant inequality: the higher up the scale you go, the smaller the ratio (4 is twice 2; 6 is $1\frac{1}{2}$ times 4; 8 is $1\frac{1}{3}$ times 6 – and so on); in political terms, the better the man, the less his worth is rewarded.

But now look at geometric proportion. This is not democratic, but (the argument goes) it is much fairer. At first sight, equality would seem to have vanished, for each number no longer stands at an equal distance from its neighbours (64, 32, 16, 8, 4, 2). So, in this kind of

¹¹ I have translated the passage on harmonic proportion for the sake of completeness; it was never applied to politics by Archytas or any writer in the classical period; but see pp. 123–126 and part II.

constitution, each man does not get equal rights. But it does take account of the value of each number, and of each man. Here there is perfect equality; all the way up the scale, the ratio remains the same (4 is twice 2; 8 is twice 4; 16 is twice 8; and so on); in political terms, what a man receives is always equal to his worth¹²).

This, it must be confessed, is a scheme of great ingenuity, and even elegance. The moral is clear. The equality of which the democrats boast is really only a superficial equality; whereas the so-called inequality of the non-democrats is in fact a true and satisfying equality.

Who was the first man to apply this scheme to politics? I believe that a very strong case can be made out for Archytas, on the basis of another fragment concerned with *logismos*¹³. "*Logismos* when discovered stops *stasis*", says Archytas, "and increases *homonoia*; when it occurs, there is no *pleonexia*, but there is *isotēs*; for by this we settle our disputes. By this, then, the poor take from the powerful, and the rich give to the needy, both sides trusting that through this they will get τὸ ἴσον. It is a rule and it prevents men from doing wrong: it stops those who know how to calculate before they do wrong, persuading them that they will not be able to escape notice, when they come to it; and it prevents those

¹² This is a difficult and occasionally obscure topic, and it is regrettable that the latest discussion of it, by G. R. Morrow *Plato's Cretan City* (Princeton, 1960), 524–5, is confused. The mathematical formulas, he writes (524), "suggest that the mean carries in itself proportionate elements of the two extremes". The theory of proportion "may be the source of the idea that the mean in politics is a mixture of its two extremes" (525). He then cites Thucydides' reference (8.97.2) to the Theramenean constitution as a "measured fusion" to the benefit of the few and the many. But the two ideas are totally distinct. In the theory which we are discussing, each different kind of proportion symbolizes a different constitution; the terms stand for individuals, for people. There is no question whatever of a mean between constitutions, where the terms stand for constitutions, nor of a mixture of constitutions (whatever that may be: see R. Robinson, *trs. of and commentary on Aristotle's Politics* III and IV (Oxford, 1962), 90–1, 93–4, 100–1). It so happens that ps.-Archytas discusses both the proportion idea (Stob. 4.1.137) and the mixed constitution (Stob. 4.1.138); but he does not assimilate them.

¹³ DK 47 B 3: στάσιν μὲν ἔπαυσεν, ὁμόνοιαν δὲ αὐξήσεν λογισμὸς εὐρεθείς· πλεονεξία τε γὰρ οὐκ ἔστι τούτου γενομένου καὶ ἰσότης ἔστιν· τούτῳ γὰρ περὶ τῶν συναλλαγματικῶν διαλλασσόμεθα. διὰ τοῦτον οὖν οἱ πένητες λαμβάνονται παρὰ τῶν δυναμένων, οἱ τε πλούσιοι δίδονται τοῖς δεομένοις, πιστεύοντες ἀμφοτέρω διὰ τοῦτο τὸ ἴσον εἶναι. κανὼν δὲ καὶ κολυτῆρ τῶν ἀδικούντων <ἔδωκ> τοὺς μὲν ἐπισταμένους λογίζεσθαι πρὶν ἀδικεῖν ἔπαυσεν, πείσας ὅτι οὐ δυνασούνται λαθεῖν, ὅταν ἐπ' αὐτὸν ἔλθωσι· τοὺς δὲ μὴ ἐπισταμένους, ἐν αὐτῷ δηλώσας ἀδικούντας, ἐκώλυεν ἀδικῆσαι.

who do not know from doing wrong, showing by that very fact (i.e. that they do not know how to calculate) that they are doing wrong"¹⁴).

The significance of this passage depends, of course, entirely on the meaning given to the word *logismos*. Its usual meaning is "calculation" in the most general sense; and that would make some sort of sense here. But can Archytas perhaps be alluding to geometric proportion? This is a very tempting suggestion: let us see what this interpretation would entail¹⁵. Let us imagine an Archytan state, in which there is a first-rate man, A; we may give him the value 16. There is also an incapable buffoon, B, value 2¹⁶. They both realise their own worth. (This extra premiss is essential.) So there is no *stasis* or *pleonexia*, because B has the rights and duties and the wealth he deserves, and so has A, this means *homonoia*, and true equality in the sense already explained. But suppose that B, for some reason, is short of money, and does not have the amount which, as a 2-man, he deserves, while A is too prosperous for a 16-man. The remedy is simple: "both sides trust that through the *logismos* they will get τὸ ἕσθον": the rich man gives the required amount to the poor. This is exactly what did happen in Archytas' Tarentum, as Aristotle informs us¹⁷). The same would also apply to political power and honour.

Crime, too, is prevented. Our 2-man, B, thinks that he will rob A; and then it strikes him that it will be obvious that he will, if the enterprise is successful, have more than other 2-men, and that A will have less than other 16-men; everyone will see this, and he will be caught. But C, another 2-man, fails to work all this out; he goes ahead and robs A, and his very ignorance of the application of the *logismos* shows that he is a criminal. All this, it might be suggested, is more than a trifle ludicrous. But it is, I suggest, what the fragment means. After

¹⁴) The last clause is somewhat obscure: I follow the suggestion made in the footnote in DK (I 438). Perhaps the text is not sound.

¹⁵) This passage is discussed more fully on pp. 33-7, where further reasons are given for the suggestion that there is a reference to geometric proportion. J. S. MORRISON *C.Q.* n.s. viii (1958), 213 ff., implies that *logismos* is harmonic proportion; but this was not applied to politics until late antiquity: see part II.

¹⁶) If this seems very strange, cf. *Pl. Pl.* 257 A-B; see p. 107.

¹⁷) *Ar. Pol.* 1320 B 9 ff.; see p. 139-140.

all, if an educated Greek could swallow the Platonic number¹⁸), then he could easily swallow this.

(iv) *Plato*

From Archytas, this picture of the state was passed on, directly or indirectly, to Plato. There is no clear evidence¹⁹) that the two philosophers met before its first occurrence in Plato, in the *Gorgias*²⁰); but certainly in that dialogue it is said to be a belief of the σοφοί, in other words, of the Pythagoreans²¹). "It seems to have escaped you", says Socrates to Callicles, "that geometric proportion has immense power among both gods and men; you think that you should cultivate *pleonexia* instead²²): this must be due to your ignorance of geometry"²³).

We have already noticed the occurrence of the idea in the *Republic*²⁴). We see how geometric proportion was applied to the individual at the opening of Plato's *Politicus*²⁵), a passage which is a striking confirmation of our picture of the Archytan state. Socrates: "Theodorus, I am really very much indebted to you for my introduction to Theaetetus and to our guest from Elea". Theodorus: "Good, but you are likely to be three times as much in my debt, Socrates, when they have done their task and defined the Statesman and the Philosopher as well as the Sophist for you". Socr.: "Three times as much? Really, my dear Theodorus, must it go on record that we heard our greatest mathematician say that?" Theo.: "What do you mean, Socrates?" Socr.: "Are we to say that we heard you reckoning all these three as of equal value when their real values differ to an extent that defies all your geometric

¹⁸) *Pl. RP* 546 A ff.

¹⁹) See n. 190.

²⁰) *Pl. Gorg.* 508 A. My rejection of Morrison's arguments (part II) removes objections to dating the *Gorgias* after 388; see F. R. Dodds' edition of the *Gorgias* (Oxford, 1959) 26-7, esp. n. 3 to p. 26.

²¹) Dodds, *Gorgias*, 337-8.

²²) We have seen (pp. 104-105) how Archytan theory dealt with *pleonexia*.

²³) Dodds' note on this passage (*Gorgias*, 339-40) is the best treatment of this whole subject of geometric proportion known to me. But I do not believe that harmonic proportion is to be found in the *Republic*: see pp. 142-144.

²⁴) *RP* 558 C.

²⁵) *Pl. Pol.* 257 A-B. The translation is that of J. B. SKEMP (London, 1952), slightly changed. Skemp has a good note on the passage (p. 119).

trical expressions of proportion?" Theo.: "By Ammon, god of Libya, well said, Socrates, and a fair hit! Your dropping on my blunder in calculation (*logismoi*) like this shows that you have really remembered your mathematics!"

At the end of his life, Plato returned to the idea, and set it out in full in the *Laws*²⁶), for previously he had only alluded to it in passing. "For servants and masters never can be friends", says the Athenian stranger; "nor can good and bad, merely because they are declared to have equal privileges. For to unequals equals become unequal²⁷), if they are not harmonized by measure; and both by reason of equality, and by reason of inequality, cities are filled with seditions²⁸). The old saying, that "equality makes friendship"²⁹), is happy and also true; but there is obscurity and confusion as to what sort of equality is meant. For there are two equalities (i.e. arithmetical and geometric proportion), which are called by the same name, but are in reality in many ways almost the opposite of one another; one of them may be introduced without difficulty by any state or any legislator in the distribution of honours; namely, that of measure, weight, and number, which he ensures by the lot. But there is another equality, of a better and higher kind, which is not so easily recognized. This is the judgement of Zeus; among men it avails but little³⁰); that little, however, is the source of the greatest good to individuals and states³¹). For it gives to the greater more and to the inferior less, and in proportion to the nature of each; and above all, greater honour always to the greater virtue, and to the less less; and to either in proportion to their respective measure of virtue and education. And this is justice, and is ever the true principle of states, at which we ought to aim".

Despite this extravagant praise, however, Plato thinks that geo-

²⁶ Pl. *Laws* 756 E-757 E. The translation, which is that of Jowett⁴ (Oxford, 1953), IV 324, covers only 757 A-C.

²⁷ cf. *RP* 558 C.

²⁸ cf. ARCHYTAS, DK 47 B 3, line 7; AR. *Pol.* 1301 A 37-39; Pl. *Laws* 744 C.

²⁹ ΦΙΛΟΤΕΙΣ; cf. Archytas' *homonoia* (*loc. cit.*), and the sayings of Solon quoted on p. 121.

³⁰ Perhaps Plato is thinking of the isolated experiment of Archytas at Tarentum (AR. *Pol.* 1320 b 9 ff.; see p. 139); or perhaps he is admitting that the Athenians did pay some attention to this principle (Th. 2.37.1, quoted on p. 102).

³¹ cf. *Gorg.* 508 A.

metric proportion is not to be used undiluted, δυσκολίας τῶν πολλῶν ἐνεκα: most people would not put up with it; it is to be judiciously mixed with ordinary equality³²). Why did he call it Διὸς κρίσις? The answer surely lies in the contrast with the democratic equality of the lot. This is ἀνθρώπων κρίσις, a choice involving man's idea of equality, where each man is to be regarded as having the same value as the next. Διὸς κρίσις, on the other hand, is the God's-eye view: it is the choice which Zeus would make if he were appointing people to office; and he, of course, would consider candidates on their merits.

There is also another passage in the *Laws* which shows the practical effects of geometric proportion, and with its aid we can see whether our account of the Archytas fragment is plausible. "It would be well that every man should come to the colony having all things equal; but seeing that this is not possible, and one man will have greater possessions than another, for many reasons and in particular to preserve equality in special crises of the state, qualifications of property must be unequal, in order that offices and contributions and distributions may be proportioned to the value of each person's wealth, and not solely to the virtue of his ancestors or himself, nor yet to the strength and beauty of his person, but also to the measure of his wealth or poverty; and so by a law of inequality, which will also be one of proportion, he will receive honours and offices as equally as possible (ὡς ἰσαίτατα τῷ ἀνίσῳ συμμετρῶ δέ), and there will be no quarrels and disputes. To which end there should be four different standards appointed according to the amount of property: there should be a first and a second and a third and a fourth class . . ."³³) Here, then, are four property-classes, determined on the principle of geometric proportion. Perhaps geometric proportion also lies behind the three classes of the *Republic*³⁴).

³² *Laws* 757 E.

³³ Pl. *Laws* 744 B C. The translation is again that of Jowett⁴, IV 313.

³⁴ Wealth, of course, is arranged on different principles in the *Republic*; but political rights are distributed in accordance with the general requirements of geometric proportion. Was this intentional? Plato says nothing about it; but it would square nicely with the immense importance given to geometric proportion in the *Gorgias* (508 A), and would provide a clear link between that work and the *Laws*. As for harmonic proportion in the *Republic*, it is a mirage: see pp. 142-144.

Plato's high opinion of geometric proportion (*ισότης*) may provide the answer to two related problems. "Pamphila³⁵) in the 25th book of her *Memorabilia* says that when the Arcadians and Thebans were founding Megalopolis, they invited Plato to be their legislator; but when he found that they were not willing to have equality, he refused to go"³⁶). Plato was no egalitarian; and as Morrow points out³⁷), this must be an allusion to geometric proportion – that is, if there is any value in the story at all. Secondly there is a reference in Plato's seventh Letter to the *δίκαιος καὶ ἰσόνομος πολιτεία*³⁸). The same question arises: why is Plato praising equality? And the answer is surely the same: he is thinking of geometric proportion³⁹).

(v) *Isocrates*

"I imagine", wrote Isocrates, "that we all believe that it is altogether monstrous that the good and the bad should be thought worthy of the same privileges, and that it is of the very essence of justice that distinctions should be made between them, and that those who are unlike should not be treated alike but should fare and be rewarded in each case according to their deserts. Now oligarchies and democracies seek equality for those who share in the administration of them; and the doctrine is in high favour in those governments that one man should not have the power to get more than another – a principle which works in the interest of the worthless! Monarchies, on the other hand, make the highest award to the best man, the next highest to the next best, and in the same proportion to the third and the fourth and so on. Even if this practice does not obtain everywhere, such at least is the intention of the polity. And, mark you, monarchies more than other governments keep an appraising eye upon the characters and actions of men, as everyone will admit. Who, then, that is of sound mind

³⁵) *Flouit* during the reign of Nero.

³⁶) *Diog. LAERT.* 3.23.

³⁷) G. R. MORROW, *Plato's Cretan City*, 524 n. 10.

³⁸) *Ep.* 7, 326 D.

³⁹) For the sake of completeness it should be added that two means also occur in the *Timaeus*, this time the arithmetical and the harmonic (*Tim.* 36 A (cf. *Ar. fr.* 47 Rose); cf. Taylor *ad loc.*). But here the context is cosmological, not political.

would not prefer to share in a form of government under which his own worth shall not pass unnoticed, rather than be lost in the hurly-burly of the mob and not be recognized for what he is"⁴⁰)? It is often suggested⁴¹) that there is an allusion to the doctrine of the two equalities here. This is perhaps misleading. We might divide that doctrine into three parts: (i) the assertion that democratic equality is not the best type of equality; (ii) the assertion that geometric proportion is true equality; and (iii) the demonstration of these propositions by geometric "proof". Of these, not one is found in this passage: what Isocrates says is that equality itself is wrong – and this is not the same as (i) – and that a monarchy where every man is honoured according to his worth is an ideal state of affairs. No attempt is made to claim that this too is a kind of equality, and a better kind (ii), or to "prove" it geometrically (iii). We might surmise that Isocrates knows the theory, but thinks it too complicated to put forward in a general work. (As we have seen, even Plato never gives the full mathematical working-out, although the *Georgias* and the *Politicus* passages show that he is familiar with it). Isocrates' "philosophy" was, after all, one of practical results, not of theory. There is little difference between his remarks and the general assertions made in the previous century⁴²). What makes it clear that he knows the new theory is the fact that he borrows its language: *μὴ τοὺς ἀνομοίους τῶν ὁμοίων τυγχάνειν*⁴³) is not far from Plato's "distributing a kind of equality to equals and unequals alike"⁴⁴).

The theory, never wholly convincing, is particularly ill-adapted to the absolute monarchy advocated in the *Nicoles*, "one of the strangest documents produced under the Athenian democracy by anyone who claimed to be a leader of political opinion"⁴⁵). Isocrates himself seems

⁴⁰) ISOCR. 3 (*Nic.*) 14-16. The translation is that of G. Norlin, Loeb Isocrates I 85.

⁴¹) E.g. by Norlin in his note on ISOCR. 7 (*Areop.*) 21, Loeb Isocrates II, 116, note b.

⁴²) See pp. 101-102.

⁴³) ISOCR. 3 (*Nic.*) 14.

⁴⁴) PL. *RP* 55B C.

⁴⁵) NORMAN BAYNES "Isocrates", in *Byzantine Studies and other Essays* (London, 1955), 149.

embarrassed by the fact that what he says so glibly is clearly and demonstrably false: "Monarchies make the highest award to the best man, the next highest to the next best . . . and so on. Even if this practice does not obtain everywhere, such at least is the intention of the polity". Or in other words, "What I have just said is not true, but never mind, monarchies mean well." Not only is the idea a borrowed one; it is ineptly borrowed, and its quasi-intellectual backbone is removed for popular consumption⁴⁶).

The theory also makes a brief but less shadowy appearance in the *Areopagiticus*. Here the two equalities are explicitly mentioned; the "proof" is as usual suppressed, or taken for granted. "But what contributed most to their good government of the state (i.e. the early Athenian state) was that of the two recognized kinds of equality – that which makes the same award to all alike and that which gives to each man his due – they did not fail to grasp which was the more serviceable; but, rejecting as unjust that which holds that the good and the bad are worthy of the same honours, and preferring rather that which rewards and punishes every man according to his deserts, they governed the city on this principle, not filling the offices by lot from all the citizens, but selecting the best and the ablest for each function of the state"⁴⁷).

Two points are worth noticing here. First, the theory is retrojected into the remote past⁴⁸). Secondly, arithmetical equality is associated specifically with the lot, an association made also in Plato's *Laws*⁴⁹), but not in any earlier occurrence of the theory. The idea is growing, and new concrete ideas are being added. It is difficult to say who first introduced the lot into this context. Together with the practice of

⁴⁶) The same idea is said to be expressed in an earlier work, *To Nicoteles* (2), 14: "It is monstrous that the worse should rule the better, and that the more foolish should give orders to men of greater wisdom". This too is cited as an allusion to the two equalities by Norlin in his note (Loeb Isocrates II, 116, note b). But it is vague in the extreme – more so than the *Nicoles*: the very word "equality", which is the whole point of the theory, does not even occur. It is merely a common aristocratic grumble, akin to those of the Old Oligarch.

⁴⁷) ISOCR., 7 (*Areop.*) 21–22; the translation is again that of Norlin, Loeb Isocrates, II 117.

⁴⁸) cf. pp. 120–123.

⁴⁹) Pl., *Laws* 757 B 5; p. 108.

voting, which entails the counting of heads, it is, of course, the most obvious example of the practical application of arithmetical equality. The *Areopagiticus* is generally dated between 360 and 354⁵⁰); the *Laws* presumably appeared soon after 347, the year of Plato's death. Yet I find it hard to believe that the new detail is to be attributed to Isocrates – not on the grounds that Isocrates was incapable of an original thought, but because when a writer takes over a theory and states it briefly and generally, it is not likely that he will make a small but important innovation of this nature. This observation, if correct, might provide support for those who believe in an earlier version of the *Laws* used by Aristotle⁵¹). Alternatively, if the *Laws* is simply a record of what Plato had been urging in lectures and conversation for many years, Isocrates may perhaps have heard of it in that way. A third possibility, of course, is a common source, now lost⁵²).

(vi) Aristotle

It is in Aristotle's *Politics* that the theory is discussed at greatest length. It is much to Aristotle's credit that he saw some of its inadequacies, but, in my view, he did not go nearly far enough: he failed to see the force of his own criticisms. It is perhaps best to take each passage as it occurs in the *Politics*.

"The first thing to note is what marks men give of oligarchy and democracy, and what are oligarchic and democratic justice.

All men grasp justice to some extent; but they only go part of the way, and they do not state the whole of the absolutely just. For example, justice is thought to be equality; and so it is, but for equals, not for everybody. Inequality is also thought to be just; and so it is, but for unequals, not for everybody. They omit the "for whom" and

⁵⁰) Usually 356 or 355; early 354, Mathieu, Budé Isocrates III, 56; perhaps late 357, W. JAEGER, *H.S.C.P.* Suppl. Vol. 1 (Athenian Studies presented to W. S. Ferguson), 439 (see pp. 409–39).

⁵¹) G. R. MORROW *Aristotle's Comments on Plato's Laws*, in *Aristotle and Plato in the Mid-fourth Century*, ed I. Düring and G. E. L. Owen (Göteborg, 1960), 145–62, esp. 160–2. Morrow does not attempt to date this earlier version.

⁵²) Archytas, even?

judge badly. That is because they are judging about themselves. Most men are bad judges in their own cause.

Justice is relative to persons, and requires the same ratio for the persons as for the things, as was said earlier in the *Ethics*. Men admit the equality of the things but dispute that of the persons. This is mainly because, as just mentioned, they judge badly in their own affairs, but also because each side is really saying something true about justice and hence thinks it is saying the whole truth. The one party, being unequal in some respect, as possessions, thinks itself wholly unequal. The other party, being equal in some respect, as freedom, thinks itself wholly equal⁵³).

Here Aristotle views the theory as a theory about justice, rather than about the narrower issue of constitutional rights; in this he is at one with Archytas⁵⁴). But constitutional rights are of course included.

"Justice is thought to be equality": this is the democratic point of view, as Aristotle says later⁵⁵). "And so it is", he adds, "but for equals, not for everybody". There may be a certain amount of truth behind what Aristotle is trying to say; but his terminology is highly misleading. Justice involves equality: that is, everybody is to be treated as equal, unless good grounds can be adduced in a particular instance to justify an inequality – a privilege or a curtailment of rights. This does not, of course, imply that some men are naturally better than others; on the contrary, it denies it; but that view is inextricably bound up with Aristotle's terminology. "Inequality is also thought to be just": this is the oligarchic point of view, as Aristotle says later⁵⁶). "And so it is, but for unequals, not for everybody". Here again one must complain that to speak of "unequals" is to mislead; for it implies some sort of grading of human beings. "Equality (or inequality) of the persons" is distressingly off the point: for this suggests that the whole question is an empirical matter, whereas it is a decision about procedure which rests on a moral belief about human rights. And this flaw

is fundamental to Aristotle's reasoning. Certainly, inequalities, or perhaps we should say "differences", *are* taken into account in justice; but only those relevant to the particular matter in hand.

Aristotle does however realise the uselessness of claims to equality and inequality which are made in the air: the important question, as he sees it, is to discover what kinds of inequality (or differences) entitle a man to what kinds of inequality (or differences) of treatment. Aristotle's answer is that it is those who "contribute most to political society" (οἱ συμβάλλοντες πλεῖστον εἰς τὴν τοιαύτην (i.e. πολιτικὴν) κοινωνίαν) who are entitled to a larger share in the city⁵⁷). But this reply suffers from two vaguenesses. (i) It is not at first clear which qualities are to count as contributing to political society; so that Aristotle's answer would not settle the rival claims of, for instance, a rich man and a wise man and a brave man (not that such men can be so neatly distinguished except in theory). This is a question which Aristotle later attempts to answer⁵⁸). (ii) It is not clear how this entitlement to a larger share in the city is to work out in practice: what are these privileges? If, as seems likely, they are political offices, then on what principles are they to be measured out, divided, and shared round?

Aristotle seems to be tentatively feeling his way towards formulating the principle of relevance; but he does not reach it in this discussion. A later account which he gives, however, does go as far as to point out the inadmissibility of some of the qualifications which were alleged in his day to be relevant to political distinctions.

⁵⁷) ib. 1281 A 4 ff.

⁵⁸) pp. 115–116. In the course of an interesting discussion of this passage, R. Robinson (*Aristotle's "Politics", books III and IV*, 31–3) answers this question as follows: "In 1280 B 5 political goodness looks like good character and good behaviour towards the city and its laws and citizens. In 1281 A 7 it looks like the power to produce good character and good behaviour in the other citizens. The latter is probably Aristotle's idea: political goodness is being good at making men good by ruling them" (p. 31). If this interpretation is right, then this is the quality which is to count as "contributing to political society"; but we still do not know how it is to be measured or assessed; and my second objection (p. 13) still holds good. And there is the further objection that one cannot avoid having doubts about men who are "good at making men good by ruling them": what sort of people would they be? Aristotle's fundamental political principle is involved, and this is misguided (Robinson, *op. cit.* xvii–xxviii, esp. xxii–xxv).

⁵³) Ar. *Pol.* 1280 A 7 25, trs. R. Robinson (Oxford, 1962), 28.

⁵⁴) DK 47 B 3.

⁵⁵) Ar. *Pol.* 1301 A 29; 1317 B 2 10; 1318 A 3–8. These passages are quoted on pp. 117 and 119.

⁵⁶) Ar. *Pol.* 1301 A 31.

"All men hold that justice is some kind of equality; and up to a certain point they agree with what has been determined in our philosophical discussions on ethical matters. That is, they say that justice is a certain distribution to certain persons, and must be equal for equals. What we have to discover is equality and inequality of what sort of persons. That is difficult, and calls for political philosophy.

Perhaps someone would say that superiority in any good whatever deserves inequality in the assignment of offices, provided that in all other respects the men do not differ but are alike, on the ground that whoever differs has a different right and worth. But if this is true, complexion and height and any good whatever entitle those who excel in it to an excess of political rights. But is this not obviously false"⁵⁹?

Here then Aristotle uses the relevance principle; but it should have been used in the previous argument too⁶⁰). He even goes some way towards formulating it: "What we have to discover is equality and inequality of what sort of persons". Aristotle answers his question with an example from flute-playing⁶¹) which is very much to the point; but his conclusion is disappointing:

"It is clear that in politics also it is reasonable not to claim office on the ground of any and every inequality. . . . The claim must be based on a difference in something that helps to constitute a city. Hence it is reasonable for the noble and free and rich to claim the honour, because the citizens must be free and have taxable property; a city could not consist entirely of needy persons, any more than of slaves. And, if those attributes are necessary, evidently justice and political goodness are necessary too. Without these, also, a city cannot go on. Or, rather, without the former, it cannot exist, and without these it cannot go on well"⁶²).

This conclusion contradicts Aristotle's previous arguments. If *τιμή* here means political power, as it clearly does, what relevance has good birth? None whatever, as Aristotle would have seen if he had followed his reasoning to the conclusion which it demands, instead of

abandoning it half way. What relevance has wealth? The rich pay taxes, says Aristotle; but why is this a good reason for giving them more political power than, say, a poor sailor, who can also claim to serve the state by fighting for it? Aristotle has grasped the point that differences between men, and inequalities in the state, must both be taken into consideration; he realises that these must be related to each other in a reasonable and relevant way. Why then this blindness, this lack of rigour in Aristotle's argument? Because, no doubt, his mind was so accustomed to thinking of birth and wealth as entitling a man to power that, despite his own arguments, he did not stop to question them. In many Greek states this was an accepted fact of political life. Aristotle's practical conclusions were at variance with his abstract arguments; if we want to pass a harsher judgement, we might say that his prejudice obscured the force of his own logic.

Little remains to be said about Aristotle's further remarks on the attitudes of democrats and oligarchs towards justice; but the relevant passages should be quoted.

"We must first assume the starting point, that many forms of constitution have come into existence with everybody agreeing as to what is just, that is proportionate equality, but failing to attain it . . . Thus democracy arose from men's thinking that if they are equal in any respect they are equal absolutely (for they suppose that because they are all alike free they are equal absolutely), oligarchy arose from their assuming that if they are unequal as regards some one thing they are unequal wholly (for being unequal in property they assume that they are unequal absolutely); and then the democrats claim as being equal to participate in all things in equal shares, while the oligarchs as being unequal seek to have a larger share, for a larger share is unequal. All these forms of constitution then have some element of justice, but from an absolute point of view they are erroneous; and owing to this cause, when each of the two parties has not got the share in the constitution which accords with the fundamental assumption that they happen to entertain, class war ensues. And of all men those who excel in virtue would most justifiably stir up faction, though they are least given to doing so; for they alone can with the fullest reason be deemed absolutely unequal. And there are some men who

⁵⁹) *Ar. Pol.* 1282 B 18-30, (trs. R. Robinson (p. 41).

⁶⁰) *ib.* 1280 A 7-25.

⁶¹) *ib.* 1282 B 30-1283 A 3.

⁶²) *ib.* 1283 A 10-22, (trs. R. Robinson (p. 42).

being superior in birth claim unequal rights because of this inequality; for persons who have ancestral virtue and wealth behind them are thought to be noble"⁶³).

The importance of this passage is that it tells us that equality was the watchword of democrats, and inequality of oligarchs. Not, of course, that oligarchs would have said openly "Inequality is a splendid thing" – the whole theory of geometric proportion is a subtle attempt to avoid doing just that, an attempt to call inequality "true equality" – but rather that their practice presupposes such an attitude. No-one could defend inequality, because the word *ἰσόν* meant "fair" as well as equal; and no-one would boast of an unfair system⁶⁴).

So far, Aristotle has not explicitly mentioned geometric proportion, still less its mathematical basis. But it is clear that this has been in the background all the time: it lies behind the whole notion of equality proportionate to the worth of the person. It is made explicit in a later passage, which arises from a discussion of *stasis*⁶⁵):

"For party strife is everywhere due to inequality, where classes that are unequal do not receive a share of power in proportion . . . ; for generally the motive for factious strife is the desire for equality. But equality is of two kinds, numerical equality and equality according to worth – by numerically equal I mean that which is the same and equal in number or dimension, by equal according to worth that which is equal by proportion; for instance numerically 3 exceeds 2 and 2 exceeds 1 by an equal amount, but by proportion 4 exceeds 2 and 2 exceeds 1 equally, since 2 and 1 are equal parts of 4 and 2, both being halves. But although men agree that the absolutely just is what is according to worth, they disagree (as was said before) in that some think that if they are equal in something they are wholly equal, and others claim that if they are unequal in something they deserve an unequal share of all things. Owing to this two principal varieties of constitution come into existence, democracy and oligarchy; for noble

birth and virtue are found in few men, but the qualifications specified in more: nowhere are there a hundred men nobly born and good, but there are rich men in many places. But for the constitution to be framed absolutely and entirely according to either kind of equality is bad. And this is proved by experience, for not one of the constitutions formed on such lines is permanent. And the cause of this is that it is impossible for some evil not to occur ultimately from the first and initial error that has been made. Hence the proper course is to employ numerical equality in some things and equality according to worth in others"⁶⁶).

It is interesting that Aristotle says that it is bad for the constitution to be framed entirely according to either kind of equality; Plato had foreseen practical difficulties⁶⁷), but Aristotle's position is a long way from his exalted view of geometric proportion as "God's choice", and as having "the greatest power among gods and men"⁶⁸). Why has Aristotle stepped down? Most probably it is a natural reaction from Plato in the light of experience⁶⁹). Or perhaps the theory of geometric proportion had been subjected to such cogent attack from the democrats that Aristotle could no longer put it forward with the complete confidence of his master.

The last references to the theory in the *Politics* occur in book 6, where Aristotle shows that the principle of equality, or arithmetic equality, as he calls it, is the basis of democracy:

"But one factor of liberty is to govern and be governed in turn; for the democratic principle of justice is to have equality according to number (*τὸ ἰσὸν ἔχειν κατ' ἀριθμὸν*), not worth, and if this is the principle of justice prevailing, the multitude must of necessity be sovereign and the decision of the majority must be final and must constitute justice, for they say that each of the citizens ought to have an equal share; so that it results that in democracies the poor are more powerful

⁶³) *ib.* 1301 A 26–B 4, *trs.* H. Rackham (Loeb), pp. 371–3.

⁶⁴) Cf. the remark of K. J. Dover, in *The Political Aspect of Aeschylus' "Eumenides"*, *J. H. S.* lxxvii (1957), 233: "Democrats do not boast of their ἀναρχία, nor do oligarchs claim to impose δουλεία".

⁶⁵) Cf. ARCHYTAS, DK 47 B 3; *Pl. Laws* 757 A, 744 C.

⁶⁶) *AR. Pol.* 1301 B 27–1302 A 8, *trs.* H. Rackham (pp. 375–7). Compare the working-out with that of Archytas, DK 47 B 2.

⁶⁷) *Pl. Laws* 757 E.

⁶⁸) *ib.* 757 *passim*; *Gorg.* 508 A.

⁶⁹) *AR. Pol.* 1302 A 4.

than the rich, because there are more of them and whatever is decided by the majority is sovereign"⁷⁰).

He makes the same point again later:

"But what is thought to be the extreme form of democracy and of popular government comes about as a result of the principle of justice that is admitted to be democratic, and this is for all to have equality according to number (τὸ ἴσον εἶναι πάντας κατ' ἀριθμὸν). For it is [true] equality⁷¹ for the poor to have no larger share of power than the rich, and not for the poor alone to be supreme but for all to govern equally"⁷²).

(vii) *Plutarch and the retrojection of the theory*

We have seen how Isocrates attributed geometric proportion to the "good old days" of early Athens⁷³. These "good old days" were the

⁷⁰ *ib.* 1317 B 2-10, trs. H. Rackham (slightly changed), pp. 489-91.

⁷¹ In other words, geometric proportion.

⁷² *Ar. Pol.* 1318 A 3-8, trs. H. Rackham, p. 493. κατ' ἀριθμὸν at the end of this sentence (line 8) is rightly excised by Rackham; it has come in from line 5, and makes nonsense of the passage. Ross however prints it, without comment; so does Newman.

I do not wish to embark here on a discussion of the difficult passage 1318 A 3-B 5 (rejected by some as spurious). But I suspect that it is in fact an attempt to put geometric proportion into practice, and that the puzzling phrase τὴν κατὰ τοῦτο ἰσότητά (1318 A 14), translated by Newman (IV, 504) as "equality in respect of property-qualification", comes to very much the same as "geometric proportion". It is certainly not "equality in proportion to number", i.e. arithmetical proportion (Rackham, 494, note a).

There is also a brief reference to this topic at *Pol.* 1308 A 11-13: "For that equality which men of democratic spirit seek for in the case of the multitude is not only just but also expedient in the case of those who are alike".

For the sake of completeness, it should be added that the whole apparatus, mathematical examples and all, turns up also in the ethical works of Aristotle. I refrain, however, from discussing these passages: they present difficulties of interpretation of their own, and they take us too far afield from our subject. The references are:

E.N. 1131 A 10 B 24 *E.E.* 1238 B 19-21 *E.E.* 1242 B 11-31

E.N. 1158 B 27-33 *E.E.* 1241 B 32-40

M.M. 1193 B 19-1194 A 25, of which only 1193 B 36-1194 A 18 is peculiar to the *M.M.*

The great flaw of regarding the equality of men as some measurable empirical quality (cf. p. 12) makes the elaborate discussion of justice in the *E.N.* practically worthless.

⁷³ *Isocr.* 7 (*Areop.*) 21; p. 111-112.

days of Solon⁷⁴); and it is interesting to see how this notion was elaborated in later antiquity. It need hardly be added that this retrojection of the theory cannot possibly have any basis in historical fact; it must represent later propaganda.

"It is said", wrote Plutarch, "that a remark which Solon had previously made to the effect that 'equality does not create war' was in circulation; and this pleased both those with property and those without; for the former expected to get equality based on worth and excellence (ἀξία and ἀρετή), the latter equality based on measure and number"⁷⁵). Perhaps Solon did declare τὸ ἴσον πόλεμον οὐ ποιεῖ⁷⁶); but the suggestion that the poor expected arithmetical equality, and the upper classes geometric proportion, is of course a fiction, Plutarch repeats the same story elsewhere⁷⁷): "Solon's remark about the state, that equality does not make *stasis*, was thought to be too much in favour of the rabble (ἔχληρος) in introducing arithmetical and democratic proportion instead of the excellent geometric proportion"⁷⁸).

It would be interesting to know what Plutarch's source was. For this is not simply Isocratean propaganda; it is its very opposite. For Isocrates, the Solonian constitution was an example of geometric proportion; for Plutarch's source it was arithmetical equality: those of Solon's supporters who wanted geometric proportion were greatly disappointed. It is not difficult to see the origin of the discrepancy. Isocrates believed that Solon instituted, not the radical democracy of the fourth century, but the "good old democracy" – in other words, not a democracy at all: hence geometric proportion. Plutarch's source, on the other hand, believed that Solon was the founder of the democracy; so arithmetical equality is appropriate. It throws a bright light on the practical value of these theories that the two opposite and

⁷⁴ *ib.* 16.

⁷⁵ *Plut. Sol.* 14.4.

⁷⁶ Solon did of course believe in a "balanced" state (e.g. frs. 5, 25 Diehl); τὸ ἴσον here might mean something like a "balance" between the claims of the two sides.

⁷⁷ *Plut. Mor.* 484 B (*de frat. amore*).

⁷⁸ Note the variant: equality does not make πόλεμος (*Plut. Sol.* 14.4); it does not make *stasis* (here; cf. Archytas DK 47 B 3; *Pl. Laws* 757 A, 744 C; *Ar. Pol.* 1301 A 39, B 26 ff.). This is an indication that Plutarch quotes from memory, rather than that he had two sources.

incompatible equalities could both be thought of as symbolizing the same constitution⁷⁹).

Equally unhistorical is Plutarch's attribution of the theory to Lycurgus. "Plato combined Lycurgus, no less than Pythagoras, with Socrates, as Dicacarchus believed. For, you know, Lycurgus expelled arithmetical proportion from Sparta, as being democratic and favourable to the rabble (*δολικὸς*), and introduced geometric proportion, which is suited to sober oligarchy and law-abiding kingship. For the former distributes equality by number, while the latter distributes what a man deserves by proportion (*ἡ μὲν γὰρ ἀριθμῷ τὸ ἴσον, ἡ δὲ λόγῳ τὸ κατ' ἀξίαν ἀπονέμει*); it does not mix everything up together <unlike arithmetical equality>, but it makes a clear distinction between the good and the bad; it is not by means of an even balance, nor even by means of the lot that they receive their share, but they get what befits them in accordance with how much they differ in virtue and vice. God applies this proportion to things, my dear Tyndares; it is called *dikē* and *nemesis*, and it teaches us that we should make justice *ἴσον* (fair?), but not make equality just; for God destroys as far as possible the equality which the majority pursue, which is the greatest of all injustices, but he preserves equality according to worth, distinguishing geometrically the lawful by the proportionate"⁸⁰).

This, with its allusion to Lycurgus, is no more than fanciful antiquarianism; but it has not been forgotten that the theory is in origin Pythagorean. There is, of course, not a scrap of evidence elsewhere that the political application of the proportions had anything to do with Pythagoras himself: we can quite safely ignore both Pythagoras and Lycurgus in this context. Chronology, we observe, has gone for nothing: if it is Pythagorean, how does Lycurgus come to know all about it? We may note that geometric proportion is again associated

⁷⁹ This is because the two authors held opposite and incompatible views about the Solonian state. But neither Isocrates nor Plutarch's source approved of democracy; so much is clear from their use of the theory of geometric proportion; for it is a built-in characteristic of that theory that whenever it makes an appearance, geometric proportion is bound to win.

⁸⁰ *Plut. Mor.* 719 A. C. (*Quest. conviv.* 8,2,2).

with the God's-eye view⁸¹); and that arithmetical equality, as always, is explicitly connected with democracy, and geometric proportion with a non-democratic constitution.

(viii) *The later history of the idea*

At the tail-end of antiquity, we find the idea expounded by Boethius, in a section of his work on arithmetic called "*Quae medietates quibus rerum publicarum statibus comparentur*". But here something remarkable has happened.

"And so arithmetical proportion is compared to a state which is governed by a few, because there is a greater ratio between its lesser terms (i.e. 6 is $1\frac{1}{2}$ times 4; but 4 is twice 2, a greater ratio). But they say that harmonic proportion is the state governed by the *optimates*, because the greater ratio is found in its greater terms (i.e. 6 is $1\frac{1}{2}$ times 4; but 4 is $1\frac{1}{3}$ times 3, a lesser ratio). Geometric proportion is the proportion of a somehow democratic and equalized state. For it is composed of an equal ratio of all, of both greater and lesser terms, and there is a parity between all which consists of a proportion which retains an equal justice in its ratios (i.e. 8 is twice 4; and 4 is twice 2)"⁸².

This is extraordinary: the whole meaning of the theory has been changed. But a little reflection will show that it is not, as might be supposed, totally bogus: the new interpretation leaves the mathematical respectability of the theory unimpaired. According to Boethius, in the arithmetical proportion, the men of the least worth, arbitrarily equated by the writer with an oligarchy, get most power. In the harmonic proportion, the men of the greatest worth get most power. And in the geometric proportion, all, whatever their worth, get

⁸¹ As at *Pl. Laws* 757 B.

⁸² *Boethius Arithm.* 2.45: *Atque ideo arithmetica quidem rei publicae comparatur, quae paucis regitur, idcirco quod in minoribus eius terminis maior proportio sit, musicam vero medietatem optimatum dicunt esse rem publicam ideo, quod in maioribus terminis maior proportionalitas invenitur, geometrica medietas popularis quodammodo et exaequatae civitatis est, namque vel in maioribus vel in minoribus aequali omnium proportionalitate componitur, et est inter omnes paritas quaedam medietatis aequum ius in proportionibus conservantis.* (Passages in brackets in the translation are not, of course, in the text).

equal power. For Boethius, then, arithmetical proportion is oligarchy, harmonic proportion is the rule of the *optimates*; and geometric proportion is democracy⁸³). But for the classical age, arithmetical proportion was democratic, and geometric proportion was undemocratic, a graded society of increasing and decreasing privilege. Boethius is able to turn this mathematical somersault by means of ignoring the distance between each number and its neighbour, which the classical theory took into account, and using only the values of the numbers, and the ratios between them.

But Boethius does not stand alone: Stobaeus quotes an author who gives both the same heterodox interpretation of the proportions, and the same mathematical explanation⁸⁴):

"Wherefore some make justice aristocratic, some democratic, and some oligarchic: aristocratic justice is according to the subcontrary mean: for this proportion distributes greater ratios to greater, and less to less. Democratic justice is according to the geometric proportion: for in that the ratios of greater and smaller amounts are equal. Oligarchic and tyrannic justice is according to the arithmetical proportion: for this is the opposite of the subcontrary: it distributes greater ratios to less, and less to greater. These, then, are the forms (*ιδέαι*) of the distribution, but the imitations (*εἰκόνες*) are seen in constitutions and households: for rewards and punishments and offices are either distributed equally to greater and less, or unequally,

⁸³) What, it might be asked, is the difference between oligarchy and the rule of the *optimates*? The mathematical working-out shows that the distinction is between the rule of any few men – any old oligarchy – and that of the few who deserve to rule, the *optimates*. This interpretation is borne out by the pseudo-Archytas fragment (p. 124-125).

⁸⁴) STOBÆUS 4,1,137: διὸ τὸ δίκαιον τοὶ μὲν ἀριστοκρατικὸν τοὶ δὲ δημοκρατικὸν τοὶ δὲ ὀλιγαρχικὸν ποιοῦντι· καὶ τὸ ἀριστοκρατικὸν κατὰ τὸν ὑπεναντίαν μεσότητά· τοῖς μὲν γὰρ μέζουσι μέζοντας τὼς λόγως, τοῖς δὲ μῆσοι μῆκρας διανέμει ἡ ἀναλογία αὐτὰ· τὸ δὲ δημοκρατικὸν κατὰ τὴν γεωμετρικὴν· ἐν γὰρ ταύτῃ τοὶ λόγοι ἴσοι τῶν μεζόνων καὶ μῆκων μεγέθεων· τὸ δὲ ὀλιγαρχικὸν καὶ τυραννικὸν κατὰ τὴν ἀριθμητικὴν· ἀντιτάζει γὰρ αὐτὰ τῇ ὑπεναντίᾳ· τοῖς γὰρ μῆσοι μέζοντας τὼς λόγως, τοῖς δὲ μέζουσι μῆκρας. καὶ μὲν ὦν ἰδέαι τῶς διανομῆς τασαύται, καὶ δὲ εἰκόνες ἐν ταῖς πολιτείαις καὶ τοῖς οἰκίαις θεωροῦνται· τιμαὶ τε γὰρ καὶ κολάσεις καὶ ἀρχαὶ <ἧ> ἐξ ἴσου τοῖς μέζουσι καὶ μῆσοι διανέμονται, ἧ ἐξ ἀνίσου ἢ τῷ ἀρετῇ ὑπερέχεν ἢ τῷ πλοσότη· ἢ καὶ δυνάμει. τὸ μὲν ὦν ἐξ ἴσου δημοκρατικόν, τὸ δὲ ἐξ ἀνίσου ἀριστοκρατικὸν ἢ ὀλιγαρχικόν.

through superiority in *aretē* or riches or power. That then which distributes equally is democratic, that which distributes unequally, aristocratic or oligarchic".

Who is this author? If we take Stobaeus' word for it, he is none other than Archytas himself. If this is true, it would be most startling. Are we to suppose that this is pure Archytan doctrine, that Plato, Isocrates, Aristotle and Plutarch all got it wrong, and that Boethius is the only trustworthy exponent of an uncorrupted philosophical tradition which comes to him straight from the early fourth century B.C.⁸⁵) Surely not. It is *a priori* implausible; and the whole weight of the evidence goes against it. The fragment cannot be the work of Archytas⁸⁶).

How can we account for the Boethius and pseudo-Archytas passages? Someone has obviously tried to revive the old theory; but, clearly, either he is ignorant of its classical application, and has worked it out for himself, with startling new results; or else it is a deliberate re-interpretation. The latter seems more likely. But who was responsible for it? Not Boethius himself: the use of *dicunt*⁸⁷) shows this. Nor pseudo-Archytas: the use of *ποιοῦντι*⁸⁸) shows this. Boethius does not translate straight from pseudo-Archytas, nor vice-versa: this is shown by the fact that they discuss the proportions in a different order. There must be a common source. *Dicunt* and *ποιοῦντι*, both plurals, suggest that more than one author had developed the new interpretation. The author's political views can be detected from his theory. Harmonic proportion was thought to be better than geometric, as geometric was better than arithmetical. The originator of the new application must therefore have believed that the rule of the best was most desirable; second on his list came democracy; and worst of all,

⁸⁵) If this fragment represents Archytas' views, then Archytas himself must have got the theory wrong when he wrote DK 47 B 3, if our interpretation (pp. 105-106) is correct.

⁸⁶) It has often been condemned as spurious on other grounds. This passage, with others also attributed to Archytas by Stobaeus, is discussed in more detail in part II, pp. 131-138, where the grounds for rejecting them are stated in full.

⁸⁷) Boethius, line 4 of the quotation in n. 82.

⁸⁸) ps.-Archytas, line 2 of the quotation in n. 84.

the rule of a few. A strange outlook. I must confess that I am unable to go any further than this⁸⁹).

The theory of geometric proportion had a long life. One late echo, and we will have finished with it: some lines from Johannes Tzetzes, the twelfth-century grammarian, on the words inscribed over Plato's door⁹⁰):

πρὸ τῶν προθύρων τῶν αὐτοῦ γράψας ὑπῆρχε Πλάτων·
 Μηδεὶς ἀγεωμέτρητος εἰσέτω μου τὴν στέγην·
 τοῦτέστιν, ἄδικος μηδεὶς παρεισερχέσθω τῆδε·
 ἰσότης γὰρ καὶ δίκαιον ἐστὶ γεωμετρικόν⁹¹).

(ix) Criticisms

In dealing with this topic, I have made certain criticisms of the theory of geometric proportion. To conclude the first part of this paper I would like to recapitulate these, and to add a few more.

In the first place, no Greek democrat would have said that he believed in arithmetical proportion; he just believed in equality pure and simple, equal rights, equality before the law, and so forth. It is the opponents of democracy who interpreted these values as arithmetical proportion: in place of the democratic ideal they substituted a scale – something entirely different, and indeed opposed to the

⁸⁹) Two negative points. The theory was known to Plutarch in its original form. But it is not safe to infer a date between the first and sixth centuries A.D. for the new version. It may be that the new interpretation was current in Plutarch's day, and that Plutarch either had not heard about it, or preferred to ignore it for the purposes of his anecdote about Solon. I suggest (part II, p. 28, n. 18) a date in the first century A.D. for Diogenes, Sthenidas and Ecphantus: should perhaps a similar date be given to pseudo-Archytas? There are certain close similarities in thought between all these authors (part II p. 133, n. 119).

Nor can anything be deduced from the surprising order in which Boethius presents the proportions: arithmetical, harmonic, geometric. They are not in the order of their merit, as can be seen by a comparison with ps.-Archytas' account. Perhaps, having stated the basic proportion, the arithmetical, Boethius then jumps to the harmonic because it is the one that interests him most as a musician.

⁹⁰) Tzetzes *Hist. var. chiliades* 8, 972-5.

⁹¹) I refrain from pursuing the topic through the pages of the mathematicians and musical theorists, where the arithmetical, geometric and harmonic proportions are often fully treated, but not given a political meaning. See NICOMACHUS OF GERAESA *Arithm.* 2,21-25; 2,28,6; BOETHIUS *Mus.* 1,10, 2,12, 2,14. Of these, Boethius 2,12 succeeds in making the somewhat complex theory extremely clear.

notion of equality in its simple form. Once this distortion had been allowed to creep in, then it was an easy step to elaborate, and to introduce the "superior" geometric proportion. "Democratic arithmetical proportion" is, then, a concept introduced by anti-democrats; it is what they said that democrats believed in; but it is not what democrats did believe in. This is clear enough from the fact that by itself the concept of "democratic arithmetical proportion" is pointless; it only makes sense in the context of the comparison with the non-democratic geometric proportion. The theory is based on putting into the mouths of democrats views which they never held.

Furthermore, the principle that those with special abilities should be given jobs where they could make use of them – which is one of the ideas behind geometric proportion – was in fact at all times recognized at Athens, as Pericles claimed⁹²). At no time were the most important offices of state entrusted to the lot, that example *par excellence* of arithmetical proportion. The opponents of democracy were insisting on something which no democrat at Athens ever denied. But democrats never clothed their ideas in mathematical trappings. They insisted on certain qualifications for the more specialized jobs (as opposed to mere attendance at the council and assembly): generals were elected, so that experienced men led the Athenian army; there was a property-qualification for the post of *tamias*, so that if he took money, it could be recovered; and so forth. These were particular qualifications for particular offices with particular justifications: no general theory was framed, but ability and merit were not overlooked.

Again, the translation of the mathematical basis of the theory into political terms is valueless, since it can be adapted with no difficulty to suit two radically different evaluations of constitutions, the "classical" application, and that of Boethius and pseudo-Archytas. The general idea behind the theory, that men should have power in proportion to their worth, is also valueless. It is too vague. Plato makes Socrates use geometric proportion against Callicles⁹³); yet Callicles himself uses the idea on which geometric proportion rests: "it is just", he says,

⁹²) TH. 2,37,1, cited on p. 102; cf. PS.-XEN. *Ath. Pol.* 1,3 (distorted).

⁹³) PL. *Gorg.* 508 A.

"that the greater should have more than the less, and the stronger than the weaker"⁹⁴). The phrase links in one Callicles' "immoralism" and the very words most characteristic of geometric proportion. The theory is thus too adaptable: it can be used on one side or the other with equal effect; it can even be called in to justify absolute monarchy⁹⁵).

To represent the equality of the democrats in numerical terms is to misunderstand a claim about the way in which people ought to be treated as an empirical statement about what people are; and the doctrine of geometric proportion also ignores the criterion of relevance. Briefly, this is: every difference in treatment must be justified, not by any difference between the men treated, but by a relevant difference. Most of the supporters of the principle of geometric proportion failed to take this into account. Aristotle did take it into account; but we may have serious doubts about his "political goodness". He pushes the problem back one stage further: what constitutes "political goodness"?

Finally: it is all very well to say that one man is "better" than another; but who is to decide this? Not the men themselves: *οἱ πλείστοι φαῦλοι κριταὶ περὶ τῶν οὐκείων*⁹⁶). Or, as Popper says: "Against all this anti-equalitarianism, I hold, with Kant, that it must be the principle of all morality that no man should consider himself more valuable than any other person. And I assert that this principle is the only one acceptable, considering the notorious impossibility of judging oneself impartially"⁹⁷). The individual cannot judge himself, then; nor is anyone else, or any group, in a position to give a verdict on such a question. No group of men "known to be good" can decide; for an infinite regress is set up: who is to decide who *these* men are? So the evaluation and grading of citizens which the theory of geometric proportion requires is an impossible task.

The attempt of the opponents of democracy to discredit the demo-

⁹⁴) *ib.* 583 E.

⁹⁵) ISOCR. 3 (*Nic.*), 14-16.

⁹⁶) AR. *Pol.* 1280 A 16.

⁹⁷) K. R. POPPER *The Open Society and its Enemies*² (London, 1957), I 256, n. 20.

crats' principle of equality by the introduction of a "superior" form of equality is thus a complete failure⁹⁸).

II GEOMETRIC AND HARMONIC PROPORTION IN ARCHYTAS AND PLATO

In two recent articles⁹⁹), Mr. J. S. Morrison has maintained that Plato abandons geometric proportion in the *Republic* and adopts instead a third kind, harmonic proportion. He argues as follows¹⁰⁰):

"I noticed, when the theory of justice or social order put forward in the *Republic* was being considered, that it differed from the theory mentioned briefly in the *Gorgias*. In the latter dialogue the formula which is the basis of social and physical order is geometric proportion . . . The bond of unity in the *Republic* is the harmonic *isotes* . . . We are told that Pythagoras discovered the theory of means (Iambl. *in Nic.* p. 100, 19 ff. (Pistelli) [= DK 18.15]), and knew of three, the arithmetic, geometric, and sub-contrary, but that the third was named harmonic by Archytas and Hippiasus. In a fragment of Archytas' work on music the three proportions are defined and the third is described as "the subcontrary which we call harmonic". These facts suggest very strongly that Plato's acquaintance with Archytas was the cause of his adoption of the harmonic proportion as the bond of unity in soul and state in the *Republic*.

⁹⁸) There are some striking resemblances between geometric proportion and what is known as "dominance hierarchy" among baboons (for a popular account, see S. L. WASHBURN and I. DeVORE *The Social Life of Baboons*, *Scientific American*, June 1961, 62-71, esp. 69-70, from which the quotations that follow are taken). "The most dominant males will be more frequently groomed and they occupy feeding and resting positions of their choice": the best receive honours and privileges *κατ' ἀξίαν*; equality for equals, inequality for unequals. "When a dominant animal approaches a subordinate one, the lesser animal moves out of the way": contrast the state of affairs in a democracy (where arithmetical proportion prevails) - people and even animals are always bumping into you in the street (Ps.-XEN. *Ath. Pol.* 1, 10, Pl. *RP* 563 C). "The hierarchy has considerable stability . . . The usual effect of the hierarchy . . . is to decrease disruptions in the troop": geometric proportion prevents *stasis* (Archytas DK 47 B 3; Pl. *Laws* 757 A, 744 C; AR. *Pol.* 1301 A 39, B 26 ff.; PLUT. *Mor.* 484 B (*de frat. amore*)). "Although dominance depends ultimately on force, it leads to peace, order and popularity": *homonoia* (ARCHYTAS DK 47 B 3) and *φύσις* (Pl. *Laws* 757 A).

⁹⁹) J. S. MORRISON *Pythagoras of Samos*, *C.Q.* n.s. vi (1956), 135-56; "The Origins of Plato's Philosopher-Statesman", *C.Q.* n.s. viii (1958), 198-218.

¹⁰⁰) *C.Q.* n.s. viii (1958), 213-5. The same arguments may be found in the earlier article, *C.Q.* n.s. vi (1956), 154-6, where the political fragments of Archytas are also used as evidence (see pp. 131-138).

Not only did he [i.e. Archytas] employ the name harmonic among the first, but in a work on mathematics he gives an interesting account of the social application of such *logismoi* (DK 47 B3)."

The passages in the *Republic* which are alleged to reflect these ideas are 432 A¹⁰¹) and 443 D. This theory also entails that the *Gorgias* was written before Plato visited Sicily.

I do not find Morrison's hypothesis at all persuasive, for the following reasons:

1. *Archytas did not invent the term »harmonic proportion«*

The third kind of proportion was not only known before Archytas¹⁰²); it was also, according to Iamblichus, called "harmonic" before Archytas by Hippasus, an early Pythagorean¹⁰³). Furthermore, Philolaus is said by Nicomachus¹⁰⁴) to have given a reason for this name. Philolaus was a contemporary of Socrates¹⁰⁵); if Nicomachus is right, this implies that the term was in use before Philolaus' time, and thus well before Archytas. And although Archytas speaks in one place¹⁰⁶) of "the subcontrary, *ἐν καλοῦμεν*¹⁰⁷) *ἀρμονικάν*", he refers to it in the same fragment¹⁰⁸) as "the subcontrary, *ἐν καλέοντι ἀρμονικάν*". Thus there is no need to suppose that Plato must have learnt about it from a personal meeting with Archytas in Sicily¹⁰⁹).

¹⁰¹) Morrison's reference, 431 D, appears to be a slip.

¹⁰²) As Morrison's quotation from Iamblichus shows, Pythagoras was said to have been familiar with it. Iamblichus elsewhere (*in Nic.* 118.23 = DK 44 A 24) says that it was a Babylonian discovery and that Pythagoras was the first to introduce it into Greece. He then gives a list of Pythagoreans who used it: Aristaeus, Timaeus, Philolaus, Archytas, and later Plato in the *Timaeus*.

¹⁰³) Morrison's phrase "among the first" hedges over this. After all, Hippasus and Archytas belong to different centuries. On the date of Hippasus (born c. 500?), see K. von FRITZ *The discovery of incommensurability by Hippasus of Metapontum, Annals of Mathematics* xlv (1945), 245.

¹⁰⁴) NICOM. *Arithm.* 26.2 = DK 44 A 24.

¹⁰⁵) Cf. PL. *Phd.* 61 E.

¹⁰⁶) DK 47 B 2, p. 436 line 9.

¹⁰⁷) "We, the Pythagoreans", not "I, Archytas".

¹⁰⁸) DK 47 B 2, p. 435 line 20.

¹⁰⁹) It is obvious, in any case, that the tradition is confused. Iamblichus' phrase *ἐν τῶν περὶ Ἀρχύταν καὶ Ἰππασίον* suggests that he, writing in the third century A.D., regards these philosophers as contemporaries. If he is mistaken about this, he may also be mistaken in attributing to Archytas the alteration of the name to *ἀρμονική*.

2. *Archytas did not apply the harmonic proportion to politics.*

So far my disagreement with Morrison has been trivial. Even if Archytas did not invent the term "harmonic proportion", it is still possible that it was he who first applied the concept to politics. I believe, however, that there is no clear indication that he did. To prove this it will be necessary to discuss at some length (i) some fragments preserved in the anthology of Stobaeus, which are alleged to be by Archytas, and in which the harmonic proportion is applied to politics: these, I shall argue, are spurious; and (ii) an undisputedly genuine fragment of Archytas (DK 47 B 3): this, I shall argue, does not refer to the harmonic proportion.

(i) *The Authenticity of the Stobaeus fragments*

Stobaeus¹¹⁰) quotes an elaborate application of the three kinds of proportion to politics, which he attributes to Archytas. The text and a translation will be found on p. 124. Many modern writers have wanted to reject this, together with the other political fragments of Archytas¹¹¹) as spurious. But there has been great diversity of opinion on the subject¹¹²). Morrison, in his earlier article, regards them as genuine, concurring with earlier scholars who defended them against the charge

¹¹⁰) STOBÆUS 4.1, 137 (Wachsmuth-Hense: all future references will be to this edition).

¹¹¹) STOB. 4.1, 132, 135 B, 5, 61.

¹¹²) It may be of interest to list the views of previous scholars. Hartenstein (1833) regarded them as authentic, with later interpolations. Gruppe (1840) attributed them to an Alexandrian Jew of the first century A.D. Zeller (1844 etc.) thought that they were the work of neo-Pythagoreans of the first century B.C. Beckmann (1844), according to Morrison, believed them to be genuine. DIELS (1903 etc.) does not print them in his *Fragmente der Vorsokratiker*, and lists them as spurious. ARMAND DELATTE *Essai sur la Politique Pythagoricienne*, (Liège, 1921), where the political fragments of Archytas are most thoroughly discussed, and where the views of Hartenstein, Gruppe and Zeller are reported and criticized) finds no indication that they are late or apocryphal. W. THEILER (*Gnomon* ii (1926), 147-56), reviewing Delatte, regards them as Hellenistic, influenced by Plato and Aristotle, but earlier than Posidonius. He is followed by E. GOODENOUGH ("The Political Philosophy of Hellenistic Kingship", *Tale Classical Studies* i (1928) 55-102). E. L. MINAR (*Early Pythagorean Politics* (Baltimore, 1942), 111) speaks of them as genuine; so, with some doubt, does LOUIS DELATTE (*Les Traités de la Royauté*, etc., (Liège, 1942), 160). T. A. SINCLAIR (*History of Greek Political Thought* (London, 1951), 293, 301) regards them as late productions.

Thus the general opinion is that they are spurious; but there is no unanimity.

of containing Platonic and Aristotelian matter. I will first consider the political fragments as a whole, and then the "proportion fragment" in particular.

All the fragments are written in Doric. A careful examination of the dialect by Armand Delatte¹¹² leads him to the conclusion that it resembles literary Doric of the fifth and fourth centuries B.C., and in particular that of the authentic Pythagorean fragments. But the context might make us suspicious, for Stobaeus also quotes from writings attributed to Diotogenes, Ecphantus and Sthenidas¹¹³, which express ideas similar to those of the Archytas fragments¹¹⁴; and these too are in Doric. Although no agreement has been reached on the date of the Diotogenes, Ecphantus and Sthenidas fragments¹¹⁵, one thing is

¹¹² *op. cit.* (in n. 112), 78.

¹¹³ The omission of these gentlemen from the Oxford Classical Dictionary is rightly castigated by H. LAST, *J.R.S.* xxxix (1949), 194.

¹¹⁴ See n. 119.

¹¹⁵ Louis Delatte (*op. cit.* in n. 112), followed by M. R. CHARLESWORTH (*C.R.* lxi (1949), 22-3), maintained that they belong to the second century A.D. Goodenough and Sinclair (*op. cit.* in n. 112) regard them as Hellenistic. W. W. TARN, "Alexander the Great and the Unity of Mankind", *Proc. Brit. Acad.* xix (1933), 32, n. 33, thinks that Diotogenes has Demetrius Poliorcetes in mind in his description of the ideal king. This view is supported by some very remarkable parallels, both in sense and in phrasing, with Plutarch's life of Demetrius. This shows, Tarn believes, that Diotogenes was contemporary with Demetrius, or very nearly so. If Tarn is right, Sthenidas and Ecphantus should also belong to this period, for they can hardly be separated. Or is Plutarch the source of Diotogenes?

There are also striking parallels between the ideas of these three authors and those of Dio Chrysostom, to which Mr. Oswyn Murray has kindly drawn my attention. The ideas of Dio on kingship are put in this general context by L. Delatte (*op. cit.* in n. 112, 151-2); but the parallels are perhaps closer than is generally realised, and may possibly shed some light on the dating of Diotogenes, Sthenidas and Ecphantus. Thus, the king should be a shepherd of his people, not one who destroys the sheep (Ecphantus ap. Stob. 4.7.64 (vol. 5, p. 276), "Archytas" ap. Stob. 4.5.61; Dio CHRYSOSTOM 1.13.341); he derives his power as a stewardship from Zeus, and governs his people according to Zeus' ordinances, for he is his representative on earth (Diotogenes, Stob. 4.7.62 *ad fin.* (pp. 269-70); Sthenidas, Stob. 4.7.63 (pp. 270-1); Ecphantus, Stob. 4.7.64 (p. 275); Dio 1.45); he is compared with the sun (Ecphantus, Stob. 4.7.64 (p. 272 ff.); Dio 3.73-81). A more careful comparison than I have made would probably reveal further correspondences.

It is, however, difficult to determine whether Dio took his ideas from Diotogenes and the others, or whether they took theirs from him, or whether there is some common source. On general grounds, it seems unlikely that the ideas originated with Dio. If we could safely assume that Diotogenes, Sthenidas and Ecphantus were his source, then Louis Delatte's date (second century A.D.) would have to be

certain: they can hardly be earlier than the Hellenistic period; yet their dialect, and the attribution to Ecphantus, probably a fourth century figure¹¹⁷, show that their author or authors intended them to be taken as fourth-century writings. The political fragments of Archytas thus appear in disreputable company; but then, the same might be said of many of our pre-Socratic fragments whose authenticity is undisputed; and the genuine fragments of Archytas come from the same context.

We must look next at their contents¹¹⁸. The parallels in thought between the political fragments of Archytas and the admittedly late fragments of Diotogenes, Ecphantus and Sthenidas are remarkable¹¹⁹, and they led Goodenough¹²⁰ to regard the former as roughly contemporary with the latter. Louis Delatte¹²¹, too, although he does not believe in a late date for the Archytas fragments, continually cites them in comparison with the thought of Diotogenes, Ecphantus and Sthenidas. On the other hand, Armand Delatte has pointed out a surprising number of parallels with fourth-century thought (the parallels with later writers are, however, more numerous and impressive); these can, of course, be interpreted either as the influence of fourth-century writers (to support a late date), or as a reflection of the common atmosphere of fourth-century thought (to support an early date). But the former seems more probable. Archytas' allusion¹²², in Aristotel-

rejected in favour of something earlier. Why not the first century A.D.? This is suggested by the parallels with Dio and (despite Tarn) Plutarch. (Cf. part I, n. 89). I would not, however, press this conjecture: there may have been a common source; and an earlier date cannot be excluded.

The "Archytas" fragments have much in common with those of Diotogenes, Sthenidas and Ecphantus (see n. 119): should they be given the same date?

¹¹⁷ On his date, see G. S. KIRK and J. E. RAVEN *The Pre-Socratic Philosophers* (Cambridge, 1957), 247 n. 1.

¹¹⁸ Most conveniently summarized in Sinclair, *op. cit.* (in n. 112), 293-4.

¹¹⁹ To take an example: Archytas (Stob. 4.1.135, p. 82 lines 20-1), like Diotogenes (Stob. 4.7.61, p. 263 line 19), says that the king is νόμος ἐμφυλός, and compares νόμος with the sun (Stob. 4.1.138, p. 87 lines 17-20). Ecphantus speaks of the dazzling light of the Godlike king (Stob. 4.7.46, p. 272f.). Cf. also n. 116.

The most useful discussions of the fragments of Diotogenes, Ecphantus and Sthenidas are by Louis Delatte and (with translations) E. Goodenough (*op. cit.* in n. 14).

¹²⁰ *Op. cit.* (in n. 112).

¹²¹ *Op. cit.* (in n. 112).

¹²² Stob. 4.1.135 (p. 83, lines 7-9): τὸ λελυγνὸν ἔχον, τὸ δεικνύν and τὰ πάλαι.

ian terminology, to the Platonic three-part soul, is unlikely to belong to an independent fourth-century philosophical tradition. And his remark *φαμί δὲ ἐγὼ πᾶσαν κοινωνίαν ἐξ ἄρχοντος καὶ ἀρχομένου συνέσταμεν καὶ τρίτον νόμων*¹²³) is almost certainly a correction of the Aristotelian view of a world of natural rulers and natural subjects¹²⁴). It is surely impossible to maintain that such a sentence could be written before Aristotle¹²⁵).

The political fragments of Archytas, then, whatever their date, can hardly be considered to be the genuine work of Archytas the early fourth-century philosopher. They may be purely literary exercises, or they may be forgeries with a political purpose¹²⁶); whatever their origin, they are spurious. True, there are references to oligarchies and democracies; but the polis did not die with Alexander; and in any case these allusions serve only as a background to the main theme, kingship. This emphasis on kingship tells strongly against a fourth-century date. Stobaeus 4,5,61 is entirely concerned with the nature and powers of the true ruler, the ἀλαθινὸς ἄρχων; and there are continual references to kingship in Stob. 4,1,135-8. While the word βασιλεύς is sometimes associated by the author with Sparta¹²⁷), the type of ruler envisaged

¹²³) *ib.* p. 82 lines 19-20.

¹²⁴) *Pol.* I *passim*.

¹²⁵) This suspicion is strengthened by Archytas' use of the Aristotelian phrase ἡ πολιτικὴ κοινωνία (Stob. 4,136, 137 (p. 83 line 16, p. 84 line 9)).

¹²⁶) Charlesworth (*op. cit.* in n. 116) asks what audience the writings of Diotogenes, Sthenidas and Epphantus, in their archaic Doric, were intended to influence, if they are in fact late productions. The same question could be asked of the Archytan fragments, but in both cases it would miss the point. In the ancient world, the respectability of a political doctrine was guaranteed by its antiquity (to make revolution in Greek is νεωτερίζειν), and thus, if one could claim the support of an archaic document, one's case was thereby strengthened. The prestige of Archytas was great; Doric was needed for plausibility.

On the other hand, the fragments might be purely literary productions in the style of Archytas (see Armand Delatte, *op. cit.* in n. 112), which perhaps intentionally, perhaps not, were circulated as genuine.

¹²⁷) Stob. 4,1,138 (p. 85 lines 13, 21). The reference to the classical Spartan constitution, and in particular to the dual kingship (lines 13-14), would suggest a date before the end of the third century B.C.; but this may be only plausible antiquarianism. It is certainly very odd to regard the ephors as an oligarchic element in the Spartan state (line 15). Nor is there anything very democratic, as Archytas alleges, about the ἡπαιρέται, the cavalry commanders. I would suggest that the author does not know what he is talking about.

here is a man with much higher powers, the βασιλεύς who is an ἑμφύλιος νόμος¹²⁸). A fourth-century discussion of kingship, such as that of Aristotle, tended to be purely theoretical¹²⁹); the more practical tone of the Archytas fragments, the working-out of the relationship of the king to the law, and the discussion of his nature and duties and powers, point to a date later than the fourth century, a date when such things were a reality¹³⁰).

So much for the fragments as a whole. But we must examine the "proportion fragment"¹³¹) in greater detail, for it is on this fragment that my argument depends. It contains three features which might arouse our doubts. First, the author calls the third kind of proportion ὑπεραντί; but Archytas, as we know¹³²), called it ἀρμονικά. But it might be argued that Archytas may have used both terms interchangeably (in fragment 2 he speaks of "the ὑπεραντί which they (or we) call ἀρμονικά"); and a forger would perhaps have taken pains not to make such a slip.

Secondly, there is the phrase καὶ μὲν ὧν ἰδέαι τὰς διανομὰς τῶσαῦται, καὶ δὲ εἰκόνες ἐν ταῖς πολιτείαις καὶ τοῖς οἴκοις θεωροῦνται. One's immediate reaction is to suspect the influence of the Platonic theory of forms, but Armand Delatte¹³³) most aptly cites Aristotle's *Metaphysics*¹³⁴): οἱ μὲν γὰρ Πυθαγόρειοι μίμησιν τὰ ὄντα φασὶν εἶναι τῶν ἀριθμῶν, and this phrase might be taken as a very striking example of that doctrine¹³⁵). Yet although ἰδέαι and εἰκόνες can have the meanings required here even as early as the fifth century, the combinations of

¹²⁸) Stob. 4,1,135 (p. 82 line 21). The implications of this exalted view of kingship are discussed by Goodenough, *op. cit.* in n. 112, 61 ff.

¹²⁹) See J. P. V. D. BALSBRON 'The Divinity' of Alexander, *Historia* i (1950), 368-71. Xenophon's *Cyropaedia* and Isocrates' *Nicoles* and *To Nicoles* do, however, attest a growing interest in monarchy in the fourth century.

¹³⁰) It is not a great step from "Archytas" on kingship to Eusebius on Christian kingship: see N. BAYNES *Eusebius and the Christian Empire*, *Mélanges Bidez* I (Paris, 1934), 13-18, esp. 17.

¹³¹) Stob. 4,1,137.

¹³²) See p. 130.

¹³³) *Op. cit.* in n. 112.

¹³⁴) 987 B 11.

¹³⁵) However, it might be maintained that Aristotle distorts the teaching of both Plato and the Pythagoreans in this problematic passage. See H. GUERINSS *The Riddle of the Early Academy* (Berkeley, 1945).

the two in the same sentence does seem very Platonic; but admittedly the *Metaphysics* passage might account for this too.

Finally, there is the fact that this Archytas fragment proposes an entirely new interpretation of the political significance of the proportions. In the classical theory, the equation was:

Arithmetical proportion	= democracy
Geometric proportion	= a superior constitution, which recognizes merit.

But Archytas asserts that:

Arithmetical proportion	= oligarchy and tyranny
Geometric proportion	= democracy
Subcontrary proportion (or harmonic)	= aristocracy.

The most extraordinary point here is that democratic justice is said to be in accordance with geometric proportion, τὸ δὲ δαμοκρατικὸν (sc. δίκαιον) κατὰ τὴν γεωμετρικὴν (sc. μεσότητα). This is unparalleled in the whole of classical Greek political thought. But that does not mean that it is spurious. We know what the constitution of Tarentum was like during Archytas' lifetime¹³⁶, but we do not know how it was described. It is not impossible that it was called a democracy, and in that case Archytas would be claiming that in a democracy, remarkable men (such as himself?) ought to be given special privileges; the mathematics of this will work out, though not in the usual way¹³⁷. On the other hand, it might simply be the statement of a bungling forger unfamiliar with the orthodox application of proportions to politics, or, more probably¹³⁸, of a late innovator trying to put new meaning into an old theory. It would certainly be very curious, if Archytas had praised geometric proportion as democratic proportion, that Plato, hardly a supporter of democracy, should take it over uncritically and, without any reservations, speak so enthusiastically of it in the *Gorgias*¹³⁹.

¹³⁶ See pp. 138-139.

¹³⁷ See pp. 123-124. But it is improbable, if Archytas were recommending geometric proportion, that he would also mention a superior type of proportion, the harmonic.

¹³⁸ See p. 125.

¹³⁹ 508 A.

But perhaps Plato seized on the fact that in geometric proportion remarkable men get remarkable privileges, forgetting that it was associated with democracy? Yet it remains odd, if this fragment really does represent Archytan teaching, that Plato praises geometric proportion not only in the *Gorgias*, but also in the *Laos*, where he calls it ἀλλοεστία καὶ ἀρίστη¹⁴⁰, and where he clearly implies¹⁴¹ that arithmetical proportion is democratic. Again, the fact that Archytas is known to have thought very highly of arithmetic – more so than of geometry¹⁴² – makes it most improbable that he would write that τὸ δὲ ὀλιγαρχικὸν καὶ τυραννικὸν (sc. δίκαιον) was κατὰ τὴν ἀριθμητικὴν (sc. μεσότητα).

All these arguments tend to suggest that Archytas was not the author of Stobaeus 4,1,137; and there is another piece of evidence which will increase our suspicions. There is just one parallel for the association of geometric proportion with democracy. But this parallel, for which we search classical writers in vain, comes from the sixth century A.D. I refer to the passage in Boethius¹⁴³, headed «*Quae medietates quibus rerum publicarum statibus comparentur*», which not only associates geometric proportion with democracy, but also associates arithmetical proportion with the rule of the "best" men, just as the "Archytas" fragment does. Moreover, Boethius gives the same mathematical reasons. The passages are so exactly similar¹⁴⁴ that there can be no doubt that both authors reflect a single source¹⁴⁵.

¹⁴⁰ 757 B; cf. p. 141.

¹⁴¹ ib.

¹⁴² DK 47 B 4.

¹⁴³ *Arithm.* 2,45, quoted and translated on p. 123.

¹⁴⁴ But neither is a translation of the other: the order in which the three proportions are discussed is different.

¹⁴⁵ See p. 125. Neither Boethius nor "Archytas" is the inventor of this new application of the theory: they both report (*dicunt, ponunt*).

Why, it might be asked, does the Archytan version of the proportions make no reference to kingship? Does not this suggest an early date, before the Hellenistic period, when kings had not yet begun to dominate the political scene? For no-one writing later than Alexander could ignore monarchy. But kingship might well be regarded as the extreme and most praiseworthy form of aristocracy (= harmonic proportion); in fact, there is no other way of accommodating it within the mathematical framework. The political theory of proportions was not designed to take monarchy into account; it fits badly, and the author ignores it. There are, in any

The cumulative force of the arguments against the authenticity of the political fragments of Archytas is thus very strong. Admittedly, some of the objections can be met; there is no evidence which is absolutely decisive; but there is enough, I believe, to conclude that in all probability Archytas did not write the fragments of the *περὶ νόμου καὶ δικαιοσύνης* with which he is credited.

(ii) *The λογισμός fragment*

This leaves us with Archytas' praise of *λογισμός* in an undoubtedly genuine fragment, DK 47 B 3: *στάσει μὲν ἔπαυσεν, ὁμόνοιαν δὲ αὖξησεν λογισμὸς εὐρεθείς· πλεονεξία τε γὰρ οὐκ ἔστι τούτου γενομένου καὶ ἰσότης ἔστιν.* The question arises, what is this *λογισμός*? Morrison implies¹⁴⁶, in my opinion wrongly, that it is harmonic proportion. It will be necessary to consider the question in some detail. Archytas has been saying that one must become *ἐπιστάμων*, and one can do this by discovering a *λογισμός*¹⁴⁷. What this *λογισμός* is, is not stated; nor, indeed, is it clear that Archytas has a particular *λογισμός* in mind at all – he might mean *any* formula or computation¹⁴⁸. But it seems at first sight very probable that Archytas was thinking, not of the harmonic proportion, but of the geometric proportion; for this is, after all, the only proportion apart from the arithmetical (which is, of course, out of the question) to which fourth-century writers attached any political significance.

The suggestion that Archytas' *λογισμός* is geometric proportion is strengthened by the following considerations. Archytas' *λογισμός* stops *στάσις*; *στάσις*, says Aristotle, arises because of *τὸ ἄνισον*, but not when there is geometric proportion¹⁴⁹. It increases *ὁμόνοια*: *ἰσότης γιγνέσθαι ἀπεργάζεται*, says Plato¹⁵⁰, and proceeds to discuss the virtues

case, continual references to kingship in the fragments as a whole (see p. 134); and within this fragment, the phrase *μόναρχος νόμος* (Stob. 4,1,137, p. 84 lines 9–10) surely alludes to the king (*ἐμφαυχός νόμος*, Stob. 4,1,135, p. 82 line 21).

¹⁴⁶ See p. 129.

¹⁴⁷ This appears to be the connection of thought between the first and second halves of this fragment; Diels, however, thinks that the two parts are not connected.

¹⁴⁸ The context will not allow the very general meaning of "consideration".

¹⁴⁹ *Pol.* 1301 B 26–27, reading *ὡ μὲν εἰ* with Newman and Ross.

¹⁵⁰ *Laus* 757 A.

of geometric proportion. It prevents *πλεονεξία*: *πλεονεξία* is the opposite of geometric proportion, says Plato elsewhere¹⁵¹.

The identification is moreover supported by what we know about Tarentum during the lifetime of Archytas¹⁵². We have two apparently conflicting pieces of evidence.

(a) Strabo 6.280 = DK 47 A 4:

Ἰσχυσαν δὲ ποτε οἱ Ταραντῖνοι καθ' ὑπερβολὴν πολιτευόμενοι δημοκρατικῶς . . . ἀπεδέξαντο δὲ καὶ τὴν Πυθαγόρειον φιλοσοφίαν, διαφερόντως δ' Ἀρχύταν, ὃς καὶ πρῶτος τῆς πόλεως πολὺν χρόνον.

It has been held that this shows that Tarentum was an extreme¹⁵³ democracy under Archytas, but as Minar¹⁵⁴ shows, the first sentence very probably refers to the period after the Persian wars, when Aristotle says that democracy was established after a revolution¹⁵⁵. The compression of Strabo's account is misleading.

(b) Aristotle, *Politics* 20 B 9–14:

καλῶς δ' ἔχει μιμεῖσθαι¹⁵⁶ καὶ τὰ Ταραντῖνων· ἐκεῖνοι γὰρ κοινὰ ποιῶντες τὰ κτήματα τοῖς ἀπόροις ἐπὶ τῇ χρῇσιν εὖ νοῦν παρασκευάζουσι τὸ πλεῆθος· ἐπὶ δὲ τὰς ἀρχὰς πάσας ἐποίησαν διττάς, τὰς μὲν αἰρετάς τὰς δὲ κληρωτάς. τὰς μὲν κληρωτάς ὅπως ὁ δῆμος αὐτῶν μετέχῃ τὰς δὲ αἰρετάς ἵνα πολιτεύωνται βέλτιον.

The present tense shows that this refers to the political organization during Aristotle's lifetime—a mixed constitution. As Armand Delatte¹⁵⁷ and Minar¹⁵⁸ have observed, there is a striking correspondence between this and Archytas fragment 3, in particular between Archytas' *διὰ τοῦτον οὖν οἱ πένητες λαμβάνονται παρὰ τῶν δυναμένων, οἳ τε πλούσιαι*

¹⁵¹ *Georg.* 508 A. In fact, of course, it is the opposite of any sort of *ἰσότης*.

¹⁵² In this I follow E. L. Minar, *op. cit.* (in n. 112), 86 ff. The particular situation at Tarentum is more relevant than Pythagorean political beliefs in general, on which see *ib.* 15–35.

¹⁵³ It is not easy to decide whether καθ' ὑπερβολὴν belongs with Ἰσχυσαν or δημοκρατικῶς. Minar takes it with δημοκρατικῶς, but earlier editors placed a comma after ὑπερβολὴν.

¹⁵⁴ *Loc. cit.* in n. 152.

¹⁵⁵ *Pol.* 1303 A 3.

¹⁵⁶ "Savonarola introduced a system like the Tarentine at Florence, probably being influenced by the teaching of the *Politics*" (Newman *ad loc.*).

¹⁵⁷ *Op. cit.* in n. 112.

¹⁵⁸ *Op. cit.* in n. 112.

διδόντι τοῖς δεομένοις and Aristotle's ἐκείνοι γὰρ κοινὰ ποιῶντες τὰ κτήματα τοῖς ἀπόροις¹⁵⁹).

Archytas, then, was a leading politician in a state which combined democratic and non-democratic features. In such a position he might well feel the need for a theory to show that exceptional men deserve exceptional privileges, and the analogy of geometric proportion would fulfil this function admirably. It is an attractive suggestion – but perhaps an implausibly neat one – that it was devised to justify his highly successful but illegal tenure of the στρατηγία for seven successive years¹⁶⁰.

So it looks as if λογισμός might very well mean geometric proportion. However, another fragment¹⁶¹ shows (i) that ἀ λογιστικά for Archytas meant arithmetic, and (ii) that he regarded arithmetic as superior to geometry, on the interesting grounds that unlike the latter it could furnish proofs¹⁶². This might suggest that λογισμός in fragment 3 should be connected with arithmetic rather than with geometry; and that Archytas is perhaps unlikely to have preferred geometric proportion to arithmetical. Certainly it must make us hesitate before assuming too confidently that λογισμός is geometric proportion; perhaps, after all, we should translate it in the most general way possible, as “formula”, or, better, “calculation” – which is what we would expect the unquali-

¹⁵⁹ The fact that Archytas was elected στρατηγός seven times in succession ἐπὶ τῶν πολιτῶν (the Suda, DK 47 A 2 – perhaps a misleading variant on πολιτῶν ἐστρατηγήσαε, Diog. Laert. 8.79 = DK A 1, the source of other material in this context) does imply a democratic constitution.

¹⁶⁰ See n. 159.

¹⁶¹ DK 47 B 4; authenticity undisputed.

¹⁶² On the implications of this, see O. NEUGEBAUER *The Exact Sciences in Antiquity* (Providence, 1957), 147–8.

Archytas is, of course, writing before the discoveries of Eudoxus, whose great advances in geometry “put him in the very first rank of mathematicians of all times” (T. L. HEATH, *Greek Mathematics I* (Oxford, 1921), 323. That Plato should regard geometry as superior to arithmetic (as his application of the proportions implies) indicates that he was not influenced on this point by Archytas, but rather by the achievements of Archytas' pupil in geometry, Eudoxus, and by his own friend and pupil Theaetetus. (The fact that Eudoxus was a pupil of Archytas is taken by Diogenes Laertius (8.86) from the *Pinakes* of Callimachus, a literary history in 120 volumes, and is more likely to be true than the statement that he was a pupil of Plato, which Diogenes takes from Sotion; for Callimachus wrote before Sotion, who in his *Διαδοχαί* was the first to employ the artificial system of master-pupil relationships (see Kirk and Raven, *The Pre-Socratic Philosophers*, 4)).

fied word λογισμός to mean¹⁶³. But there is a strong case, as we have seen, for saying that Archytas' λογισμός is geometric proportion, and these objections, I believe, are not sufficiently weighty to refute it. There is, moreover, one argument against taking λογισμός as “calculation”: while it makes excellent sense to talk of the “discovery” of geometric proportion (λογισμός εὐρεθείς), it is hardly as natural to speak of calculation in general as εὐρεθείς. If we accept the identification of λογισμός with geometric proportion, as I suggest we should, we could then draw the satisfying conclusion that we had found the origin of the application of the proportion to politics, and the exact reference of the allusion in the *Gorgias*¹⁶⁴.

We may now summarize the conclusions of this section. λογισμός in Archytas fragment B 3 could be simply “calculation”; the evidence which suggests that it is geometric proportion is very strong; but we have found nothing whatever to make us suppose that it might be harmonic proportion.

3. *Geometric proportion is always recommended as the model for political justice.*

I have already¹⁶⁵ touched on another argument against Morrison's theory, an argument which is, I think, both simple and conclusive. The whole tradition of Platonic and Aristotelian thought recommends geometric proportion as τὸ δίκαιον τὸ πολιτικόν¹⁶⁶, but we hear nothing of this harmonic proportion in the whole of classical political philosophy¹⁶⁷. For Plato in the *Laws*, geometric proportion, the Διὸς κρίσις, is ἀληθεστάτη καὶ ἀρίστη¹⁶⁸, and is even more highly praised than it has been in the *Gorgias*¹⁶⁹; for Aristotle, too, the oligarchic opposite of the democratic arithmetical proportion is the geometric¹⁷⁰, and this is the model of one form of justice in the *Ethics*¹⁷¹. Nor do Plato and Aristotle

¹⁶³ The use of λογίζεσθαι in the same fragment would support this conclusion.

¹⁶⁴ 508 A.

¹⁶⁵ p. 136.

¹⁶⁶ Pl. *Laws* 757 C.

¹⁶⁷ This point is made by Doods in his edition of the *Gorgias*, 26 n. 3.

¹⁶⁸ 757 B–C.

¹⁶⁹ 508 A.

¹⁷⁰ *Pol.* 1301 B 26 ff.

¹⁷¹ *E.N.* 1131 B 13 ff.

stand alone: Isocrates¹⁷²) and, later, Plutarch¹⁷³) give exactly the same version of the theory¹⁷⁴).

4. The »Republic« does not allude to the harmonic proportion

Furthermore, do the passages in the *Republic* to which Morrison refers allude to the harmonic proportion? In the first, Plato is describing the harmony within the soul of the truly just man:

(i) καὶ συναρμόσαντα τρία ὄντα ὥσπερ ὅρους τρεῖς ἀρμονίας ἀτεχνῶς, νε῅της τε καὶ ὑπάτης καὶ μέσης, καὶ εἰ ἄλλα ἅττα μεταξύ τυγχάνει ὄντα, πάντα ταῦτα συνδῆσαντα καὶ παντάπασιν ἓνα γενόμενον ἐκ πολλῶν, σώφρονα καὶ ἡρμωμένον. . . (RP 413 D-E)

In the second, he is comparing σωφροσύνη with a ἀρμονία (431 E):

(ii) ἀλλὰ δι' ὧν ἀτεχνῶς τέταται, διὰ πασῶν παρεχόμενη συνῆδοντας τοὺς τε ἀσθενεστάτους καὶ τοὺς ισχυροτάτους καὶ τοὺς μέσους, εἰ μὲν βούλει, φρονήσει, εἰ δὲ βούλει, ισχύϊ, εἰ δὲ, καὶ πλήθει ἢ χρήμασιν ἢ ἄλλῃ ὑποφύων τῶν τοιούτων ὥστε ὁρῶνται ἂν φαίμεν ταύτην τὴν ἡμῶναιαν σωφροσύνην εἶναι, χεῖρονός τε καὶ ἀμείνονος κατὰ φύσιν συμφωνίαν. ὑπότερον δεῖ ἀρχειν, καὶ ἐν πόλει καὶ ἐν ἐν ἐκάστῳ. (432 A-B)

It is important to take into account the contexts of these passages. Neither deals with the ideas to which the metaphor of proportion is applied elsewhere. (i) is concerned with justice in the individual, whereas the various kinds of proportion, when used in political philosophy, are concerned with justice in the state. Although a moment later¹⁷⁵) Socrates claims to have discovered τὸν μὲν δίκαιον καὶ ἄνδρα καὶ πόλιν, the discovery of the just city must be a reference to earlier passages, for Socrates has explicitly said that he is now talking not about τὴν ἑξω πρᾶξιν τῶν αὐτοῦ, but about τὴν ἐντὸς¹⁷⁶). (ii) is a description of σωφροσύνη in the state, not δικαιοσύνη, and is thus not relevant as an indirect parallel.

¹⁷²) 7 (*Areop.* 21; cf. 3 (*Nic.*) 14).

¹⁷³) *Solon* 14; *Mor.* 484 B (*de frat. amore*); 719 A C (*Quaest. conviv.* 8,2,2).

¹⁷⁴) See pp. 110, 113, 120, 122.

¹⁷⁵) 444 A.

¹⁷⁶) 443 D.

Morrison, following Cornford, translates the opening words of (i) "bringing into tune those three parts like the terms in the proportion of a musical scale". I do not find all this in the Greek. The octave (διαπασῶν) was composed of two tetrachords which might be conjunct or successive¹⁷⁷): the highest¹⁷⁸) (ὑπάτη), lowest (νε῅τη) and fourth (μέση) notes were thus the three fixed points in the scale. A modern writer making the same points might perhaps say "bringing them into harmony, exactly like tonic, mediant and dominant" – Plato intends a metaphor of concord, no more. There is no direct reference to proportion here, unless we lay great stress on the word ὅροι. But this is quite unnecessary: ὅροι may be terms in a proportion, but they can also be the fixed notes of the scale, the "boundaries" of the two tetrachords. This is what Plato has uppermost in his mind; I do not deny that in his allusive style he may intend a glancing mathematical suggestion. But this cannot be the primary meaning: for (a) if it were, what could we make of καὶ εἰ ἄλλα ἅττα μεταξύ τυγχάνει ὄντα? Other notes in the scale would produce all sorts of proportions, not simply the favoured harmonic proportion – so that the phrase would be inept, according to Morrison's interpretation; but they would also produce further harmonious chords, which is surely the point of Plato's phrase, as Shorey saw¹⁷⁹). (b) Again, why ἄλλα and not ἄλλοι? Plato is no longer speaking of the chief notes of the scale; the others cannot strictly be called ὅροι. If he had meant ὅροι as "proportions", then he would have written ἄλλοι. (c) Finally, the verbs συναρμόσαντα . . . καὶ . . . συνδῆσαντα are more applicable to musical notes than to terms of a proportion.

The earlier editions of Liddell and Scott gave "proportions" as the meaning both here and at *Philebus* 17 D (ὅροι τῶν διαστημάτων); but this has been corrected in more recent editions to »notes which limit the intervals in the musical scale"¹⁸⁰). A glance at Aristoxenus' work on the

¹⁷⁷) ARISTOXENUS *Harm.* 59.

¹⁷⁸) Highest, that is, for the hand in playing the *kithara*, but lowest in pitch. See M. I. Henderson in the *New Oxford History of Music* I (Oxford, 1957), 345.

¹⁷⁹) Loeb translation, note *ad loc.*; his Shakespearian quotation is to the point.

¹⁸⁰) Similarly, the recent edition of Aristoxenus by Rios (Rome, 1954) gives *intervallic lines* as an equivalent for ὅροι.

elements of music is sufficient to settle the question. There we read that an interval (*διάστημα*) is something bounded (*ὀριζόμενον*) by two notes¹⁸¹). And τοὺς τῶν διαστημάτων ὁρῶντες¹⁸²) are clearly "the boundaries of the intervals", as Macran translates, just as again elsewhere¹⁸³) ὁρῶντες are "bounding-notes", a synonym of τῶν ὁριζόντων in the same chapter¹⁸⁴). We could hardly ask for better evidence than Aristoxenus. He was born at Tarentum, and received instruction from his father, who was a friend both of Archytas and of Socrates¹⁸⁵).

Similarly, there is no such reference in (ii); so that the claim that Plato here abandons geometric proportion for harmonic cannot be maintained¹⁸⁶).

Conclusions

Thus Morrison's theory can be shown to go far beyond the evidence. Its rejection allows us to place the composition of the *Gorgias* without hesitation after Plato's visit to Sicily in 388. Dodds in his edition¹⁸⁷) inclines towards this later date; Morrison's argument would be evidence for a date before the Sicilian journey. But the frequent references to Pythagoreanism in the *Gorgias* constitute a strong reason for dating it after the visit¹⁸⁸); and we can now do so confidently.

This enables us to rewrite this fragment of the history of philosophy. In 388 Plato visited Italy and Sicily "ut Pythagorae inventa perdisceret"¹⁸⁹).

¹⁸¹) ARISTOXENUS *Harm.* 15.

¹⁸²) *ib.* 49, cf. *Pl. Phil.* 17 D.

¹⁸³) *ib.* 56.

¹⁸⁴) The same meaning is required in *ib.* 59, already cited in n. 177.

¹⁸⁵) See Macran's edition (Oxford, 1902), introd., 86.

¹⁸⁶) IAMBlichus (*in Nic.* 118.23 Pist.) tells us that the harmonic proportion (which he thinks was invented by the Babylonians) was used by various thinkers and by "Plato in the *Timaeus*" (see n. 102). This is quite true (*Tim.* 36 A-B); and if the phrase implies "in the *Timaeus* but not elsewhere" - as it surely does - it would confirm our conclusions.

¹⁸⁷) 26-7.

¹⁸⁸) Dodds, *loc. cit.*

¹⁸⁹) Cic. *de Re Publica* 1, (10, 16: sed audisse te credo, Tubero, Platonem Socrate mortuo primum in Aegyptum discendi causa, post in Italiam et in Siciliam contendisse, ut Pythagorae inventa perdisceret, eumque et cum Archyta Tarentino . . . multum fuisse; no doubt an inference from Plato's 7th Letter, 326 A-B, where Plato gives dissatisfaction with contemporary politics and interest in political philosophy as motives for visiting Italy and Sicily.

Here he met various Pythagorean philosophers (among whom may possibly have been Archytas¹⁹⁰) from whom he heard about the different kinds of proportion, and perhaps about the relation of λογισμός to politics. This was elaborated by some of Plato's Pythagorean friends as follows: Democracy employs arithmetical proportion; this is the *ισότης* which is the basis of the Athenian constitution, with which Plato has been so disgusted¹⁹¹). A good constitution has a better basis, namely geometric proportion. That this doctrine was Pythagorean is virtually certain from the allusion to it in the *Gorgias*¹⁹²) in connection with another undoubtedly Pythagorean belief, attributed to οἱ σοφοί, Plato's regular name for the Pythagoreans¹⁹³). The possibility that it might have been the invention of Archytas is not ruled out by our discussion of the λογισμός fragment¹⁹⁴); it is very tempting to say that it was, for this would enable us to give a simple and straightforward account of the parentage of Plato's idea. This theory appealed to Plato's love of mathematics, and on his return he incorporated it (and other Pythagorean teaching) in the *Gorgias*, where the term η

¹⁹⁰) A later meeting with Archytas is certain (*Pl. Ep.* 7, 338 C, referring to Plato's second visit in 367); on the good effect which Archytas' friendship with Plato had on Archytas' reputation, see ps.-Demosth. 61 (*Erot.*), 46; this work, even if not Demosthenic, is quite possibly fourth century (N.W. and N.J. de Witt, Loeb Demosthenes VII, 41). There is, however, no clear evidence for a meeting in 388; yet such a meeting is taken for granted by many modern scholars (c.g. FIELD *Plato and his Contemporaries* (London, 1930), 14; MINAR *Early Pythagorean Politics*, 92; SMOULHÉ, translation of Plato's Letters (Paris, 1949), n. on 338 C; SINCLAIR *History of Greek Political Thought*, 124; SARTON *History of Science* I (London, 1953), 397; Dodds, edition of *Gorgias*, introd. 26.) Morrison, while granting this (*C.Q.* n.s. viii (1958), 202 n. 1), argues as though a meeting in 388 were more or less certain, relying on Cicero (cited in n. 92), whose account of Plato's western travels is not sufficiently precise to furnish any chronological data. (Two letters survive purporting to be from Plato to Archytas (*Pl. Ep.* 9; and 12 = *Diog. Laert.* 8,79), and one from Archytas to Plato (*Diog. Laert.* 8,80). Of these, Plato's 12th letter and that of Archytas are certainly spurious, and Plato's 9th letter almost certainly so, despite Cicero's citations, *de Fin.* 2,14, *de Offic.* 1,7. The reasons for rejecting them are clearly stated by Smulhé in the Budé edition of the Letters, introd. XCIV-XCVIII.)

¹⁹¹) *Ep.* 7, 326 A-B.

¹⁹²) 508 A.

¹⁹³) See Dodds' long note on pp. 337-8 of his edition. Cf. *Plut. Mor.* 719 A C (*Quaest. conviv.* 8,2,2), where Dicaearchus (fr. 41) is quoted as saying that Plato "mixed Lycurgus and Pythagoras with Socrates" by introducing geometric proportion.

¹⁹⁴) See p. 141.

ισότης ἢ γεωμετρικὴ "is introduced without a word of explanation, as if it were already familiar"¹⁹³). This is curious; either the *Gorgias* was intended in the first place for Plato's immediate circle, to whom he had explained the idea, or else Plato is making a deliberately casual reference to a newly-acquired piece of knowledge – not an uncommon human habit. An echo of the idea recurs for a moment in the *Republic*¹⁹⁶), *ισότητά τινα ὁμοίως ἔσσις τε καὶ ἀνίσσις διανέμουσα*; and in his last work, the *Laus*¹⁹⁷), Plato expounded it at length. Plato never swerved from his loyalty to geometric proportion into a flirtation with harmonic proportion, and Aristotle after him espoused the same principle. Geometric proportion was discovered by the Pythagoreans, and it was they who first applied it to political philosophy; but there is no good evidence that either they, or Plato, or Aristotle attempted to do the same with harmonic proportion¹⁹⁸).

HARVEY F. D., *Two kinds of equality* [chez les Pythagoriciens] ; cf. Plato *Philosophus*.

HARVEY F. D., *Two kinds of equality* : C&M XXVI 1965 101-146. | L'histoire de la théorie de la proportion géométrique, opposée à la proportion arithmétique en tant que fondement de l'égalité démocratique, et la critique de l'hypothèse de J. S. Morrison (cf. APh XXVII 144, sous Pythagoriciens, & XXIX 148, sous Plato) portent à placer la composition du *Gorgias* après le voyage en Sicile de 388, voyage au cours duquel Platon aurait rencontré des philosophes pythagoriciens qui lui auraient communiqué leurs idées sur les différents genres de proportions et la relation du *λογισμός* avec la politique.

¹⁹³) Dodds on 508 A. We cannot be sure that the theory of geometric proportion was not fairly widely known in intellectual circles in Athens in the fourth century. In that case, Plato might have heard about it there just as easily as in the West; but there is no evidence for such an assumption.

¹⁹⁶) 558 C.

¹⁹⁷) 757 A ff.

¹⁹⁸) My conclusions, if correct, are surprising: given the Pythagorean pre-occupation with music and *ἁρμονία* and their interest in politics, one would expect them to have applied harmonic proportion to politics. But what might be expected is not necessarily the truth.