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Center for Hellenic Studies Research Symposium

PLATO AND MATHEMATICAL PYTHAGOREANISM

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I. ARISTOTLE ON THE PYTHAGOREANS AND HIPPASUS OF METAPONTUM (CA. 510-CA. 450 BCE) (IAMBLICHUS, *ON THE GENERAL MATHEMATICAL SCIENCE* 77.4-24)

"Pythagoras came from Ionia, more precisely from Samos, at the time of the tyranny of Polycrates, when Italy was at its height, and the first men of the city-states became his associates. The older of these [men] he addressed in a simple style, since they, who had little leisure on account of their being occupied in political affairs, had trouble when he conversed with them in terms of learning and demonstrations. He thought that they would fare no worse if they knew what to do, even if they lacked the explanation for it, just as people under medical care fare no worse when they do not additionally hear the reason why they are to do each thing in their treatment. The younger of these [men], however, who had the ability to endure the education, he conversed with in terms of demonstrations and learning. So, then, these men [i.e. the mathematicians] are descended from the latter group, as are the others [i.e. the acousmatics] from the former group."[1] And concerning Hippasus, *our sources say that* while he was one of the Pythagoreans, he was drowned at sea for committing heresy, on account of being the first to publish, in written form, the sphere, which was constructed from twelve pentagons. He gained his reputation from discovering this, but all such discoveries were from 'that man' – so they call Pythagoras, and they do not call him by name.

[1] **Bold** passages are direct quotation of Aristotle by Iamblichus. *Italicized* passages are likely to be Iamblichus' own voice. Passages in unadorned text are unclear in origin, but likely to be summaries of Aristotle's writing by Iamblichus.

φικέσθαι τν Πυθαγόραν ξ ωνίας κα Σάμου κατ τν Πολυκράτους τυραννίδα κα κμαζούσης ταλίας, κα γενέσθαι συνήθεις ατ τος πρώτους ν ταις πόλεσι. τούτων δ τος μν πρεσβυτέροις κα σχόλοις δι τ ν πολιτικος <πράγμασι κατέχεσθαι,>[2] ς χαλεπν ν δι τν μαθημάτων κα ποδείξεων ντυγχάνειν, ψιλς διαλεχθναι, γούμενον οδν ττον φελεσθαι ν κα νευ τς ατίας εδότας τί δε πράττειν, σπερ κα ο ατρευόμενοι ο προσακούοντες δι τί αto ς καστα πρακτέον οδν ττον τυγχάνουσι τς γείας. σοις δ νεωτέροις νετύγχανε κα δυναμένοις πονεν κα μανθάνειν, τος τοιούτοις δι ποδείξεως κα τν μαθημάτων νετυγχανεν. αto μν ον εναι π τούτων, κείνους δ π τν τέρων. περ δ'ππάσου *λέγουσιν*, ς ν μν τν Πυθαγορείων, δι δ τ ξενεγκεν κα γράψασθαι πρτος σφαραν τν κ τν δώδεκα πενταγώνων πόλοιτο κατ θάλατταν ς σεβήσας, δόξαν δ λάβοι ς <ερών>[2], εναι δ πάντα κείνου το νδρός· προσαγορεύουσι γρ οτω τν Πυθαγόραν κα ο καλοσιν νόματι.

II. ARCHYTAS OF TARENTUM (CA. 420-CA.350 BCE) ON HIS PREDECESSORS (F 1 HUFFMAN = PORPHYRY, *COMMENTARY ON THE HARMONICS OF PTOLEMY* 1.3; TRANSLATED AFTER HUFFMAN)

Those who distinguish the sciences seem to me to do so well, and there is nothing strange (in suggesting that) they understand individual things correctly, what sort they are. For, after they made good distinctions between the nature of wholes, they were on their way to see well concerning things, what sort they are, part by part. In fact, concerning the speed of the stars and their risings and settings, they handed down to us a clear distinction; the same goes concerning geometry and numbers and – not least (of all) – music. For these sciences seem to be akin.

καλς μοι δοκοντι το περ τ μαθήματα διαγνμεν κα οδν τοπον ρθς αtούς, οά ντι, περ κάστου φρονέν. περ γρ τς τν λων φύσιος καλς διαγνόντες μελλον κα περ τν κατ μέρος, οά ντι, καλς ψεσθαι. περί τε δ τς τν στρων ταχυττος κα πιτολν κα δυσίων παρέδωκαν μν σαφ διάγνωσιν κα περ γαμετρίας κα ριθμν κα οχ κιστα περ μωσικς. tατα γρ τ μαθήματα δοκοντι εμεν δελφεά.

So they first undertook the examination of the fact that sounds could not exist unless impacts of things against one another were to happen. And they said,"an impact happens whenever things in motion collide and fall upon one another. Some moving in opposite directions, when they meet, make a sound as each slows the other down, but others moving in the same direction but not with equal speed, being overtaken by the ones rushing upon them and being struck, make a sound. In fact, many of these sounds cannot be recognized because of our nature, some because of the weakness of the blow, others because of the length of the separation from us, and others because of the excess of the magnitude. For the excess of the magnitude of sounds does

[2] Supplied from Iamblichus' *de Vita Pythagorica* 88, which has nearly the same text.

not steal into our hearing, just as nothing is poured into narrow-mouthed cups, whenever someone pours out too much."

πρ□τον μ□ν ο□ν □σκέψαντο, □τι ο□ δυνατόν □στιν ε□μεν ψόφον μ□ γενηθείσας πληγ□ς τινων ποτ' □λληλα. πλαγ□ν δ' □φαν γίνεσθαι, □κκα τ□ φερόμενα, μ□ □σ□ δ□ τάχει, περικαταλαμβανόμενα παρ□ τ□ν □πιφερομένων τυπτόμενα ποιε□ν ψόφον. πολλο□ς μ□ν δ□ α□τ□ν ο□κ ε□ναι □μ□ν τ□ φύσει ο□ους τε γινώσκεσθαι, το□ς μ□ν δι□ τ□ν □σθένειαν τ□ς πλαγ□ς, το□ς δ□ δι□ τ□ μ□κος τ□ς □φ' □μ□ν □ποστάσιος, τιν□ς δ□ κα□ δι□ τ□ν □περβολ□ν το□ μεγέθεος· ο□ γ□ρ παραδύεσθαι □ς τ□ν □κο□ν □μ□ν τ□ς μεγάλως τ□ν ψόφων, □σπερ ο□δ' □ς τ□ σύστομα τ□ν τευχέων, □κκα πολύ τις □κχέ□, ο□δ□ν □γχε□ται.

So, then, of the sounds reaching our perception, those which arrive quickly and strongly from impacts appear high in pitch, but those which arise slowly and weakly seem to be low in pitch...*etc.*

τ□ μ□ν ο□ν ποτιπίπτοντα ποτ□ τ□ν α□σθασιν □ μ□ν □π□ τ□ν πλαγ□ν ταχ□ παραγίνεται κα□ <□σχυρ□ς>, □ξέαφαίνεται, τ□ δ□ βραδέως κα□ □σθενέως, βαρέα δοκο□ντι ε□μεν...

III. ARISTOXENUS OF TARENTUM (CA. 375-CA. 300 BCE) ON HIPPASUS' EXPERIMENTS (F 90 WEHRLI = SCHOLIUM TO PLATO'S *PHAEDO* 180D4; TRANSLATED BY BARKER)

[On the phrase "Skill of Glaucus" (Γλαύκου τέχνη)] It is said either of things that are not accomplished easily, or of things that are made with great care and skill. For a certain Hippasus made four bronze discs in such a way that while their diameters were equal, the thickness of the first disc was epitritic in relation to that of the second, hemiolic in relation to that of the third, and double that of the fourth, and when they were struck they produced a concord.

□π□ τ□ν μ□ □αδίως κατεργαζομένων, □ □π□ τ□ν πάνυ □πιμελ□ς κα□ □ντέχνως ε□ργασμένων. □ππασος γ□ρ τις κατασκεύασε χαλκο□ς τέττερας δίσκους ο□τως, □στε τ□ς μ□ν διαμέτρους α□τ□ν □σας □πάρχειν, τ□ δ□ το□ πρώτου δίσκου πάχος □πίτριτον μ□ν ε□ναι το□ δευτέρου, □μιόλιον δ□ το□ τρίτου, διπλάσιον δ□ το□ τετάρτου, κρουομένους δ□ τούτους □πιτελε□ν συμφωνίαν τινά.

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