

customed refrain. Even the torch he carried sputtered and smoked, bringing tears to the eyes, and no amount of tossing could make it burn. The outcome was even worse than the omens foretold: for while the new bride was wandering in the meadows, with her band of water nymphs, a serpent bit her ankle, and she sank lifeless to the ground. The Thracian poet mourned her loss; when he had wept for her to the full in the upper world, he made so bold as to descend through the gate of Taenarus to the Styx, to try to rouse the sympathy of the shades as well. There he passed among the thin ghosts, the wraiths of the dead, till he reached Persephone and her lord, who hold sway over these dismal regions, the king of the shades. Then, accompanying his words with the music of his lyre, he said:

"Deities of this lower world, to which all we of mortal birth descend, if I have your permission to dispense with rambling insincerities and speak the simple truth, I did not come here to see the dim haunts of Tartarus, nor yet to chain Medusa's monstrous dog, with its three heads and snaky ruff. I came because of my wife, cut off before she reached her prime when she trod on a serpent and it poured its poison into her veins. I wished to be strong enough to endure my grief, and I will not deny that I tried to do so; but Love was too much for me. He is a god well-known in the world above; whether he may be so here, too, I do not know, but I imagine that he is familiar to you also. I beg you, by these awful regions, by this boundless chaos, and by the silence of your vast realms, weave again Eurydice's destiny, brought too swiftly to a close. We mortals and all that is ours are fated to fall to you, and after a little time, sooner or later, we hasten to this one abode. We are all on our way here, this is our final home, and yours the most lasting sway over the human race. My wife, like the rest, when she has completed her proper span of years will, in the fullness of time, come within your power. I ask as a gift from you only the enjoyment of her; but if the fates refuse her a reprieve, I have made up my mind that I do not wish to return either. You may exult in my death as well as hers!"

As he sang these words to the music of his lyre, the bloodless ghosts were in tears. Tantalus made no effort to reach the waters that ever shrank away, Ixion's wheel stood still in wonder, the vultures ceased to gnaw Tityus' liver, the daughters of Danaus rested from their pitchers, and Sisyphus sat idle on his rock. Then for the first time, they say, the cheeks of the Furies were wet with tears, for they were overcome by his singing. The king and queen of the underworld could not bear to refuse his pleas. They called Eurydice. She was among the ghosts who had but newly come, and walked slowly because of her injury. Thracian Orpheus received her, but on condition that he must not look back until he had emerged from the valleys of Avernus or else the gift he had been given would be taken from him.

Up the sloping path, through the mute silence they made their way,

up the steep dark track, wrapped in impenetrable gloom, till they had almost reached the surface of the earth. Here, anxious in case his wife's strength be failing and eager to see her, the lover looked behind him, and straightway Eurydice slipped back into the depths. Orpheus stretched out his arms, straining to clasp her and be clasped; but the hapless man touched nothing but yielding air. Eurydice, dying now a second time, uttered no complaint against her husband. What was there to complain of, but that she had been loved? With a last farewell which scarcely reached his ears, she fell back again into the same place from which she had come.

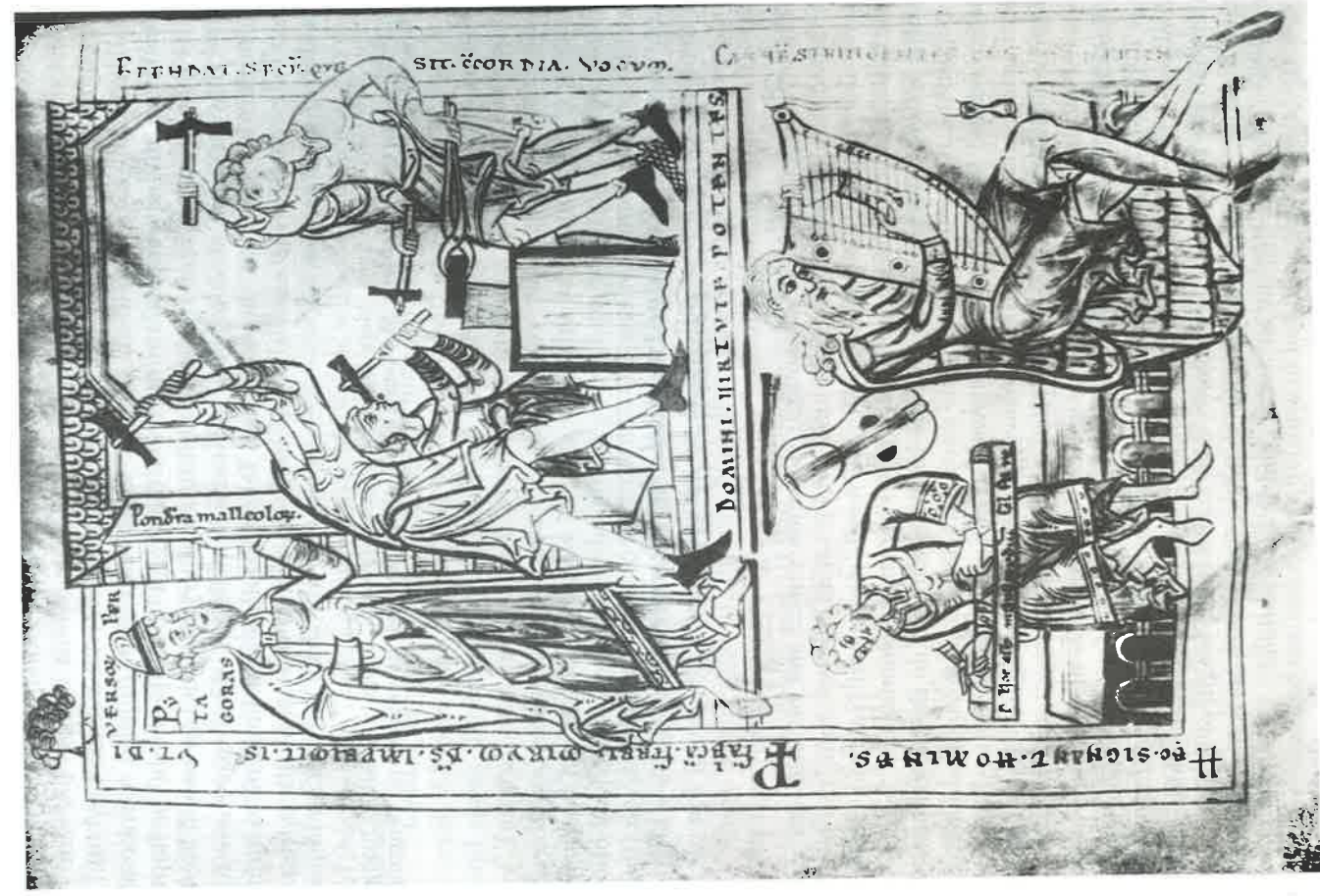
Ovid, *Metamorphoses*, trans. Mary M. Innes (Harmondsworth: Penguin Classics, 1955), 225-26. Copyright © Mary M. Innes, 1955. Reprinted by permission of Penguin Books Ltd.

2

Pythagoras and the Numerical Properties of Music

The mystic philosopher Pythagoras (sixth century B.C.) and his disciples are credited with the discovery of the numerical relationships governing the basic intervals of music—the octave, the fifth, the fourth, the second. Numbers formed the basis of the Pythagorean universe, and it is here that the notion of a "harmony of the spheres" was born, an inaudible harmony founded on the basic musical proportions. Hence the early intimate association between astronomy and music, later codified by Plato and his followers as related fields of higher learning. Pythagoras himself remains a shadowy, quasi-legendary figure, about whom many remarkable stories were told. Here is one of the most famous, as related by a neo-Pythagorean of the second century A.D.: it accounts for the invention of the monochord (here called *chordotonos*), the one-stringed instrument upon which the Pythagoreans and all later acoustical scientists, up through the Middle Ages, conducted their experiments. (Incidentally, the numerical proportions mentioned in the story are applicable only with regard to the length of strings—not their tension—and certainly not to the weight of hammers! This is further proof, if any were needed, that the ancient legend is a fabrication.)

Pythagoras being in an intense thought whether he might invent any instrumental help to the ear, solid and infallible, such as the sight hath by a compass and rule, as he passed by a smith's shop by a happy chance he heard the iron hammers striking on the anvil, and rendering sounds



Pythagoras, Inventor of Music. In this illustration from a thirteenth-century manuscript containing the famous treatise *De musica* by John of Cotton, the legend of Pythagoras and the blacksmith is depicted in the upper panel. The inscriptions read, "Per fabricam ferri mirum deus imprimit" (By means of a

smithy God has imparted a wonder) and "Is Pythagoras ut diversorum/per pondera malleorum/perpendebat secum quae sit concordia vocum" (It was this Pythagoras who, by the weights of the various hammers, worked out the consonances for himself). Down below, the monochord, a more "modern" device for tone measurement (see p. 51), is shown, along with a harp (laterally strung like a lyre), which represents music's power of "ethos" (see the readings on Orpheus and David). A vielle, or medieval fiddle, is also included in the design. This was the most widespread and versatile practical instrument in late medieval music (see Johannes de Grocheo, p. 65 below). *Munich, Bayerische Staatsbibliothek, C1m.2599, fol. 96^r.*

most consonant to one another in all combinations except one. He observed in them these three concords: the octave, the fifth and the fourth; but that which was between the fourth and the fifth he found to be a discord in itself, though otherwise useful for the making up of the greater of them, the fifth. Apprehending this came to him from God, as a most happy thing, he hastened into the shop, and by various trials finding the difference of the sounds to be according to the weight of the hammers, and not according to the force of those who struck, nor according to the fashion of the hammers, nor according to the turning of the iron which was in beating out: having taken exactly the weight of the hammers, he went straightway home, and to one beam fastened to the walls, cross from one corner of the room to the other, tying four strings of the same substance, length, and twist, upon each of them he hung a several weight, fastening it at the lower end, and making the length of the strings altogether equal; then striking the strings by two at a time interchangeably, he found out the aforesaid concords, each in its own combination; for that which was stretched by the greatest weight, in respect of that which was stretched by the least weight, he found to sound an octave. The greatest weight was of twelve pounds, the least of six; thence he determined that the octave did consist in double proportion, which the weights themselves did show. Next he found that the greatest to the least but one, which was of eight pounds, sounded a fifth; whence he inferred this to consist in the proportion 3:2, in which proportion the weights were to one another; but unto that which was less than itself in weight, yet greater than the rest, being of nine pounds, he found it to sound a fourth; and discovered that, proportionably to the weights, this concord was 4:3; which string of nine pounds is naturally 3:2 to the least; for nine to six is so, viz., 3:2, as the least but one, which is eight, was to that which had the weight six, in proportion 4:3; and twelve to eight is 3:2; and that which is in the middle, between a fifth and a fourth, whereby a fifth exceeds a fourth, is confirmed to be in 9:8 proportion. The system of both was called *Diapason*, or octave, that is both the fifth and the fourth

joined together, as duple proportion is compounded of 3:2 and 4:3, or on the contrary, of 4:3 by 3:2.

Applying both his hand and ear to the weights which he had hung on, and by them confirming the proportion of the relations, he ingeniously transferred the common result of the strings upon the crossbeam to the bridge of an instrument, which he called *Chordotonos*; and for stretching them proportionably to the weights, he invented pegs; by the turning whereof he distended or relaxed them at pleasure. Making use of this foundation as an infallible rule, he extended the experiment to many kinds of instruments, as well pipes and flutes as those which have strings; and he found that this conclusion made by numbers was consonant without variation in all.

John Hawkins, *A General History of the Science and Practice of Music* (London, 1776; reprint of 2nd ed., New York: Dover Publications, Inc., 1963), I, 9–10 (from Nicomachus, *Enchiridion harmonices*, trans. Thomas Stanley [1701]).

3

Plato's Musical Idealism

Its *ethos* made music a powerful force for good or for evil in the view of Greek thinkers. Plato, the most influential of them, dealt with the subject repeatedly. He looked down on the use of music for mere pleasure.

Second-rate and commonplace people, being too uneducated to entertain themselves as they drink by using their own voices and conversational resources, put up the price of female musicians, paying well for the hire of an extraneous voice—that of the pipe—and find their entertainment in its warblings. But where the drinkers are men of worth and culture, you will find no girls piping or dancing or harping. They are quite capable of enjoying their own company without such frivolous nonsense, using their own voices in sober discussion and each taking his turn to speak or listen—even if the drinking is really heavy.

Protagoras 347c–d.

Plato's nostalgia for an idealized Golden Age of Greece profoundly colored his thinking on music. When virtue and simplicity of customs ruled, music had seen better days. This ideal, probably strengthened by Plato's admiration for the supposed virtues of the disciplined, self-denying Spartans (as against the vices of the pleasure-seeking Athenians), leads him to set down pronouncements that will

find echoes whenever, in time to come, men will seek to control or reform music. For to Plato, and like-minded thinkers (including such non-Westerners as Confucius), musical license is but a step away from social chaos.

Our music was formerly divided into several kinds and patterns. One kind of song, which went by the name of a *hymn*, consisted of prayers to the gods; there was a second and contrasting kind which might well have been called a *lament*; *paean*s were a third kind, and there was a fourth, the *dithyramb*, as it was called, dealing, if I am not mistaken, with the birth of Dionysus. Now these and other types were definitely fixed, and it was not permissible to misuse one kind of melody for another. The competence to take cognizance of these rules, to pass verdicts in accord with them, and, in case of need, to penalize their infraction was not left, as it is today, to the catcalls and discordant outcries of the crowd, nor yet to the clapping of applauders; the educated made it their rule to hear the performances through in silence, and for the boys, their attendants, and the rabble at large, there was the discipline of the official's rod to enforce order. Thus the bulk of the populace was content to submit to this strict control in such matters without venturing to pronounce judgment by its clamors.

Afterward, in course of time, an unmusical license set in with the appearance of poets who were men of native genius, but ignorant of what is right and legitimate in the realm of the Muses. Possessed by a frantic and unhalloved lust for pleasure, they contaminated laments with hymns and paeans with dithyrambs, actually imitated the strains of the flute on the harp, and created a universal confusion of forms. Thus their folly led them unintentionally to slander their profession by the assumption that in music there is no such thing as a right and a wrong, the right standard of judgment being the pleasure given to the hearer, be he high or low. By compositions of such a kind and discourse to the same effect, they naturally inspired the multitude with contempt of musical law, and a conceit of their own competence as judges. Thus our once silent audiences have found a voice, in the persuasion that they understand what is good and bad in art; the old "sovereignty of the best" in that sphere has given way to an evil "sovereignty of the audience." If the consequence had been even a democracy, no great harm would have been done, so long as the democracy was confined to art, and composed of free men. But, as things are with us, music has given occasion to a general conceit of universal knowledge and contempt for law, and liberty has followed in their train. Fear was cast out by confidence in supposed knowledge, and the loss of it gave birth to impudence. For to be unconcerned for the judgment of one's betters in the assurance which comes of a reckless excess of liberty is nothing in the world but reprehensible impudence.

So the next stage of the journey toward liberty will be refusal to submit to the magistrates, and on this will follow emancipation from the authority and correction of parents and elders; then, as the goal of the race