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time that you'd like to draw from.) If you go back, say, to Pythagoras--who was kind of a legendary figure, who I kind of take as the start of this whole tradition, and the start of a lot of traditions in science and music as well, and mathematics even. Pythagoras' discovery that was important as far as this goes was the intervals of a musical scale--the harmonic, consonant in? tervals. The legend goes that he was walk? ing down the road and he heard a black? smith banging on some metal on the anvil. And he heard the hammers ringing. And they played these nice consonant intervals, playing like notes of the scale. And he went and examined this and found that the hammers that the blacksmith was pounding on weighed 6, 8, 9. and 12 pounds--or whatever, you know--they were in that ra? tio (to one another), the proportion. And he took it from there, that there were these numerical, mathematical ratios in? volved in producing these musical sounds. We hear these consonant intervals and these notes, this harmony that we immedi? ately take to. We know that it's harmony, that there's something about it, where these sounds fit together. And he discov? ered this mathematical structure behind it. The ratios--what he was hearing--were very basic to the nature of number in mathematics. He found later, experimenting with a length of string under constant tension--by changing the lengths of the string, the notes that were produced--he could get all the consonant intervals of the scale. And they were expressive of very simple mathematical ratios. (For example:) One-to-two. If one string was twice as long as another, it played an octave. (Thus in the scale of C--CDEFGABC --the interval CG. eight notes including both Cs. is an octave.) If the ratio was two-to-three--one string was two units long, another was three--that would give you a fifth, a musical fifth--doh to soh. (C to G is a fifth.) And so on. Three-to-four would give you a fourth. (C to F.) To keep going, four-to-five gives you a major third. But basically, on a scale from con? sonance to dissonance in music, what we perceive intuitively as harmony or dishar? mony flows from the very simplest ra?

tios .... And on a scale from consonance to dissonance, the more dissonant the note becomes, the more complex the ratios be? come. So in a sense, this flowing of har? mony is identical with the flow of numbers from unity to complexity.