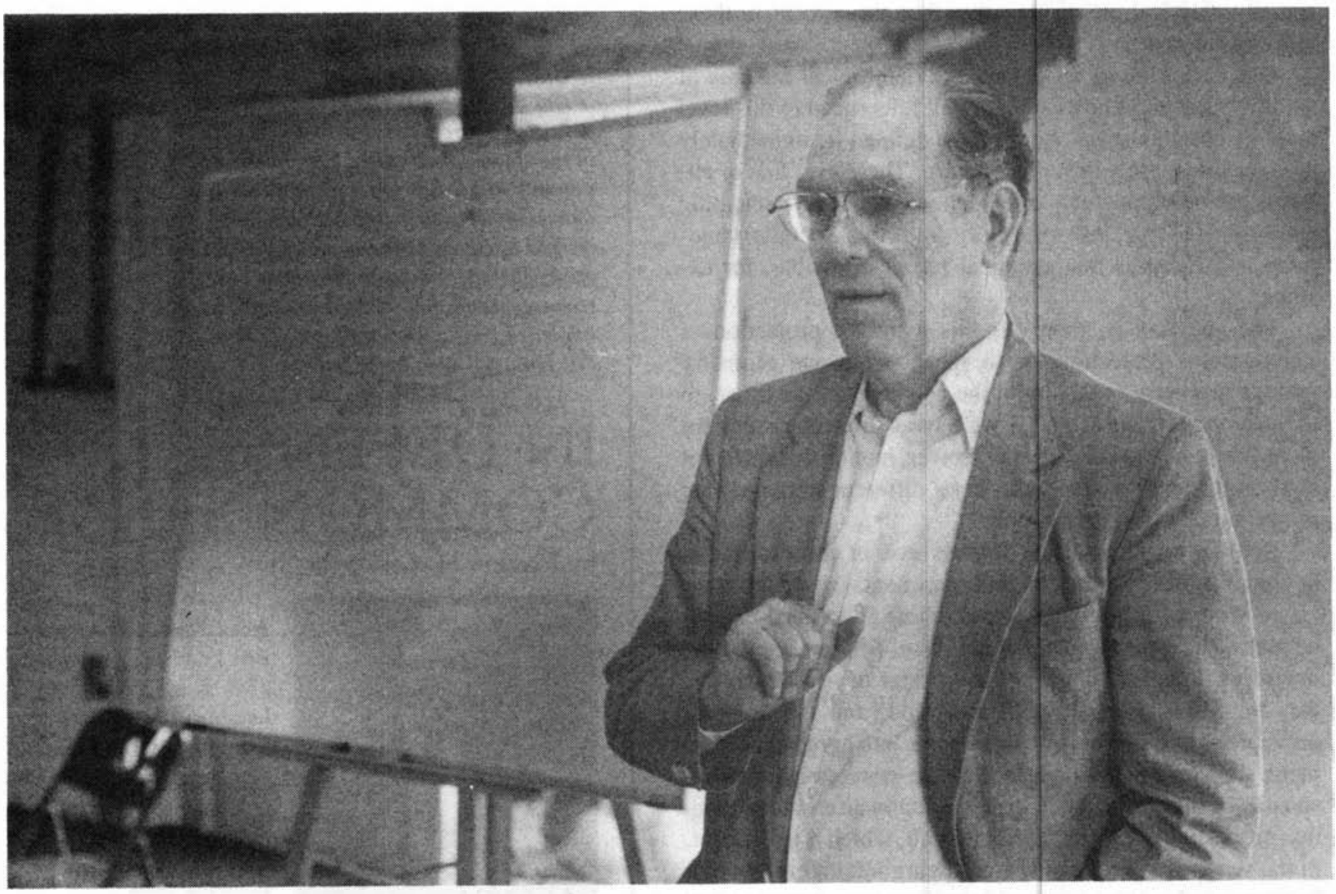
14

The uses of deduction

Let us continue the line we have just been exploring. Let us compare what we have said in the previous section with our earlier references to the importance of the *Monadology* of Leibniz, and to the refutation of the attack on the *Monadology* by Leonhard Euler. We shall then see how what we have just said pertains to mathematical physics, for example, concretely.

We repeat: It is the generally accepted view, among educated mathematicians and mathematical physicists today, that the only acceptable argument in physics is that form of argument which is couched in the accepted terms of reference of a deductive/inductive form of commonly used classroom mathematics.

I object: "That commonly used classroom mathematics is faulty, and cannot possibly represent the real universe." This was first emphasized, as I referenced this problem in



Lyndon LaRouche teaching a class on scientific method in 1985, in Leesburg, Virginia.

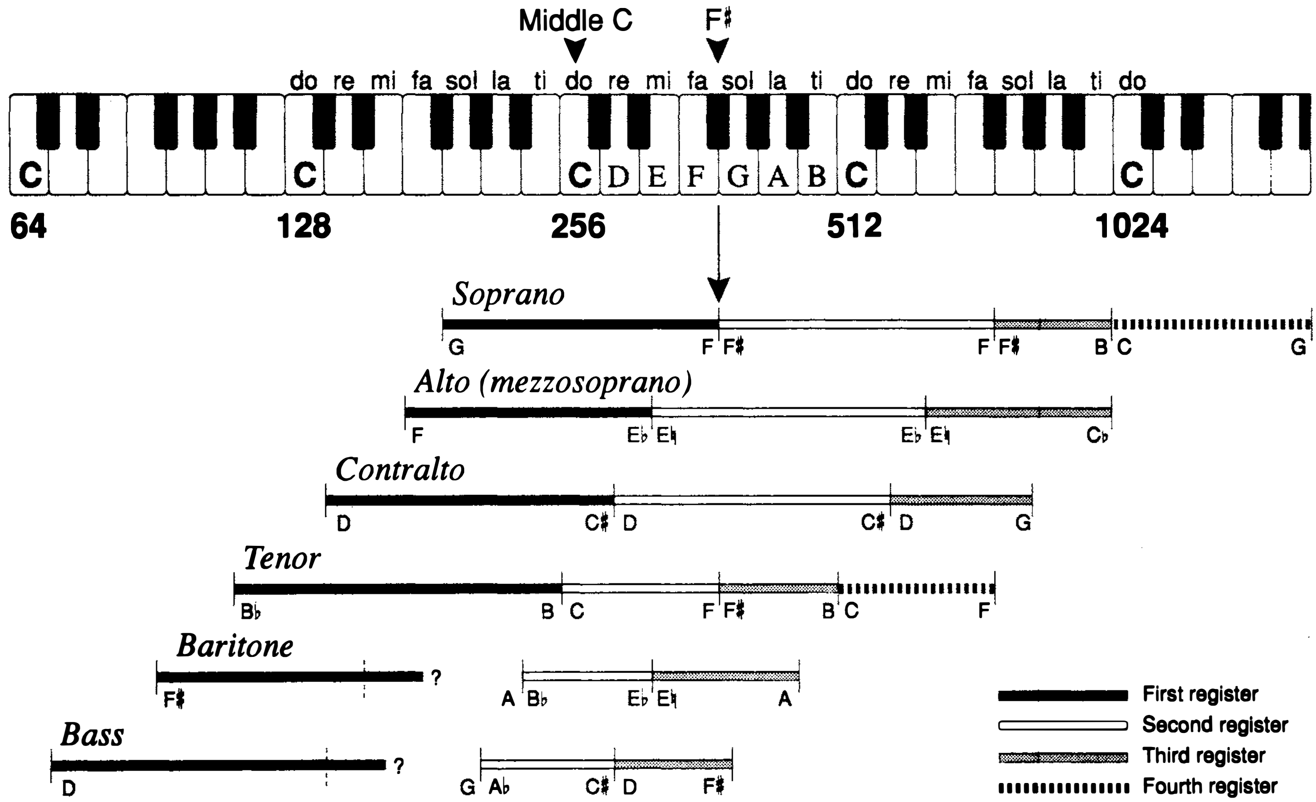


Chart of registers in trained singing voices.

the text of *In Defense of Common Sense,* in connection with Newton's *Principia.*

Newton was astute enough to recognize that what we call today the Second Law of Thermodynamics had made its ugly appearance, implicitly, in his text. He pointed that out to the reader, and said, in effect, "This is absurd. That is not the way the universe functions, and it is not my intent to convey that impression to you. However, I was compelled to show that, because of my choice of mathematics."

Now, what Newton was saying, effectively, is that the only mathematics which he considered acceptable at the time is a deductive/inductive form of mathematics, of the type which coheres, in most respects, with the doctrines and dogmas of Aristotle, Descartes, and Kant, the things we have refuted in *In Defense of Common Sense,* and in a number of earlier published titles, as well as here. That in any deductive mathematics or linear mathematics (the same thing), there is automatically introduced, to the physical evidence, superimposed upon the physical evidence, the appearance of a universal entropy. That is, a kind of averaging down of a statistical-gas-system process toward the point that there are no heat differences in the universe, and therefore no potential, in terms of the kinetic theory of gases or things of that sort, from which to generate, spontaneously, any work in the universe. So, the universe is seen to run down into heat death, through this so-called ergodic process, or something analogous.

In point of fact, the universe is of quite a different order. The universe is a positively evolving universe, evolving to higher states. The universe is characteristically negentropic.

Therefore, we must reexamine this mathematics, this deductive notion of mathematical physics. It does not correspond to the physical universe, but mathematical physics based on that kind of mathematics does superimpose the appearance of things like a pseudo-law of physics, a Second Law of Thermodynamics, upon physics. It gives us a false physics.

Whereas we know from the standpoint just argued in the previous section, for example, and from earlier references to the Euler problem, relative to the *Monadology,* that a proper physics can be constructed free of this, if we are willing to forego the habit of deductive/inductive formalism.

What does that require?

We have to reject the deductive formalism, essentially, as we would depict it in a context we have been developing here, because we have shown that scientific progress, the essential feature of man's mastery of nature, is associated with a succession of scientific world outlooks. Usually, the successor, in this ordering, is superior to the predecessor. Crucial experiments, which overthrow or show the fallacy inherent in the axiomatic structure of an implicit or explicit set of axioms and postulates, lead to the generation of a new set of axioms and postulates, such that there is an unbridgeable gulf between any two successive sets. That we can portray, at least if we use a deductive mathematics, the progress of science, in terms of this succession of sets of axioms and postulates—the deductive systems.

The deductive systems do not represent science; but they represent our attempts to *approximate* a consistently deductive representation of the possible theorems which might be advanced from the practice of physical science as we know it empirically at that point.

We have shown that creative reason cannot be encompassed by this; creative reason lies in what we have indicated to be the third level of self-consciousness. Therefore, we must have a mathematics which represents that. Obviously, a constructive geometry consistent with the third level of self-consciousness would be adequate for this purpose.

Let us just mention again the problem of geometry, to make sure we are absolutely clear.

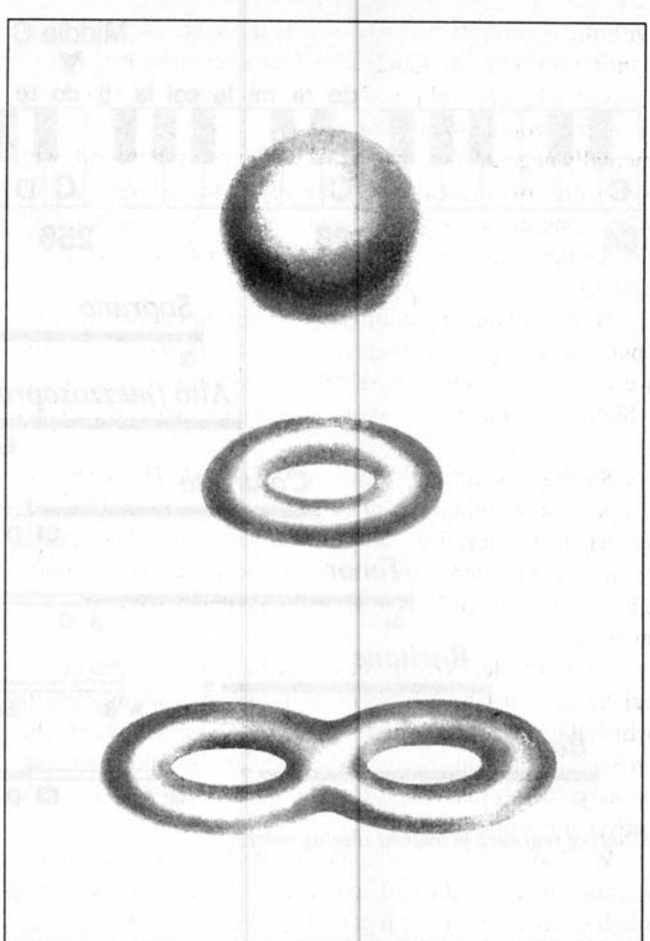
We cannot, obviously, use any form of arithmetic or deductive algebraic schema as an acceptable mathematics for representing a competent mathematical physics. We have to throw them all out. Obviously, for similar reasons, we would also throw out a deductive geometry, such as a formal Euclidean geometry. For the same reason, we would throw out most of the formalistic versions of so-called non-Euclidean geometries, because these are actually, simply, neo-Euclidean geometries, that is, Euclidean geometries, altered by tampering with some among the axioms and postulates of an existing formal system.

We require, therefore, a purely constructive geometry, which depends upon *no* axioms and postulates. Otherwise, we can't be rid of this deductive curse. The question is, what are the specifications of that constructive geometry, which are required for this purpose?

Obviously, it must be a constructive geometry which is based on the isoperimetric proof. It must be a projective geometry which is a multiply-connected form of action of this isoperimetric form. It must elaborate itself simultaneously as multiply-connected, in the sense of a double-conical geometry, for example. And, it must correlate that with a simultaneous expansion in another kind of ply, the simple Rouladen (non-algebraic curvatures, which are generated by rotations).

Our geometry must also satisfy another specification. It must be based ontologically on the notion of monads. That is, we must think of a continuum, in which the continuum, in an evolutionary way characteristic of the system, generates monads.

Without getting immediately into the question of the higher monads, which we are, just look at ordinary good monads, good singularities. Let us concentrate on those kinds of singularities, which correspond to negative curvatures denting, so to speak, a Riemannian surface. So, let us call that, as I have proposed earlier, a *Riemann-Beltrami* surface.



Riemann Surface Function modeled. Here we see a simply connected surface, a doubly connected surface, and a triply connected surface.

So, those geometries which generate, in a lawful way, the characteristics of a Riemann-Beltrami surface function, are a minimal condition for a good mathematical physics.

This bears upon one of our big problems in physics today. Let us look at some of the implications. Let us take the case of Kepler versus Galileo, Descartes, and Newton, for example.

Kepler's physics is correct, at least as far as he makes any claims for it. That was proven during his time, and through the time of Gauss; Gauss's work on the implications of the asteroids proves in a crucial and unique way, that Kepler's astrophysics is correct, relative to every contrary claim of the incorrect Newton and Newton's supporters.

The negentropic curvature of space-time associated with the harmonic orderings of the Golden Section, is the basis for the construction of Kepler's system, to a large degree *a priori*, as Kant would say, synthetic *a priori*. But, in a sense, it is not, *a priori*, because Kepler shows two things.

First, on an empirical line of development, associated with the contributions of Leonardo da Vinci and others, in connection with the Golden Section's significance, Kepler had crucial empirical proof that the universe was negentropic, as we would say, that is, relative to entropic: it is fundamentally negentropic, that is, a developing system; and, with a curvature of physical space-time, consonant, and congruent with, coherent with, the harmonic orderings consistent with the Golden Section. That is the instruction of Kepler's system.

He proves that, by finding that the empirical values correspond to, and give scaling to, such a geometry. And, thus, we have his system: the Keplerian system of harmonics, which he correlates with musical harmony, and quite rightly so.

So that we have the two intersections. The geometry gives us a seemingly *a priori,* synthetic *a priori* view of universal physics, i.e., Kepler's physics. But this physics cannot be perfected without reference to those crucial empirical data which enable us to scale the system. That is also true in music.

For example: We can show, in a similar way, that classical music must be based on well-tempered harmonics, in which the harmonics is ordered in congruence with the Golden Section; but that doesn't prove middle C should be approximately 256. It may suggest it, but it doesn't prove it. What proves it is something else.

We look at the human voice, the well-trained human singing voice—and of all species, as we identify species of singing voice. We find, first of all, the human singing voice follows harmonics that are consistent with the Golden Section harmonics.

So far, so good.

However, we find that the singing voices, so tuned, have register shifts within them. (*See chart, page 47.*) These register shifts are consistent with the species of singing voice. And, therefore, we must scale the musical system to fit this empirical datum of the register shifts, which is historically, pretty much how the well-tempered system developed, through Bach, Mozart, Beethoven, and the other classical composers, such as Chopin, Schumann, Brahms, as opposed to the romantics, such as Liszt, Wagner, what-not, who all went, of course, for the higher, elevated tuning.

That is the general nature of the thing.

So, what we must do, always, is to guide the mind by such a constructive geometry. Use that guidance, relative to existing physical knowledge, to define new crucial experiments, which enable us to do two things: to demonstrate the appropriateness of our construction to physics, empirical physics, and to provide us a scaling of those functions, as we have indicated by the two examples, the scaling of the solar system by Kepler, relative to a geometrical construction or a method of geometrical construction, not a complete *a priori* one, but a method of construction; and the case of the well-tempered system.

Why do we get C approximately 256? Well, we get it from this evidence, in terms of the natural harmonics of the human singing voice. That is the essence of the matter.

Thus, from this discussion, we see into some of the ways in which the third level of self-consciousness, and the organization of thought on that level, defines a necessary form of, for example, physical science, the way we can comprehend consciously, empirically, the lawful ordering of the universe. All we must include in that, as we specified, beyond the correct geometry as such, is to recognize that the geometry must be a monadology—that no constructive geometry will allow us to assume the infinite divisibility of any portion of physical space-time, but requires a monad at every point of singularity.

Of course, again, these monads are not self-evident, discrete particles, not discrete bodies in any sense. Rather, they are the generated singularities, like the singularities of a Riemann-Beltrami surface function, which are lawfully generated, and *necessary* in the continued elaboration of a Riemann-Beltrami surface function.

The monads define the special features of the proper choice of constructive geometry. Hence we have a continuous constructive geometry, which also has discreteness, and yet on a higher order, is continuous, nonlinearly, so to speak, despite the appearances of these singularities, which are discreteness.