

- XVI.** Ah ... what? ... My beautiful friend conscience, you are right this is all a trick: the absolute truth does not exist in physics ... or in logic ... or in mathematics ... ; everything changes, everything is in motion, it is a long journey that will never end, if the number of proposition is extended ...
- XV.** I incidentally read an article in the la Repubblica by Mancuso on the concept of truth of Christianity, which according to Chateaubriand is the ability to produce beauty, so I think that beauty can be true value of unprovable statements (for example policy choices, economic choices, moral choices); but if the generating beauty was something more, and applicable to scientific areas (to compare two theories tested true experimentally); beauty as scientific proof of mathematical physics, and then the mathematics as aesthetically more beautiful than other formalization to represent the reality. Then the description of the world is beautiful in mathematics, but it is not the only one possible.
- XIV.** I thought that mathematics could be transmitted through many media: the Matrix with a neuronal change, Negroponte with a pharmacological cure, but I thought that in geological time a civilization can assimilate knowledge innately (as with insect innate behavior): at that point mathematics is awareness of the manipulation of abstract objects, like a chess game, with its rules; but, then why the formal structure of the chess does not represent the reality, while the mathematical physics with its formal game is the reality? Mathematics is born, both in geometry and in calculus, for real need (the physics of the early days), measures, calculate income, calculate heights and distances, triangulate; then the mathematics is born as a game on the world, and no one has ever disconnected for millennia, so that the connection with the reality is in the rule of the game: it is not an abstract game, but is an applied game. Since the tool worked, then it has continued in formal construction, and has melted with the reality; but it would have been possible to obtain alternatives with other natural languages (Hooke's law is an example), although with slower result, because the concepts of natural languages are more vague, and misinterpretations are possible; but politics, social science, jurisprudence and Ten Commandments, psychology use vague languages, and they work in the improvement of the civilization: the natural language is the means by which civilization are able to describe, and shape, the reality with rules of a game.
- XIII.** I incidentally read the last book of Italo Calvino that write that the natural language is more vague than formal, but where some poets can make us relieve the experience, and full knowledge with a perfect exercise in style.
- XII.** Mathematics is a way to reality description with formulas that change over the time in the form, and the contents, such as a genetic evolution that fits the reality; there are alternative methods to describe a mathematical concept? We can manipulate symbol like we manipulate objects, or like we perform a sculpture? A transformation

of a sphere in a torus is an idea that can be realized in a virtual reality, and the transformation can be adapted to the reality through a computer aided drafting, and if the problem is a mathematical optimization of aerodynamic type, we are doing mathematics with alternative theories?

- XI.** I thought that the language (mathematical or natural) permit to portray the reality, to make prediction; some like mathematics enables the knowledge transfer in an optimal way, with a channel with maximum capacity, but it is possible that there are other methods of scientific transmission (visual, neuronal) that optimize the information transfer, and that the mathematics is only a temporary optimal means.
- X.** I thought that the Hooke's laws could be expressed like Elasticity law, so that the name expresses the meaning of the law: the information content is the same, Elasticity law=Hooke law; we think to have to transfer a system of knowledge to a civilization that does not have our knowledge, the historical fact "*ut tensio, sic vis*" is important, meaningful, interesting, culturally deep, but between two transmissions, the ahistorical has maximum compression of information (transmission channel with maximum capacity), has not history, has not time, has no space.
- IX.** The theoretical results obtain so far, were open to alternatives ways, then why follow an historical rather a logical line?
- VIII.** If we could simplify the demonstrations of the theory world, with a reduction of the length, a simplification of the steps, a reduction of the historical genesis and historical evolution! Who knows who invented the zero? Who invented the wheel or the bow? The years that are necessary to learn (and get results) can be reduce.
- VII.** I thought that the mathematical reasoning is not ever formal, for example there are the Coulomb's law and the Newton's law, they describe particles system repeling same charge, and attracting same masses. The magnetic field is obtained by the relativistic motion of charges, then the same could happen for the motion of masses (a moving mass like a moving charge), except for some sign, and parameters, could be written the Maxwell's equation for masses? Do I use mathematics in this prose? Should it be possible to write the Einstein field equation like Maxwell's equation to simplify some problems? Is there a metric tensor for the electric field (an electric curvature)? Is it possible to deflect a photon with an electric curvature? These are statements of mathematical physics, in the area of the natural language (no formula). Can we make research with the natural language? Something is missing in the absence of precision?
- VI.** Each parameter of the physics is assumed constant, but nothing changes if there is a little variation (if there are little variation in million of years, the life remain possible, and the laws are true locally) in the time, because the approximation of

the coefficient of the series can be the new parameters; in each case it is possible to write the physical law with coefficient of the series that do not change with the time.

- V. So why every formal system works in our reality?
- IV. Each human reasoning admit a mathematical formalization, and the final result is a description of ideas that can be applied to the reality; then the our thoughts have the same expressive power of the mathematics; each language, that is mathematics, logical, poetic, cinematographic, figurative, sculptural, expressing a concept of the real world, its evolution, its not banal meaning, is a representation with the same information content (expressions with the same Kolmogorov complexity contain the same information). Then I expect that the truth value of an information content to be the same, even if the language is different; and I believe that the Godel's incompleteness theorem is applicable to any language, then there are limits of Boolean truths in the various representations: this reminds me "*Ceci n'est pas une pipe*" by Magritte.
- III. May We formalize a day the mathematics in other languages, less formal, so that they can explained to a teenager (at least in the deepest sense) using only few words? Might it be possible for some branches of mathematics, or branches of physics, express theorems in simple languages: once the results have been obtained, then the demonstration would be useful for future developments, but all is like to ask a surgeon to explain the synthesis of the scalpel (or each of the thousands appliances) to use it in the daily surgeon.
- II. What is mathematics if not the abstract formulation of a logical reasoning: an integral is a surface (or a volume), a derivative is a tangent, a vector a direction of movement (an arrow), an equation of motion (or a differential equation) is a surface (that constraint the motion) in a space with derivative coordinates, a natural number is a set, a fraction a slice of a cake, a real number is a position on a line, a complex number is a position of a gear, the Oresme coordinates (or graph of a function) like a continuous vertical abacus (?), the law of motion like path with minimum time distance, the Fourier transform is an overlap of water waves able to create any image on a surface.
- I. Physical-mathematical thoughts: prose or theory?