

# Could Elements of Hydraulics Cure the Ills of Contemporary Science?

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## ABSTRACT

The mechanical-engineering explanation for the gravitational field proposed by Johann Bernoulli (1667-1748) in the field of hydraulics is reconsidered. This is integrated with the resolution of a historic discomfort about sink and source singularities, achieved by applying the expanding Earth hypothesis and considering the recent *Borexino* and *KamLAND* experiments on the Earth's heat balance. This approach may resolve numerous issues in modern science, unifying multiple phenomena into a new non-Newtonian physics. In this new conception, gravitation, redshift, and expansion of celestial bodies are caused by Bernoulli's *central torrent*, while the principles of inertia, escape velocity, invariability of physical constants, etc. are relegated to good local approximations of a more complex physical reality.

**Keywords:** Hydrodynamic Gravitation, Expanding Earth, Material Coulomb Fields, Relativities and Cultural Hegemonies.

*The real "crisis of scientific rationality" lies precisely here: in the fact that there are people stubborn in this refusal [of the value of scientific knowledge] and that our ruling class, while certainly not willing to give up the practical results of science, hypocritically favors the spread of this refusal in order to curb the critical urge intrinsic to scientific rationality, in the ill-concealed fear that it will end up applying it also to the evaluation of the way in which the basic organizational problems of the modern world are usually treated.*

(Ludovico Geymonat [1], closing sentence of his 1977 book)

## INTRODUCTION: TWO BIG PROBLEMS

Geoscience data is interpreted at a local or regional scale applying a theory remote from natural reality, forcing the data into a paradigm, while obscuring discrepancies and contradictions. As we ascend to continental, oceanic, and planetary scales, the discrepancies and contradictions become more apparent. Examples include the similarities between continents and ocean basins in the Pacific, the temporal development and direction of Polar Motion, the Jurassic fragments of the Indian and Pacific Oceans fitting together on an Earth of half radius, an excessively large Tethys, the closing Mediterranean, etc. [2, 3]. It is possible to solve these problems without *plate tectonics* and the hypothetical subduction of the crust and lithosphere, which derive from the dogma of invariability of the Earth's radius. Instead, in the *Expanding Earth* approach, the forces at play are mainly distensional, allowing us to formulate a more realistic orogenic mechanism, as described in [3, 4, 5] to which we refer.

Physics and its derivative sciences (astronomy, cosmology) are currently facing comparable quandaries. Newtonian physics (with gravitational fields) and Maxwellian physics (including Lorentzian relativity) work well on time and space scales of a few millennia and typical solar system distances. Larger scales reveal greater distortions: the Galaxy exhibits difficult to explain spiral arms, and rotational speeds that can only be explained by hypothesizing dark matter; the *Big Bang* requires the ad hoc process of Cosmic Inflation to link the initial instants with present time along the time axis. Could there be elements missing from the physics of Galileo, Newton, and Maxwell?

### A SICK SCIENCE

The examples cited above are two of the many "open wounds" or "buboes" that afflict contemporary science. There is also a positive way of looking at this: every bubo can potentially be healed (perhaps all at once), opening the road to progress, and breaking continuity with previous conceptions. Further open wounds could be mentioned here, but the two mentioned above are the most closely interrelated.

The first thing they share is that the English-speaking world firmly defends conceptions born within its own cultural ambit. *Plate tectonics* with its compressive orogenetic mechanism perpetuates the teachings of the Anglo-Saxon academic old guard, conceiving of the Earth as wrinkled by thermal contractions during cooling, like a dehydrating apple, causing crustal compressions that pushed up the mountain ranges.

The same applies for the theories of gravitational and electromagnetic fields (and various relativities) with their precise deductive capacities for the spatial and temporal "vicinity". The English-speaking tradition persists in renouncing any attempts to identify causes for the same fields. It has become conventional simply to accept the existence of an acceleration field, even though this is nothing more than a representation of what happens, without considering causes. The gravity field of intensity decreasing as  $1/r^2$ , is simply a force exerted on a unit mass  $m$  located at a given point, but the force does not exist at another different point if a unit of mass  $m$  is not present there. The field is therefore a point-by-point mapping of what a unitary mass  $m$  would experience if located in an infinity of points in the space surrounding a central massive body with  $M \gg m$ . There is no perception, and no consideration is given, to what really exists in all the infinite points where  $m$  could be located, and what would exert a physical action on  $m$ . This is something ignored by Newton for historically determined reasons, and by his descendants for reasons of their own, favoring idealistic currents that believe themselves capable of deforming space and time, rather than kneading their hands in the more prosaic material fields.

The Newtonian gravity field is thus an incomplete phenomenological description of physical reality (similarly the electromagnetic field). It is obvious that we should be looking for a material substance as cause (physicists do not believe in magic), that its motion is probable, and that action at a distance is inconceivable.

### THE RE-EMERGENCE OF THE ETHER

The sought-after substance has a long history and a name: ether. It is invisible to the eye but not to the senses in the broad sense. Air is invisible to us, as water is to fish, but we hear the

sigh of wind, feel its resistance when cycling, see the swelling of sails, cool down from waving a fan. Conversely, there is no conventional recognition for the presence of ether, perhaps due to modern educational traditions.

The author has experimented on people of various backgrounds (including students) by posing a question. "*If I throw a bunch of keys up,*" (throwing up some keys), "*why do they come back down into my hand?*" (Catching the keys as they fall). The invariable answer is, "*There's the force of gravity*". So, I continue, "*Who exercises it?*" "*The Earth*". "*But the keys are up there while the Earth is below our feet*", I query. "*There's a gravity field*." I then explain that this is no actual physical field but only a map of the phenomenon they become disoriented. In a slightly imperfect example (as we will see later) I explain that there must be some form of matter that acts like a current. If we push a boat against a current the boat slows down, like the keys, and then moves back in reverse.

The next logical question is where the current is going and what happens to this invisible flow of matter travelling into the Earth, and I have to explain that it turns into normal matter there. The next question is why it heads towards the center of the planet. If we are sitting at a bar, I give the example of drinking orange soda through a straw. Low pressure is generated in the oral cavity causing the orange juice to pass quickly through the straw. Likewise, the transformation of ether into normal matter inside the Earth generates an ether vacuum that rapidly sucks in the surrounding ether.

### A BRIEF HISTORY

Ether has a long history, but it is sufficient to summarize the last 4 or 5 centuries. Newton (1642-1727) worked in a scientific context that tried to explain everything mechanically, including the gravity field, on which solution he also reflected on [6, 7]. The vortices of Descartes (1596-1650) had already influenced multiple generations of thinkers. The Swiss scientist Nicolas Fatio de Duillier (1664-1753), conceived of gravity as being caused by collisions with the planet of high-speed ether particles travelling in random directions in space, a concept reiterated by his fellow countryman, George Le Sage (1724-1803) [7]. The idea was based on the reciprocal screening effect of the planets against collisions with ether corpuscles. In Italy, negative observations [8] and assessments [9, 10] were carried out on a possible screen effect [11, 12]. Today the idea is sustained by some and known as "*Pushing Gravity*" [13].

Another Swiss, Johann Bernoulli (1667-1748), active with his son Daniel in the early stages of hydraulics, studied de Duillier's text and proposed an active ether, not whirling or chaotic, but with an orderly flow, directed towards the interior of celestial bodies, which he called the "*central torrent*", perhaps representing the first hydrodynamic conception of gravitation [14]. This rather incomplete outline influenced the continental scientific world, inducing Pierre-Simon Laplace (1749-1827) to sustain similar ideas.

The main issue that remained unexplained was where the ethereal fluid converging towards the Earth's core ended up. Bernoulli failed to resolve the problem. When Newton reflected on a possible inflowing ether, he felt obliged to postulate a problematic route back outwards, finally arriving after much thought at the famous phrase "*Hypotheses non fingo*". James Clerk Maxwell (1831-1879) made things even more difficult by proposing a fluid that followed Faraday's lines

of force, but only as an ideal fluid, not part of reality [15]. Bernhard Riemann (1826-1866) was even more confusing with his ether oscillating between a material state when outside of bodies where it gave rise to the force of gravity with its flow, and a state no longer material but only mental, ideal, once it entered solid bodies [16]. In this view, after ether fulfilled its only function, it had to disappear. A similar tenacious effort to avoid the materialization of ether persisted through time to Einstein, and on to our century [11, 12].

### **A HIGHLY SIGNIFICANT PARALLEL**

Dismay for the inability to explain how matter was injected into the planet through a centripetal stream of ether was mirrored in the disorientation of engineers and theorists in the nascent discipline of hydraulics and hydrodynamics in general. They had to explain the problematic entities of sinks and sources, into or from which the fluid ether would have to converge or spring at a velocity dependent on  $1/r^2$ , including an intractable singularity in the center where the velocity value became infinite.

None of the fluid dynamics treatises of the last century or even the present century examined by the present author offer a solution to the problem of final storage of the hypothesized incoming fluid. Sinks and sources remain unexplained and are dismissed as ideal entities with their central singularities simply ignored. The authors appear not to realize that by renouncing a causal explanation for the final (sinks) and initial (sources) elements in the process, the concrete fluid that engineers and physicists have to address their daily practical work also becomes ideal.

### **THE SOLUTION IMPLIED BY THE EARTH ITSELF**

The circulation of these ideas in the mid-nineteenth century induced a rift between those who did not believe incoming ether accumulated in celestial bodies, and those who considered the possibility. Not by coincidence, the few who were more open to the idea were mainly involved in the Earth sciences.

In America, the rector of Indiana University, Richard Owen (1810-1890), suggested an analogy between celestial bodies and growing biological living bodies [17]. This shows how the idea of celestial bodies being 'nourished' by something, as Newton had postulated in a letter to the Royal Society, remained an undercurrent in Western culture, even though there was no clear consensus in favor of the central stream hypothesis.

At the end of the nineteenth century, Ivan Osipovich Yarkovsky (1844-1902) [18, 19] went on to propose the idea of an *expanding Earth*, with the internal formation of chemical elements and earthquakes. The additional mass, or nourishment, was hypothesized to derive from a chaotic ether flow analogous to that of de Duillier and Le Sage. Yarkovsky's idea can be considered as a link between the concepts of de Duillier and Bernoulli. Accumulation and transformation of ether inside the planetary body would imply the formation of an ether vacuum, which would attract more ether towards itself, transforming De Duillier's chaos into Bernoulli's ordered motion. Connecting *pushing gravity* to an *expanding Earth* means dissolve the former while the fulfillment of the *central torrent* occurs.

In the two examples, in different theoretical domains from sinks or sources entities, the Earth was conceived as a storehouse of 'incoming nourishment' and consequently forced to increase in volume. Progress was not made in hydrodynamics, where sinks and sources remained characterized by unnatural singularities without being linked to an *expanding Earth*. In the geosciences, gravity and hydrodynamics still did not meet.

### STEPS FORWARD IN THE 1900S

Yarkovsky continued his research into ether in the following century. One of his papers from 1901 was entitled, "*The Density of Luminiferous Aether*" [20], but his attempts failed, producing excessive density values.

The first person to correctly integrate gravitation, the *central torrent*, and the *expanding Earth* was the Berlin scientist Ott Christopher Hilgenberg (1896-1976) [21]. He was aware of Riemann's work and criticized the idealistic claim that ether disappeared from the real world into a mental one [22]. Hilgenberg failed to accurately determine a value for the density of the ether, but he did understand the need to reference astrophysical data, making use of the redshift of sunlight. His self-published work was not widely circulated.

Other expansionists in the Western world enjoyed higher profiles than the Berlin researcher, but they were unconvinced that the flow of ether caused gravitation. Among the best known are the Australian, Samuel Warren Carey (1911-2002), and the paleontologist at the British Museum Natural History, Hugh Owen (1933- +). The former proposed a modified law of gravity [23, 24], while the latter explained expansion as the phase change of a super-dense terrestrial core of solar origin, expelled from our celestial body in a supernova event [25, 26]. Both were afforded access to prestigious publications, possibly because their ideas did not challenge the pillars of established western cosmological thought.

Over the same period some Russian authors (Neiman, Blinov, Kirillov) [12, 28] were published on the subject. They adopted different approaches (central or chaotic flows) but without consideration in the West due to the language barrier.

The history of the ether underwent a turning point between the late 1800s and early 1900s when it was realized that two of Maxwell's equations did not transition from one inertial system to another adopting Galilean transformations [29]. It was not understood that the crux of the problem was the persistence in ignoring ether. The outcome was the adoption of the Lorentz transformations.

### WHAT'S HAPPENING TODAY?

Today, experiments in fundamental physics have injected new vigor into the *central torrent* hypothesis. In Italy the *Borexino* experiment at the Gran Sasso laboratories, and in Japan the *KamLAND* experiment on the island of Honshu [30, 31], have measured the flux of neutrinos produced by the decay of radioactive elements inside the Earth. The decay produces heat and it was hoped to close without shortfall the Earth's thermal production balance, which is known to total 45-47 TW (Tera-Watt) measured in wells, mines and underground tunnels. The total should be the sum of the component elements: primordial heat + heat from radioactive isotope decay + heat from tidal friction (negligible). However, budget did not break even and a heat

source remains unidentified. The shortfall would be even greater if an *expanding Earth* theory was adopted, because much less primordial heat is envisaged in this model.

One attempt to account for the shortfall in the Earth's heat balance was to postulate natural nuclear fission reactions (an example was discovered in a uranium mine in Gabon). Similar spontaneous reactions might be found near the center of the Earth, or in zone *D*" between the core and the mantle. This idea is strongly countered by the argument that the accumulation of nuclear waste would rapidly shut down the reaction.

The missing heat source could derive from a transformation of ether flow into ordinary matter through processes as yet unknown [11].

### QUANTIFYING THE ETHER BY PLAYING BETWEEN EARTH AND SKY

*Expanding Earth* can provide a unifying solution to the problems outlined above. Earth science observations and data, combined with paleogeographic cartographic experiments for an *Expanding Earth* [3, 11] and the *Borexino* and *KamLAND* geoneutrino experiments [30, 31], indicate that ether plays a role in the evolution of the Earth, planets, and all other cosmic structures.

The addition of matter to the planet over geological time can be estimated by applying variable-radius paleogeography. Combining these estimates with geoneutrino detection data regarding the Earth's internal energy balance, and with the help of astrophysics (Hubble's law, classical gravitation around large masses, etc.), it is possible to calculate ether density, flow rate and velocity (details in [11]). It should also be assumed that the laws of hydrodynamics remain valid, with a hydrodynamic frictional force  $f = \rho qv$  being exerted by ether of density  $\rho$  on any sink or source having flow rate  $q$  and moving at speed  $v$ . Or vice versa, with ether at velocity  $v$  exerting the same frictional force on stationary sinks and sources. The force exerted between pairs of sinks or sources with flow rates  $Q_1$  and  $Q_2$ , at distance  $r$ , can be used to obtain a law of attractive force analogous to that of Newtonian gravity  $f = \frac{\rho}{4\pi} \frac{Q_1 Q_2}{r^2}$  [32]. At this point it is clear that the previous example of a boat pushed against a current, although similar by analogy, is imperfect since the boat is not comparable to a "sink" of flow rate  $Q$ .

Applying some algebra [11], it can be established that ether is very tenuous, with a density defined by the elegant formula  $\rho = \frac{1}{4\pi} \frac{H_0^2}{G}$ , giving a value of  $\rho = 0.64 \cdot 10^{-26}$  kg/m<sup>3</sup> ( $H_0$ =Hubble constant;  $G$ =gravity constant). Having established the density, the velocity field of gravific ether can be calculated (no longer a phenomenological field, but actually existing and acting at every point). On the Earth's surface it has a superluminal value, ten orders of magnitude greater than  $c$ . This enormous value was confirmed for an electric field in a 2015 experiment at INFN [33], with the authors interpreting the results as the electric field behaving rigidly, but a velocity much higher than  $c$  is a valid alternative interpretation. University textbooks on electrodynamics, rather offering a demonstration, simply define the velocity of field propagation as strictly equal to  $c$  (the figures in the textbook by Edward Purcell [34] are famous examples).

The awareness that material Coulomb fields can propagate at superluminary speeds (distinguishing field speed and self-induction wave speed), opens new perspectives in the possibility of explaining the hitherto mysterious entanglement phenomena.

### A NEW IMAGE OF THE UNIVERSE

The centripetal flow of ether and its conversion into ordinary matter within the Earth enables unification of the *expanding Earth* theory with hydrodynamic gravitation, explains the origins of cosmological and gravitational redshifts, and identifies interrelationships between the parameters of ether and the currently known cosmological parameters  $H_0$ ,  $G$ , and  $c$ . The "*tired light*" mechanism, much loved by the first astronomers studying the redshift-distance relationship (Edwin Hubble, Fritz Zwicky, and others), is back in vogue in a new version [35]. The dissipative force of the hydrodynamic friction of ether also exerts itself on light, absorbing energy and so decreasing frequency, resulting in redshift.

The dissipative term  $f = \rho qv$ , dependent on the relative velocity  $v$  between object and ether, is a non-Newtonian concept that requires a revision of the theories of physics and cosmology. Many laws universally accepted today, such as the Galilean principle of inertia, escape velocity, etc., should only be considered good local approximations of a more complex reality, in which the dissipative term becomes a major cornerstone of the Universe. Since the frictional term is a function of velocity, it exerts a damping, moderating, uniformizing action on the cosmos, while without it (without ether) gravitation would not exist and the universe would disintegrate. There could be no material bodies, since these are ether sinks.

Even more disconcerting for the habitual ideas of current science is that the *central torrent* does not foresee an upper speed limit, while at the same time prefiguring a new evolutionary vision of the universe without a *Big-Bang*. Theories of relativity (Differing from each other in how many variants?) thus turn out to be a curable infirmity of contemporary science. Numerous inferences favor both the *central torrent* and the *Expanding Earth* over other conceptions that line up with contemporary physics and cosmology [11].

### HISTORICAL AND CURRENT OVERVIEW OF CONTEMPORARY SCIENCE

The problem of non-covariant Maxwell equations under Galilean transformations have already been mentioned [29]. The impetuous nineteenth-century progress in electrodynamics, telegraphy, and electrical hardware ended up encouraging full confidence to Maxwell's equations, which were invariant under the Lorentz transformations. Rather than suspecting that these equations did not exactly describe the world, it was instead assumed that Galileo's transformations were inaccurate. The incompleteness of Maxwell's equations thus led to rapid progression down a path of fanciful relativistic ideas. The contemporary discovery of quantum phenomena, perhaps even stranger and more remote from common sense than the relativistic phenomena derived from Maxwell, further exacerbated the situation.

For a combination of political, military, and ethnic reasons, a coherent block of ideas and theories somewhat detached from physical reality, or that are ready to renounce further investigation, has become established over a number of decades. Examples might include some abdicatory tendencies in quantum mechanics, or the conventionalized fantastical ideas of relativistic theories, which led to the *Big Bang* and all its associated unresolved issues. Other

examples include the alleged existence of non-locality, daughter of action at a distance, which is nevertheless incapable of transmitting signals (An incredible concept: why would nature enable the *here and now* to influence the *there and now*, but without allowing transmission of signals? This is instead a rationale for the NON-existence of non-locality), and finally the creation of ancillary geosciences, which were expected not to rock the boat, but which are likely to be the starting point for change.

After a period of stagnation in General Relativity (GR) until the mid-1950s, a rapid and politically interested reassessment of GR followed [36]. In the post-war period, for obvious political and economic reasons (including control of the Middle East), the USA aspired towards becoming the leading guide and example for the world scientific community [37]. In addition to the various scientific factors that attracted the attention of insiders [38], it is the view of the present author that the victorious powers exercised widespread propaganda to ensure that relativistic theories, the paradoxes of quantum theory, and the "*let there be light*" Big-Bang arrived in every home thanks to skilled media popularizers (a process already underway since the 1920s; [39, 12]). Certain lines of research and cultural preferences were promoted above others, to the detriment, for example, of the search for material causes in fundamental physical processes. While there were no explicit conspiracies in this respect, simply supporting one idea to the extent of making it prevail is effectively equivalent to repressing rival ideas, without it being obvious that a form of censorship has been exercised. Terrestrial expansion concepts were assigned little attention, even though already well developed by Mantovani [40, 41], Yarkovsky [18, 19], Hilgenberg [21, 42] and others.

### SCIENCE?

After the Second World War, the unconditional support for relativities had various implicit motivations. Firstly, there was a perceived need to acknowledge the Jewish ethnic group after the extreme European racist ferocity (extending beyond the Nazis) by underlining their positive contributions in the form of scientific genius. Secondly, the cosmology of relativistic research painted a picture very close to our mythical-religious traditions, reconnecting to the historical precedents of Western cosmology, which until the beginning of the 1900s had been more an expression of religious-philosophical convictions than an application of physics [43]. Continuity was also maintained with the already noted tenacious refusal by Maxwell, Riemann, and successors to introduce the ether that was instead required for the explanation of Coulomb fields.

From the 1920s onwards, and more explicitly from 1955, an exciting "*let-there-be-light*" moment was proposed to the world, which would have a strong influence on the minds and philosophical reflections of all ethnic groups on the planet. An economic and political dominance was completed with the cultural, scientific, and mythological hegemony of Western ethnic groups over all others. An image emerged of the cosmos already dear to Christianity but born from the mind of an exponent of the Jewish people, almost a reciprocal accommodation. This image of the universe was also convenient for the post-war period because it helped alleviate the guilt of the first and only nation to use atomic weapons. Their miniature big bangs could be more easily justified if that was the way God operated too.

Great attention has been dedicated to the phenomena of entanglement, improperly and misleadingly referred to as non-locality. These phenomena are certainly very important for the technical progress of quantum computing, having recently been awarded with Nobel prizes. However, to blithely state that what happens here now instantly determines what happens hundreds of kilometers away is to believe, or try to inspire belief, in forms of occultism, with the implicit aim of leading science down the dangerous path of irrationalism. It is well known that Bell's Inequality (BeIn) [44], on which experimental research on entanglement is based, is obtained for pairs of particles with dichotomous variables, and that BeIn cannot be demonstrated for wave phenomena, which present so-called interference terms in their interactions, analogous to those that determine the interference fringes in the two-slit experiment and which nobody is surprised by [45, 46, 47]. Thus, instead of realizing that BeIn opens a window on the existence of material wave fields, the same old song is repeated, so that material fields are denied to this day, making it easier for idealists to soil science with the paranormal. As we have already said, the Coulomb fields can propagate at superluminary speeds overcoming the impossibility of explaining entanglement phenomena.

Finally, relativism has been widely dispersed through all the universities in the world by specific scientific societies [37], and combined with the indeterminism of quantum mechanics, it has become a formidable hammer against the determinism of the historical materialism so greatly abhorred (not without reason) in many contemporary philosophical currents, and against the dialectical materialism that spread beyond the Iron Curtain.

### **A SCHISM ON THE HORIZON?**

The last century seems to have been marked by a characteristic that has united many different human activities. In philosophy, attempts have been made to instill in professionals, students and the more educated population that truth is unattainable, or even does not exist, or is only a reflection of our thinking. In the field of politics, ethics and morals, the new means of communication of the first half of the twentieth century, primarily the radio followed by the press, and the potentates who controlled them for their own benefit, have succeeded in the unprecedented feat of making believe in very large sections of the population that the exponents of an ethnic group were not human beings, and that they could be subjugated and subjected to the most criminal oppressions, or even erased from the face of the earth with a final solution never before conceived.

The disintegration of realism has also marked the arts and it was necessary to expect that the sciences were no less. In fact, it is my opinion that the relativistic drift on the one hand and probabilistic indeterminism on the other in the foundations of science is certainly not accidental, and similarly for the prevalence of the "*Shut up and calculate*" emblem of promoting disinterest for true causes of phenomena as the guise of the typical professional physicist. The 20th century was therefore not "*the short century*" [48], but on the contrary "*the long century*", which also extends into our present century with its nefarious cultural effects. It could also be called "*the terrible century*".

The Western science that took shape after the Second World War was disconcertingly unilateral rather than democratic, appearing to be more or less consciously programmed to establish a position of unquestioned hegemony in academic institutions around the world. By absorbing it,

learners were expected to develop a high level of respect for a culture in which science had discovered that the origin of the universe reflected the mythologies handed down in its sacred texts.

Reshaping science around mythical-magical-religious foundations cannot bode well for the future, with the risk of falling into the typical patterns that have characterized the drift towards religious dogma throughout history. The situation of physics today resembles a pre-schismatic moment. On one side are those who believe in positive, experimental science, opposed on the other hand to those who are happy to lose themselves, innocently or purposefully, in the convolutions of mathematics [49] and the physical fantasies of immaterial fields.

### CONCLUSION

It is hard to predict how the scenario delineated above will play out. The only positive note in the current situation is that insiders have been habituated by relativities to consider Newtonian physics surmountable, a simple approximation of more complex calculations (even if those proposed remain unrealistic). This detachment from tradition might help facilitate a shift towards true non-Newtonian physics, with an engineering-hydrodynamic explanation for gravity.

A positive step in this direction is the contemporary recognition of analogies between fluid dynamics and Maxwell's equations [50, 51, 52]. It has also been conceded that by treating Coulomb fields as ether fluxes, the mass or charge of bodies can vary over time [53]. A work program should start by acknowledging that if electric fields change with motion ( $\nabla \times \mathbf{E} = 0$  for charges at rest becomes  $\nabla \times \mathbf{E} = -\partial \mathbf{B} / \partial t$  for moving charges), then the symmetrical crushing of the field in the direction of the velocity vector obtained by Heaviside (1888) [54] based on symmetry can no longer hold, since the ether would break this symmetry. The field configuration instead becomes that of the velocity field around a moving hydrodynamic sink in a stationary fluid.

Something concrete could get the more aware part of the research community and academia preparing students to consider the alternative ideas more seriously and without preconceptions, reflecting on the history of science, and clarifying its hidden philosophies. Enabling them to appreciate and recognize the eternal struggle between idealism and materialism. It is also essential that a key piece of the puzzle is allowed to fit into place: that the expansion of the Earth and of celestial bodies is recognized as part of physical reality. Other components of the necessary change might then more easily be accepted. The "*long century*" can be ended.

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