

The Muses of Science: A Utopian Oracle ¹

Jean-Marc Lévy-Leblond

TO: 9MUSES@muses.org
From: APOLLO.MUSAGETES@mount_olympus.gov
Object: Muse of science?

Dear Muses, my nine sisters,
Read this request mailed to me by Pythia.

TO: APOLLO.MUSAGETES@mount_olympus.gov
[FROM: PYTHIA@oracle_delphi.com
Object: Muse of science?

O luminous Apollo,
Brother and leader of the Muses,
Inspirer of my vaticinations,
What oracle can I respond to the mortals who query me as follows:

TO: PYTHIA@oracle_delphi.com
FROM: MUSEUM.SCIENCE@science_&_culture.edu
Object: Muse of science?

Darkest Pythia, Desirous that science might become for humans a source of wisdom and enlightenment, we wish to build to this effect an all-new edifice in which Science can be venerated and celebrated. But to which of the nine Muses should we dedicate this mouseion?

Dear Ladies, Companions, what answer can I make to our priestess at Delphi who requests inspiration for her oracle? No one among you, O Goddesses of poetry, song and dance, presides over science, the latest-born of human arts. Verily, before your number, names and duties were laid down, you were preceded by more ancient Muses. One of these was Polymathia, she who reigned over so many fields of knowledge and to whom science could have been confided. Alas, she is relegated henceforth to oblivion. But, all in all, in view of the risks that these new forms of knowledge imply for the gods as for mankind, perhaps it were better not to dissociate them from the actions and ideas you watch over already. 'Tis but four centuries since Humanity launched its quest to understand their world. This lapse of time, though brief, sufficed to swell their hubris to the point where, outdoing Prometheus, they now presume to rival Zeus himself and assume the mastery of cosmic lightning and of life itself. Would you, dear Sisters, in this new templum, wield the power to foster caution twinned with passion that mortals may breed sciences for life not death, for joy not pain, for peace not war? Let each of you herein display her gifts.

¹ My deep thanks to George Morgan for his literate translation of the French version as published in Jean-Marc Lévy-Leblond, *La vitesse de l'ombre (Aux limites de la science)*, Seuil, Paris, 2006.

TO: APOLLO.MUSAGETES@mount_olympus.gov
FROM: CLIIO@muses.org
Object: Re: Muse of science?

I, Clio the Renowned, eldest daughter of Mnemosyne, Muse of History, warden of memory, wish to teach men lest they neglect the past of their knowledge as of their ignorance. All too oft, these overbearing mortals thought to erase their memories and launch into a novel era. Yet how can one who knows not whence he came decide where he must go? Though fresh, this scientific knowledge has roots that reach down deep to ancient springs of wisdom, from which they draw their strength, much more than half-wise humans would believe. Those galaxies on high, billions of light-years hence yet nightly scanned by star-struck astronomers, received their name from the fluid the godly infant Heracles drew from the breast of Hera and which gushed across the heavenly vault in milk-white trails. That one sky-gazer, Galileo, four centuries since, perceived therein a myriad of distant stars has changed neither the image nor the name bestowed upon the Milky Way. And the electron, that faithful messenger of men, speedier and more versatile than our own Hermes, does it not take its name from our own amber (elektroⁿ) which exerts its mysterious attraction upon wisps of straw? Mankind would be presumptuous to believe, despite all their modern avatars, that these old myths have lost their power to charm. Relentlessly, I will remind them that the past holds the key that will unlock their present and prize open their future. And to those who persist in claiming for their science alone the power entrusted in them by the city, I will recall the tragedy of Dedalus, the once-loyal servant to King Minos and then his prisoner within the Labyrinth which he himself had built. And that same tale will serve as warning to those who dream they can transgress with impunity the frontiers between the diverse living species. Let the fearsome Minotaur put them on their guard, just as the fall of Icarus, prefiguring that of the Challenger shuttle, should alert them to the perils of unbridled pride among those who wish to reach out to the skies. And may those who believe they can neglect the demands of the city and devote themselves to the quest for pure knowledge learn the lesson from the great Archimedes who was slain at the sack of Syracuse for not having raised his eyes from his geometric forms. And I will ensure that the fecund straying of past sciences is not forgotten. As the poet Victor Hugo once wrote at my behest: 'O, what admirable wonder but this swarming pile of dreams engendering the real! O sacred errors, the slow, blind, holy mothers of the truth!' May History then in this Museum of Science receive its well-earned due— that science may continue to advance along its path.

TO: APOLLO.MUSAGETES@mount_olympus.gov
FROM: CALLIOPE@muses.org
Object: Re: Muse of science?

As Muse of epic poetry and Mistress of eloquence, I, Calliope of the Golden Voice, will beseech mankind not to forget their debt to language on the pretext that they have invented unprecedented signs to transcribe and transmit these novel sciences. I will enjoin them lest the stenographic formulae with which they inscribe their subtle mathematical ponderings, the complex graphs which plot their discoveries, and the abstract encodings whereby they convey their knowledge far and wide lead them to forget, once and forever, that it is in common parlance, the language of Everyman, that all intercourse begins and ends. That they may remain, or become once more, mindful of the words they choose. That they may banish from their discourse all vulgar terms when uttering their finest thoughts: crude onomatopoeias of the "Big Bang" ilk could ne'er evoke

the mystery that enshrouds the origins of all things. Nor could a cheese, a “quark”, however fresh, transcribe the ingredients of primal matter. And yet, conversely, may they refrain from veiling behind pointlessly sophisticated verbiage, inspired though it be by our own tongue, that divine language Greek, their reluctance to admit and to transmit these new ideas. And may they, the scientists, taking example from the bards, seek out such turn of phrase as will forever grave their findings in the memory of men. And, at very least, may the labourers in this domain be those who unstintingly shoulder the weighty task of sharing knowledge with the world. And may this mouseion, to which willingly I grant my patronage, welcome all the languages of men, that the Word be heard in all its rich diversity. After so many centuries, we too have learned to lend our ears to every tongue, as all are ripe with meaning. No man, no woman, whate’er the tongue their mother spake, is a stammering barbarian, and the science built by humans will ne’er attain humaneness till it be said and done in all their languages. Science must be many-tongued or else it were tongue-tied.

TO: APOLLO.MUSAGETES@mount_olympus.gov
FROM: ERATO@muses.org
Object: Re: Muse of science?

Source of all songs of love, I, Erato, the Beloved, muse of the erotic poetry that bears my name, am aware that humans, in their search for knowledge, discover the very pleasure of the quest for love. Libido sciendi is but a form of desire. Is Eros not the most powerful of all the gods, since Zeus himself is subject to his law? I will be watchful that, in the mouseion, homage be paid to him. Too often, from the burning mirrors of Archimedes to the warheads burgeoned at Los Alamos from nuclear physicists’ brains, Mankind has placed its new-found knowledge in the dire hands of War and Discord. Let no visitor to the temple forget this. Such memories alone will enable me to inspire in humans a love of knowledge in which Eros triumphs over Thanatos. For then tis a veritable erotics of Science that could emerge. For how could the most austere of scientific workers endure the ascetic life which is theirs if, in return, they did not draw unparalleled pleasure. How could the knowledge acquired by the zealots of science be shared with the common man if the joys of enlightenment were not also to hand? And the very life spring of that unquenchable curiosity which drives Man to delve ever deeper into the womb of Nature, is it so different from the thirst for knowledge which impels every human child to discover the nature of their being and that of the other sex? “Whence I came”, is this not the self-same question asked by infants of their parents and which relates to their mysterious mating as by astronomers who inquire into the birth of the cosmos and again by the biologists who study reproduction and the propagation of life? May these offspring, then, the fruit of that love whose songs I once inspired be welcomed in the mouseion as the most cherished of visitors and receive the respect and affection that Mankind owes to its own future.

TO: APOLLO.MUSAGETTE@mount_olympus.gov
FROM: EUTERPE@muses.org
Object: Re: Muse of science?

I, the bringer of delight, Euterpe, the Most-Pleasing, Muse of lyric poetry, my wish would be that this museum inspire in human kind deep pride in all the conquests of the mind, an admiration men have every right to feel for their own knowledge, imperfect and incomplete though it must

be. When, my dear sisters, we breathed into blind Homer the rhymes with which he sang the ire of fiery Achilles and the wanderings of guileful Ulysses, the world known to the Achaeans of ancient Greece stretched no further than the pillars of Hercules and their memory scarce a brace of centuries. Today, the universe accessible to man encompasses the lunar orb of night, mankind's machines traverse all space in quest of distant worlds, which none in ancient times had e'er perceived, and messages are captured from the most distant realms of space. There, at the heart of matter, where the boldest thinkers of the ancient world, Democritus, Epicurus and Lucretius, could no more than imagine the atoms that constitute all things, within a score of years the physicists have learned to observe them, nay, even measure them. Pushing beyond their supposed indivisibility, scientists have peered into the inmost motions of the atom and harnessed its energies. Like Prometheus reborn, they have now enslaved the atomic fire which burns within the centre of the Sun and have turned it now to human—and, alas, too often, to inhuman—ends. Life itself no longer escapes the grasp of the arts and crafts of science. The monstrous Chimeras have fled mythology and now haunt workshops and laboratories from which, e'er long, new Galateas will blossom into life. Indeed, this museum must be a place of wonder and awe. May it home to the admiration and the fear that Mankind owes unto itself.

TO: APOLLO.MUSAGETES@mount_olympus.gov
From: MELPOMENE@muses.org
Object: Re: Muse of Science?

Goddess of the stage and choirs, I, Melpomene the songster, Muse of Tragedy, my wish is that this temple of science be also a theatre. That on its stage be played the eloquent dramas which punctuate the search for knowledge. As with the quest for power, it is through tragedy that Everyman will understand and draw the lessons from such terrifying episodes. It is through Science, is it not, that the eternal hubris of mankind unfolds today? The dangers hanging over humanity, which erstwhile were the work of earth and sky, are now of their own making. Oedipus was blind to the warnings of the oracles, took pride in having unraveled the enigmas of the Sphinx and cast himself into his tragic destiny, bringing down misfortune on the city of Thebes. May this lesson not be lost on modern man whose science has no equal but his recklessness. Galileo, Oppenheimer, Sakharov, so many pathetic heroes, victims of tyrants whom they thought to outdo in cunning, but whose fall dragged so many innocent victims in their wake. May the successors of Aeschylus and Sophocles, as some have already done, like Brecht for instance in whom I inspired a superb Life of Galileo, continue to delight the world with dramas in which the hearts and minds of people will be moved by the catastrophes wrought by conscience-less science. May a healthy catharsis allow them to recover moderation and caution. Yes, in the amphitheatres of this new museum, on stage or on screen, I will endeavour to ensure that none forget the tragic dimension of science.

TO: APOLLO.MUSAGETES@mount_olympus.gov
FROM: POLYMNIA@muses.org
Object: Re: Muse of science?

I who inspire the melodies of voice and instrument, Polymnia of the many-hymns, preside over the harmony of ideal forms. Goddess of Music I am also Muse of geometry. And so this art and this science, from the earliest times, have been intimately intertwined. Was it not when sounding

the chords of a lyre that Pythagoras discovered the world was governed by numbers? Did not the music of the spheres resonate for centuries, opening up the cosmos to astronomers like Kepler? And was not music twinned with mathematics in D'Alembert's equations, in Fourier's integrals and in the wavelets of the moderns? Does the fact that scientists today use radio rather than sound waves to eavesdrop on the universe really change anything in their hunt for harmony? The atoms themselves are structured, are they not, around the precise resonance of quantum waves? May this bond be a lasting source of inspiration in our new museum. The harmony of sounds, as of visible forms, will enable the sciences to reach both the spirit and the heart of laymen through their eyes and ears. Several of my sisters will be vigilant lest the quest for Truth be separated from that for Good. I will ensure that this search remain forever inseparable from the pursuit of Beauty. Were Science to shed its esthetic dimension, it would quickly wither and Everyman would turn away, as from some barbarous idol.

TO: APOLLO.MUSAGETES@mount_olympus.gov
From: TERPSICHORE@muses.org
Object: Re: Muse of science?

I, Terpsichore, Muse of dance, She-who-delights-the-choir, reign over grace of movement and balanced motion. For men and women do not possess a body, they are their body, as I once whispered to Wilhelm Reich. And so, no human activity however abstract, can seek to neglect this physical embodiment. Another of my initiates, Frederic Nietzsche, realised this too, he who demanded of philosophy that it should learn to dance if it is to fulfil its task properly. Likewise, Science cannot be an exclusively mental undertaking, the work of mind alone. It requires the attention of the observing eye, the skill of experimenting hands, the suppleness of limbs to orient instruments, a stable posture and bodily stamina. Investigators as they construct their devices must perfect their gestures, control their movements. Galileo and Spinoza must have been paramount polishers of lenses before they grew into, nay! that they may become, great thinkers. Spallanzi swallowed a sponge which he then withdrew to study his gastric juices, just as J.B.S. Haldane tested narcotic gases on himself before administering them to his guinea-pigs, not to mention the throngs of chemists who tasted and smelled so many nameless substances! All bear witness to the bodily risks taken in the service of the mind. And the collective experiments which are currently the rule demand of scientists that their movements should be as synchronized and precise as a choreography. It follows therefore that a museum of science must grant to the body the place it deserves. Knowledge passes through hands and eyes. The dual reference of the word "physical" is no mere coincidence. The natural dimension to which it alludes is both that of the world that surrounds us and that of the body through which we belong to the world. In this museum-to-be, may visitors be able to touch, caress, palpate, and hold both materials and living creatures. And throughout their bodies, may they feel earthquakes, electric discharges and other simulated phenomena. May the space be designed to allow the play of movement and graceful motion.

TO: APOLLO.MUSAGETTE@mount_olympus.gov
FROM: THALIA@muses.org
Objet: Re: Muse of science?

I, Thalia the Abundant and Muse of comedy, who arouse laughter and gaiety, wish to instil in this museum a much-needed and salutary reaction to the gravitas which too often presides over

the world of science. I doubt not that several of my sisters will take care to stir within the visitors to the museum feelings of admiration, fear, enthusiasm, attentiveness and caution in the face of knowledge. However, without laughter to define the limits and relativize the scope of science, the latter, all too human, would run the risk of being raised to the status of a divine activity. For years untold, I have attempted to warn against the foolishness of unbounded idolization of scientific knowledge. 'Twas I who inspired the Thracian servant girl to laughter when she witnessed her astronomer master, his eyes fixed upon the stars, tumble into a well he had not seen at his feet. I who inspired in Rabelais and Molière their salubrious taunts aimed at learned ignoramuses. I again who urged scientists to mock themselves. Such a one was the great physicist Niels Bohr who, upbraided in his country home by a dour guest for having nailed a horseshoe to a wall, responded that – of course he did not believe in the power of lucky charms but that, luckily, they were just as effective even when not believed in. 'Twas I once more who enabled Italo Calvino to pen those epistemological yet comic novels *Cosmicomics* and *Time and the Hunter and I*, finally, who undo the pretentious claims of science to be a definitive all-encompassing method by having scientists progress so often by the serendipitous irony of unexpected discoveries. My prayer is that in this museum the formidable majesty of the sciences be tempered by the echo of unfailing laughter at their all too human failings.

TO: APOLLO.MUSAGETES@mount_olympus.gov
From: URANIA@muses.org
Object: Re: Muse of science?

Messenger of the stars, Urania the Celestial, muse of Astronomers, I alone perhaps among my sisters will feel immediately at home in this new museum. Am I not the only one of the muses to devote myself to a true science, one that is modern and yet ancient? In no way do I lay claim to any form of ascendancy, but how could I forget that the science of the heavens over which I reigned in centuries gone-by carried other functions than that of knowledge alone, functions which, moreover, still survive today. For my duties are not limited to presiding over astronomy, the laws governing the stars, but extend to all forms of discourse related to the stars and planets, namely astrology. Contemplation of the stars by humans in the ancient world was not merely a quest to fathom their movement and their nature. Their aim was ever to decipher the enigma of their being in the world. Today, far beyond the simple-minded illusion that our whole destiny can be contained within a horoscope, and beyond all mathematical equation and formulae, it is still the very meaning of existence that modern cosmologies seek to unravel. Where do men come from? Where are they destined for? Such are the timeless metaphysical question which emerge and reemerge between the lines of the reassuring answers delivered by the science of astrophysics. My role in this museum will be to keep alive the flame of this pursuit. As the oldest among the sciences, astronomy demonstrates that none, short of perishing, can cut themselves off from the roots which reach into the depths of the human soul. The more brilliant the enlightenment of science, the more somber the darkness it leaves behind that which remains opaque to it. But, as Olber's paradox claims, stars should shine in every point of the nocturnal sky, setting the night ablaze. Fortunately, according to the insight I first inspired to Edgar Poe, most of these stars are not yet visible, leaving the night-sky dark. Just so, science without propitious obscurity would dazzle more than it could illuminate. Dear Apollo, our leader, and you, my sisters, let us recall that each of us impels one of the celestial spheres that float among the visible stars and to all of which I lend my song. Jupiter is given soul by Terpsichore, Venus by none other than Erato, Mars by Polumnia, Mercury by Euterpe, the Moon by Thalia and the Sun by Melpomene,

whilst I quicken the entire starry vault. But henceforth, mankind has added other planets in the heavens: Uranus, Neptune, Pluto, and so many others now circling other suns. Rather than await a second choir of muses, let us accept to broaden our domain and take in trust these new-found stars, just as we accept the new missions that this all-new museum places upon we Muses.

TO: 9MUSES@muses.org
FROM: APOLLO.MUSAGETES@mount_olympus.gov
Object: Re: Re: Muse of science?

My thanks, dear Sisters, for your thoughtfulness to humans and their sciences.
I know henceforth what oracle I must dictate to Pythia.

TO: MUSEUM.SCIENCE@science_&_culture.edu
From: PYTHIA@oracle_delphes.com
Object: Re: Muse of science?

Re: All-new museum: all muses renew