The function of teaching of grammar as a crucial element of military policy

by Lyndon H. LaRouche, Jr.

Former candidate for the 1980 Democratic Party presidential nomination, the writer of the following, Lyndon H. LaRouche, Jr., is among the most outspoken and controversial among contributors to the military-policy debate now raging within and outside the Reagan administration.

The writer's general point of view, in all of the articles of the current military-policy series, is that the leading NATO circles are attempting to parody the Nazi Germany military policy of 1933-45, to the degree of deploying slightly updated and nuclear-armed versions of the Nazi V-1 and V-2 (the cruise and Pershing) as the characteristic elements of NATO posture. The transformation of Atlantic Alliance nations into "postindustrial society" wreckage, through U.S.A. support for the dogmas of Professor Milton Friedman, Representative Jack Kemp, and Paul A. Volcker, is a mere parody of the policies of Nazi Finance Minister Hjalmar Schacht under, inclusively, Chancellors Brüning and Hitler. NATO policy-makers have insisted that military policy must be subordinated to the effects of such a neo-Schachtian policy for the U.S.A. et al., obliging themselves to adopt a parody of Hermann Goering's "Guns Instead of Butter" doctrine of arms and operations.

The writer proposes a return to a "traditionalist" military doctrine. He proposes that the technology of warfare be defined in respect to a reference-policy of "Manhattan Project"-scaled, broad-spectrum development and deployment of relativistic plasma-beam anti-missile weaponry, combined with the strengthening of the civilian-economic agro-industrial basis for in-depth logistical, mobility, and personnel features of military capabilities.

In the course of the series of articles outlining this proposed change in policy, the writer reaffirms the continuing relevance of the traditionalist republican military science of Alexander the Great, George Gemisthos Plethon, Leonardo da Vinci, Niccolò Machiavelli, Gottfried Leibniz, Lazare Carnot, and the Prussian state reforms of 1809-10.

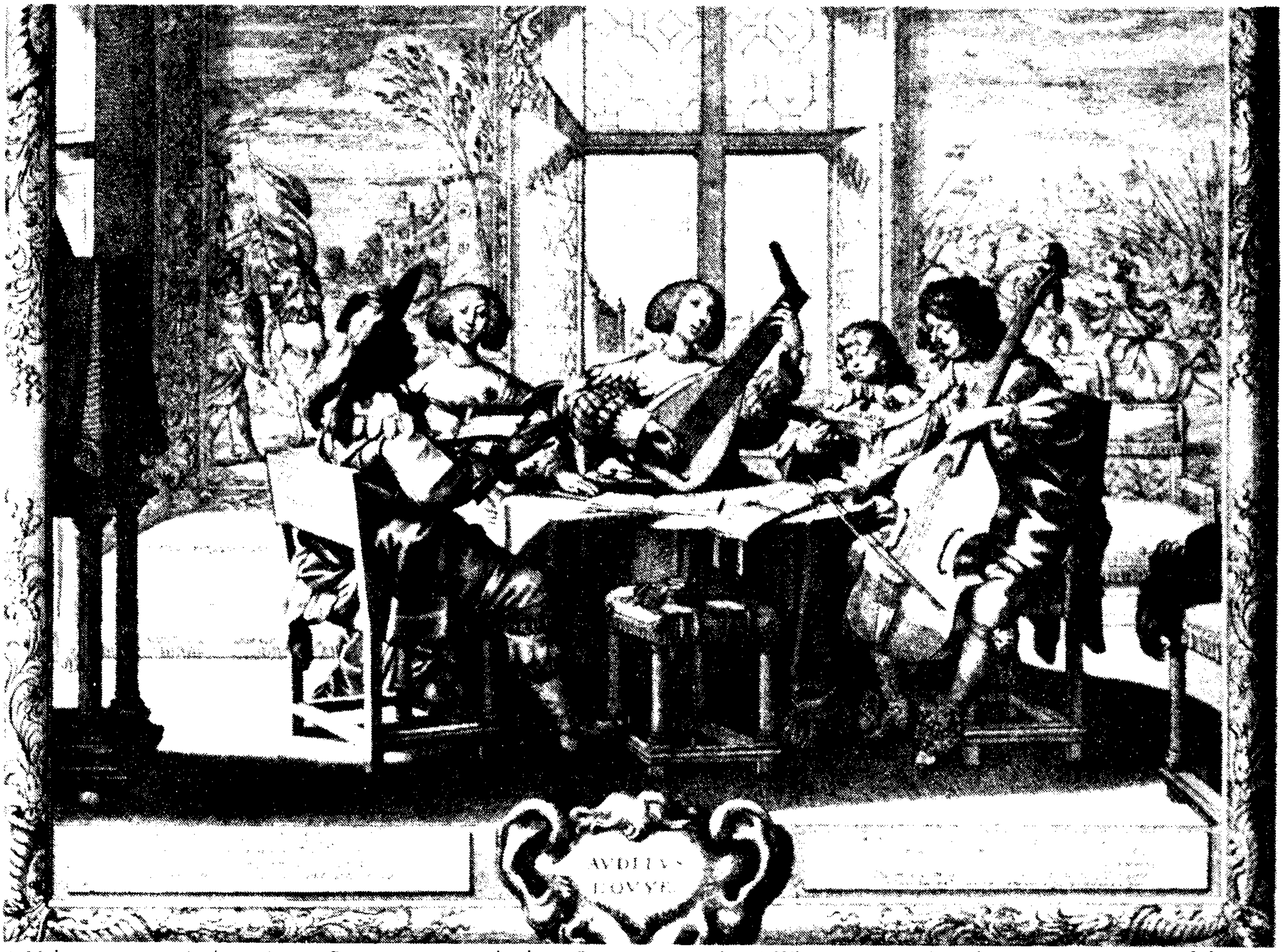
In the following article of the continuing series, the writer concentrates on a crucial, included feature of the Prussian reforms: the decisive role of classical philology in promoting the quality of science and citizen-soldier essential to in-depth capability in arms.

During a mere several years, circles under the direction of Lazare Carnot developed the expanded industrial basis needed to support what was, for that time, unprecedented rates of mass production of improved, lighter, more mobile field artillery. Around the change in battlefields implicit in a mobile base of massed artillery-fire, Carnot et al. effected a correlated transformation in the development and coordinated deployment of arms of battle.

What Carnot demonstrated to all with the comprehension to recognize that fact, is that the leading role of scientific progress, in defining qualitative advances both in arms and in the logistical, civilian basis, is the essence of all proper military science. This was recognized by the Prussian reformers, who coopted first (1809-10) Carnot's military doctrine, and later (1815-23) Carnot himself, to shape the development of Prussia's 19th-century strategic capabilities.

However, the Prussian reformers did not merely emulate Carnot's reforms. Through the Humboldt reforms in education, reforms based on principles of classical philology, they ensured the superiority of German science and fostered a superior quality of officer among both professionals and trained reserves.[1]

For reasons adduced from study of the Humboldt reforms, it must become U.S. national-security policy to demand immediately certain critical reforms in education at primary, secondary, and university levels. These re-



A 16th-century musical evening in Paris: engraver Abraham Bosse captioned it, "When one considers the infinite sweetness of the sounds of music and their many combinations, it is not without reason that it is said that the harmony of movement of the heavens gives order to the universe."

forms must be informed by understanding of the proper role of principles of classical philology in promoting not only the general moral and intellectual potentialities of the young future citizen. Special, included emphasis must be made on the connection between principles of grammar and the development of the student's mathematical potentialities.

Although the following outline takes into account work done by scholars, including the writer's wife and Uwe Parpart, on the Humboldt reforms as such, the analysis also takes into account discoveries accomplished by Bernhard Riemann and others later than Humboldt during the 19th century, and the relevance of those principles to problems of plasma-physics research today.

Grammar as such

To the best of our present knowledge, the explicit connection between grammar and mathematics was first documented by Leibniz,[2] a connection later stressed by such students of the classical philology of Wilhelm von Humboldt as August Boeckh.

Any language developed as a literate language has neither more nor less than 7 grammatical cases, com-
or, defective form of language. Any person lacking
bined with neither more nor less than 180 distinct forms for expressing verbal action in respect to subjects and objects defined in terms of those seven cases. In other words, the grammar of any literate language has in and of itself 1,260 grammatical degrees of freedom, situated within a user's rigorous command of vocabulary of between 50,000 and 100,000 terms.

Any form of language lacking those rigorously defined degrees of freedom and vocabulary is an inferi-

[1] For a broader view of the Humboldt reforms, see Helga Zepp-LaRouche's article, "Die Modernität des humboldtschen Bildungsideals," in the forthcoming September 1981 issue of the magazine *Ibykus* (Wiesbaden, West Germany).

[2] Uwe Parpart of the Fusion Energy Foundation has emphasized this connection. Parpart also pointed out August Boeckh's emphasis on this connection to Karl Jacoby.

command of the powers of a literate language is to a corresponding degree functionally illiterate, and incompetently educated.

The classes of objects of verbal action in language are neither more nor less than three: *subject, direct object,* and *indirect object.* These three elements of grammatical cases are configured either as *terms, phrases,* or *clauses* of speech, each of which is discriminated in that statement in either a *nominative, genitive, dative,* or *accusative* case-form. This defines for any literate language neither more nor less than seven cases:

Case	Object
Nominative	Subject
Genitive 1	Direct Object
Genitive 2	Indirect Object
Dative 1 (direct action)	Direct Object
Dative 2 (indirect action)	Indirect Object
Accusative 1	Direct Object
Accusative 2	Indirect Object

These cases are discriminated within the use of literate language by a combination among either inflection or aid of prepositions.

In misinformed teaching of grammar, the terms, phrases, or clauses of cases are misidentified as *substantives,* in the sense consistent with the Aristotelian syllogism. Exactly the opposite function is properly performed by such parts of speech. The *verbal action,* to which we turn our attention next, is the true substantive of literate speech. It is from that standpoint, and only that standpoint, that the proper connection between literate language and mathematics can be situated.

The first feature of the verbal action is *tense.* There are only three primary tenses, *past, present,* and *future.* The primary tense distinguishes the time at which an *ongoing, completed,* or *previously completed* occurrence is a *condition of action.* Such a condition of action of these times can be neither more nor less than *continuing, completed at that point in time,* or *completed prior to that point in time.* There are neither more nor less than *nine tenses* in a literate language.

These tenses of verbal action can be expressed in either of *two voices* (active, passive), also as either *self-reflexive* or *not-self-reflexive* action, in a choice among neither more nor less than *five moods.* The moods are *indicative, imperative, conditional, subjunctive,* and *conditional subjunctive.*

Hence, verbal-action can be discriminated in $9 \times 2 \times 2 \times 5$ distinct ways: 180 ways and in respect to 7 cases: $7 \times 180 = 1{,}260$.

Any language whose usage does not satisfy those most-basic grammatical requirements is a defective language. Any person whose use of a literate language does not efficiently command those grammatical features is to that degree a functional illiterate.

The development of grammar

The normal form of rigorous use of language is the classical poetic composition, as associated with principles which Western European languages have learned chiefly from the classical Greek. By classical Greek, one means properly the progression from Homer's *Iliad* and *Odyssey* through the dialogues of Plato. To understand the composition of literate prose, prose must be viewed as the principles of poetic composition projected upon the prose-line.

The metrical features of classical poetic composition have two mnemonic aspects. First, the metrical organization of speech is key to the user's efficient memory of passages. Second, the ordering of syntax according to subject-matter of lines within a stanza links passages to their properly intended antecedents within the entire composition, a second aspect of the mnemonic potentialities of poetic composition.

The requirements of poetic composition thus determine the proper evolution of the syntactical conventions of ordering of grammatical parts of speech, under the governance of classical poetical principles of composition. The task assigned to poetic composition is determined by the kinds of ideas to be communicated. In this way, poetic composition serves as the most efficient means for bringing the usages of a literate language into agreement with the reality of society's domain of practice.

The principles of poetic composition cannot be fully understood except from the vantage-point of an assimilation of the principles of well-tempered counterpoint. For related reasons, literate persons characterized by immersion in the music of Bach, Mozart, and Beethoven will most probably be qualitatively superior as productive scientists, when compared with a scientist with a comparable technical education but less attachment to such music. The case of Johannes Kepler is the "Rosetta Stone" of preferred choice for proving and understanding this connection.

That point will enable us to close the circle in this report. Kepler's work brings us directly to uncovering the deeper connection between literate language and mathematical powers.

Principles of music

Classical musical composition, since no later than the classical Greek period, has been based on the well-tempered system outlined during the 10th century A.D. by al-Farabi, and elaborated during the 16th century by the greatest musical theoretician of modern times, Zarlino. This classical musical composition rests on three interconnected and unchangeable facets: first, the principle of modulation in a 24-key domain; second, the principles of metrical composition of classical poetry; and, third, the principle of polyphony.

The argument for a "natural" scale is absurd. Human beings are neither vibrating strings, wheezing tubes, nor reverberating gongs. *Human music*, as opposed to the bestial "rock," is based harmonically on the principles of development. To modulate lawfully within a 24-key domain requires that all of the absolute and interpolated tones of each key have the same tone in each key as in all the other 23.

For elementary geometric reasons, such modulation must be ordered among keys according to a sequence of fifths, a geometrical principle which rigorously defines the necessary values of each of the 12 tones of an octave-scale by a unique geometric projection.

The elaboration of music within that 24-key system (domain) is ordered metrically according to classical poetical principles. This governs the definition of measures and time-signatures of passages. It governs the metrical elaboration of the tones constituting the underlying modal sequence of a thematic statement, which statement is equivalent to a line of poetry.

Development in musical composition is affected either through explicit polyphony, or the projection of a polyphonic elaboration of development upon the line of a single voice. It is polyphonic development which is the ordering-principle of musical composition.

Contrary to commonplace musical miseducation since (for example) Rameau, the harmonic structure of musical composition is not primarily "vertical" (chords), but "horizontal." Look at the vicinity of the first beat of coming-in of the second voice in a simple canon. At that point, we have more to consider than the sequences of tones within each of the two voices. The tone of the first beat of the second voice is, for example, in implied sequence to the preceding and following tones of the first voice, and so forth and so on. It is these "cross-voice" sequences of polyphony which are the point of reference for musical development.

Once Beethoven took up mastery of the writings of Zarlino, a study dominating Beethoven's work from about 1819 onwards, his composition developed new dimensions of power, developing a general, new form of double-fugal counterpoint exemplified in the late string quartets and the *Missa Solemnis*. The associated feature of his behavior during this period was his increased attention to writing canons, using these exercises as means for new refinements in redesigning thematic material. In brief, study of the kinds of cross-voice relationships generated by canonical elaboration of thematic material exposes to the insightful composer what modifications of thematic material will result in the most interesting problems and opportunities for elaborated development of an ensuing composition.

The significance of these principles of composition for locating the implicit mathematical powers of literate language is our point here. The few bare remarks submitted on music so far are sufficient to locate the connection to Kepler's work.

'Harmony of the Worlds'

By successive inscribing and circumscribing of the series of Platonic solids with respect to spheres (e.g., ellipsoids), Johannes Kepler determined the necessary ordering of the solar orbits. The geometrical proportioning of the orbits Kepler proved to correspond to the principle of modulation by fifths in music.

The gross misrepresentation of Kepler's work usually afforded to students is that Kepler was engaged in fitting various geometric figures to the array of astronomical data accumulated by adding his own observations to those of his predecessors. That commonplace representation of Kepler's discovery is utter nonsense, and an outright lie if it issues from the mouth or typewriter of anyone who has actually read Kepler's writings.

The devastating point of crucial experimental proof against the commonplace classroom and textbook commentaries on Kepler's work, is the case of the asteroid orbit. On the basis of his geometrical series, Kepler reported the former existence of a decomposed planet in the position we now know as the asteroid belt. This belt was not known to astronomical observation until Karl Gauss recognized that the position of a small planetoid, later named Ceres, belonged to the missing-planet orbit earlier defined by Kepler. That, together with much other evidence to the same effect, indicates that the lawful organization of the universe is ordered in the geometrical fashion Kepler represented, and not in the sort of schemes associated with Descartes, Newton, Cauchy, and Maxwell.

The view of the lawful ordering of the universe identified with Kepler was directly adopted from Kepler by Leibniz, who elaborated Kepler's proposal for development of an integral calculus on the basis of extensive studies of Kepler's work in general, as well as that specific proposal. This was the basis for the crucial work of Leonard Euler, and the entirety of the approach employed by Gaspard Monge and Lazare Carnot to develop the foundations of modern thermodynamics and the theory of functions. This was also the basis for the method of Monge, Carnot, Gauss, Jacobi, Dirichlet, H. Weber, B. Riemann, K. Weierstrass, and G. Cantor, although not that of such German Cauchy allies on method as Kronecker and Dedekind.

The fact that the geometrical determination of universal laws of Kepler, Leibniz, Riemann, et al. is congruent with well-tempered polyphony, as Kepler adduced this, is the preferred "Rosetta Stone" for uncovering the inherent powers of literate language as a mathematics.

This connection is crucial for understanding the significance of the Humboldt reforms, and for understanding that the entire primary and secondary curricula of public education ought to be based primarily on classical philology, poetry, music, geometry, and the grounding for student's mastery of a science of universal history. This is to say that literate language is composed of facets including poetry, music, and geometry. The development of mastery of all these facets and their interconnections is the full development of the mental potentialities for reason of the future citizen. The subject to which the student should apply those developing powers of literate language is a study of universal history, including geography and technology, as the primary reality which conscious thought, embodied in language, must master for practice.

Geometry

The geometry which the student must master is not the Euclidean axiomatic schema, nor any formal non-Euclidean schema based on substitute axioms and postulates. The student must begin, so to speak, with discovery of the elementary fact that a line is not determined by two points, but rather a point is a region of ambiguity defined by the intersection of lines. Similarly, a line is a region of ambiguity defined by intersection of surfaces, and a surface is a region of ambiguity defined by intersection of solids.

The generalization of this approach to geometry is what Leibniz termed *analysis situs,* and what is termed *topology* since (putting aside axiomatic topologies as brain-damaging misconceptions of topology).

From that vantage-point it becomes rather simple for the student to discover that the kinds of ambiguities associated with points, lines, and surfaces in rudimentary geometry are also what topologists and physicists term *singularities,* and that points, lines, surfaces, solids, etc., define respectively distinct species of singularities, ordered in ascending geometric degree.

Once that is understood, the secondary-level student ought to be enabled to recognize that a literate usage of language is nothing but such a geometrical mapping of reality, but such a form of topology.

The objects of speech (subject, indirect object, direct object) are not self-evidently particulars, but are regions of physical space within which perfect connectivity exists for the discriminated forms of verbal action. The combination of all of the qualifying statements in case-form within a unit statement define bounding conditions of singularity, which delimit the verbal action of the statement as a whole.

Any statement corresponding to the real universe's ordering, given in literate form of language, is a statement of transformation, accounting for a transformation from n degrees of freedom either into a condition of $n + m$ or into $n - m$ degrees of freedom. If the change in degrees of freedom is *actual,* then the verbal action is *transitive.* If not, the transformation is merely *virtual,* and we customarily view such transformations as *intransitive* verbal actions.

Statements concerning God

Once such background-knowledge is possessed, science begins with rigorous examination of statements concerning God. Let us first situate the problem as a grammatical one.

Let us begin with a critical examination of the statement, "I am." This statement is not cured of its grammatical defects by altering it to become "I am myself." Is the speaker registering in the *active* voice ("I am that respecting myself which I make myself to be") or the *passive* voice ("I am what I am made to be")? The former is a *self-reflexive* statement in the active voice, equivalent to "I create myself" as the alternate, active form for "I am myself." The second is a *passive* statement (geometrically) in the *not-self-reflexive* form.

Try, in this light, the statement "I am only that which I make myself to be," as the significance of the statement, "I am that I am," whose name is otherwise unutterable, as consistent Judaism has it and as Christianity appropriates this conception of God from Judaism.

This statement is topologically a report of the highest order of unity possible in the universe. Whatever degrees of freedom exist in the universe as a whole, they are reduced to a perfect connectivity in terms of this unity.

In physics, this involves a conception which B. Riemann associates with Dirichlet's Principle.

Define the simplest kind of mathematical function in the following way:

$$a_n x^n + a_{(n-1)} x^{n-1} \ldots a_0 x^0 = 1.$$

For which the coefficients ($a_n \ldots a_0$) are each integers and $a_n \neq 0$, and for which x^j has the included significance of designating the j-th order of degree of freedom in terms of geometrical species of singularities.

We have then stated the simplest notion of functions relative to the case of defining a corresponding, relatively higher unity within which perfect connectivity exists.

In literate language this act of integration to define a higher species of reality is located in the transformation associated with the principle of verbal action. The form of verbal action which subsumes all verbal actions corresponding to true statements in the universe, is the form of transformation which corresponds to the perfect, corrected self-reflexive form of "I am." This verbal action is otherwise unutterable in language as existence and of itself, except as the universe is viewed as a continuing creation, so defined as such in terms of a principle of self-generation, describable as a principle of transformation associated with progression from any existing order n into a higher order $n + m$.

The notion is precisely the root of the notion of perfect consubstantiality of the Trinity in Apostolic

Christianity (e.g., the opening verses of the Gospel of St. John) and in correlated writings of Philo Judaeus of Alexandria. The universal principle of verbal action is termed the *Logos,* which is consubstantial with the self-perfecting unity.

This was Kepler's standpoint, in adopting the principle of Augustinian Christianity, that the discovery of the geometrical ordering-principle consistent with the geometric-mean relationship of "divine proportion" is the test of discovery of a manifestation of the lawful ordering-principle of continuing creation. This is the key to Leibniz's entire scientific method, and is also explicitly B. Riemann's treatment of what he named Dirichlet's Principle.

The fallacy of arithmetic algebra

The opposing view of physics is the hermeticist argument against Kepler by Fludd, otherwise at the bottom of the fallacies of Descartes, Newton, Cauchy, Kronecker, Maxwell, et al. This defective view starts with the assumption that either irreducible particles are self-evident existences or, more skeptically, that in the appearance of the universe accessible to human knowledge, the universe must never be represented to appear as if it were organized in any form contrary to the axiomatic Descartes-Newton assumption.

The ordering of geometry in the manner of Euclid's text relying upon axiomatic-postulational assumptions, or any analogous construction employing different postulates to form a non-Euclidean geometry, is the form in which the defective, hermeticist-cult doctrine of Descartes, Newton, Cauchy, and Maxwell is reflected in formal geometry.

The second law of thermodynamics, for example, rests entirely upon that same arbitrary assumption: that the universe is fixed at n possible degrees of freedom of organization, and that only devolution from n to $n - m$ degrees of freedom is possible (entropy), or that, the same thing, the universe is like a clock winding down (Newton). This is otherwise, theologically, the Manichaean cult-dogma slightly disguised, an explicit rejection of the Apostolic Christian and Philo's Judaic conception of the ordering of the universe.

In the real universe, contrary to the Second Law's hermeticist cultism, we can create transuranic elements beyond the degree of elements previously existing in the universe, on conditions that our mode of attempted action to this purpose is coherent with the Logos-principle.

A correlated experimental proof of our point is readily accessible to anyone who takes the trouble to turn his eyes upward on a clear, starlit night. If the universe were infinite, then, except (chiefly) for those singularities named "black holes," the night sky would be a bowl of light more intense than that of the daylight orb of the sun. The universe is finite. Caught between that larger finiteness and the lower bound of the Leibniz-Planck quantum of least action, the highest number required to count the universe's quanta of action up to and including any instant is a finite number definable in the sense Archimedes outlined for this case.

This signifies that the smallest number locatable as ontological actuality between any two points of the number-line is implicitly defined by a function associated with the largest integer counting the universe up to this instant. Therefore, the assumption that the interval between two points on a number-line can be made infinitely small is an absurdity. (The general proof of that need not be elaborated here; the conception of the implications of the proof is sufficient for our purposes.)

In any case, all integers count nothing real excepting singularities. *Singularities* of real processes, and all numbers not integers (or not normalizable as integers) are reflections of geometrically-determined proportions. Although no perfectly adequate projection of the distribution of prime numbers is yet known, the Euler-Riemann attacks on this problem, as well as the implications of the convergence of arithmetic and geometric means in a Fibonacci series, are collateral expressions of the ontologically geometric characteristics of all meaningful arithmetic statements.

In actual mathematical operations reflecting the actual ordering of reality, we merely substitute symbology for statements otherwise better understood as to origins when rendered in a bulkier literate language-statement. Once that connection between literate language and symbolic language is adequately understood, the danger of a student's metaphysical folly of attributions to mathematical statements is greatly minimized, at least.

Conversely, for reasons we have summarily identified here, the command of a literate language equips the graduate of secondary-school education with a potential for a mathematical literacy functionally far superior to that the same student would have acquired if his education to that point had been directed to assimilation of "mathematical skills."

Mean and ignorant policy-influentials delude themselves and do grave mental damage to the potentialities of youth when they imagine that a "cost-benefit" doctrine of emphasis on "learning skills" is a desirable alternative to a classical, "Erasmian" approach to education. Wilhelm von Humboldt was essentially correct. The sooner we recognize the connection of that to fostering increase of scientific potentials and the improved quality of the new citizen, the quicker we shall begin to recover from the drift into New Sodom and functional illiteracy, the drift which is the root of the presently accelerating erosion of our in-depth military potentialities.