

Restore classical education to the secondary classroom

Part 1, by Lyndon H. LaRouche, Jr.

On July 26, 1985, Lyndon LaRouche addressed an open letter to Albert Shanker, president of the United Federation of Teachers, putting forward a program for reforming American education. The letter was published as an appendix in EIR's April 1986 Special Report on "The Libertarian Conspiracy to Destroy America's Schools." We publish below the first of a two-part series of excerpts from that report.

This document introduces a new series on the issue of curriculum reform. Contributions to the debate are welcome, and, if thought-provoking and moral in their outlook, will be published even if the editors do not agree with them.

Foreword

The rock upon which the best achievements of Western European Judeo-Christian civilization has been based, is a notion that the rightful political equality of individual persons before the law flows from the nature of the divine spark of potential for fruitful reason peculiar to all persons. The development of the potentialities of reason of the individual mind, and of affording to each person opportunity to employ such potentialities for good of himself and of mankind generally, is the right of each person and is also the obligation of both that person and of the institutions of society as a whole.

As early as "block-play," we may observe the spark of genius in any young child. Whenever the child, by his or her own efforts, first discovers a type of solution to some problem, the result we observe includes what we sometimes describe as "a light turning on" in that child's mind. The admiring adult recognizes the special quality of joy which the child experiences in that circumstance, and sometimes the adult is brought to the brink of tears of joy in witnessing

this. The teacher to be admired, at all levels of education, is the one who has learned to catalyze such childlike joy of learning experience among the students.

On this account, there are two general approaches to what is called education. The one approach is based on the principle we have just indicated: the student's joyful increase of the independent powers of his or her mind. The opposite approach is that of "drill and grill," in which the student is rehearsed in regurgitating approved answers, whether or not the student has any independent knowledge of the rightness or wrongness of such answers.

The second method, that of "drill and grill," is symptomized by the "multiple-choice" questionnaire sort of testing. The first method, by the student's essays of response to challenging sorts of test-propositions. The second method is suited to large classrooms and mass lecture-hall student audiences, such that test-results may be calculated economically by computers. The first method is labor-intensive, signifying small classroom populations, and more time expended by teachers in out-of-classroom than classroom activities, in the practice of their professions.

The second method relies upon the modern form of textbook, in which the purported "right answers" are arrayed. In the first method, the emphasis is upon the pupil's study of selected classical sources, bearing upon humanity's progress in elaborating that subject-matter up to the point of its most modern advancement. In the physical sciences, for example, the student should relive the act of discovery of each great discoverer, by aid of such means as guided reconstruction of famous crucial experiments. In the second method, the student learns to employ approved procedures for constructing approved kinds of answers, whether or not the student ever acquires the basis for independently proving the



The Boys' Choir of Mexico's National School of Music performs in Washington, D.C. "Music should be presented as classical poetry sung according to the principles of well-tempered polyphony."

rightness of such choice of procedures. In the first method, the emphasis is upon development of the student's powers of independent judgment, the power to prove independently which is the right and wrong method to be applied.

The modern history of the progress of education to the effect of the first choice of method, begins during the late 14th century, with Groote and the great teaching-order, the Brothers of the Common Life. Famous graduates of the secondary-education programs of the Brothers of the Common Life, including Nicolaus of Cusa and Erasmus of Rotterdam, contributed to the establishment of the principles of classical humanist education brought forth by the 15th-century Golden Renaissance. The republican colonies in North America, typified by the tradition of Winthrop and the Mathers in the Massachusetts Bay Colony, pioneered in affording a classical humanist education for the population as a whole. The fruits of these and related efforts in education, were combined and improved upon in the design for secondary education devised by Wilhelm von Humboldt. Humboldt's reforms contributed much to the advancement of education in the 19th-century United States.

During the present century, U.S. education has retrogressed, despite commendable, temporary, efforts to reverse this trend. Admittedly, during the present century to date, there was, up into the 1967-70 period, a tendency to broaden secondary and college education to include larger portions of the general population. The very real improvements in public policy of practice on this account, up to approximately 1968-70, must be distinguished from the secular decline in quality of content of education over the same period. Over the interval

1968-85, education has deteriorated in both respects: The quality is collapsing, and a declining portion of the student-age population is reached by a declining standard of education delivered. By the measures of both quantity and quality, in education, we are presently at the brink of a disaster.

Look at current trends in education with reference to dominant taxpayer attitudes of the 1950s. Both the suburbanite taxpayer of the 1950s' "baby boom," and the black civil rights activist of that period, would abhor the quantity and quality of education delivered per pupil today. However, only a tiny minority of those taxpayers, then or today, has been sympathetic to those classical-humanist ideals in education which inspired the founders of the United States. It has been the prevailing sentiment, that, beyond elementary school levels in "reading, writing, and arithmetic," the education of the adolescent and young adult ought to be delimited according to the student's prospective occupation in a profession, a trade-skill, or as housewife or public-welfare recipient.

Thus, in an hypothetical debate between a time-traveling taxpayer from the 1950s, and a defender of today's downward trends in education, we might imagine the following sort of argument. The time-traveler would register his or her horror at the present state of collapse of education. Yet, that time-traveler would be unable to resist the rebuttal: "You must understand, that in a 'post-industrial society,' the professions and trades of industrial society are vanishing; so, the kind of education we used to associate with preparation for those adult occupations has no relevance for the majority of students of today."

From the Massachusetts Bay Colony of the Winthrops

and the Mathers, through Franklin, and George Washington, education had two objectives.

Primarily, the function of education was to qualify the student as future citizen of a democratic republic, as the widely circulated and most influential writings of Tom Paine and Alexander Hamilton illustrate the conceptual level of the majority of the electorate supporting the Declaration of Independence and adoption of the 1787 federal Constitution. All shared the expressed view of Tom Paine, that the capricious sentiments of an ignorant democratic majority were as evil a form of tyranny as a monarchical autocracy. Universal public education must foster a general level of moral and political culture consistent with the functions of the electorate in a democratic republic.

The practical issue which prompted the American Revolution, was the British policy unleashed in 1763, of degrading the English colonies in North America by means of those colonial and "free trade" dogmas defended in Adam Smith's *Wealth of Nations*. Our forefathers would never have revolted against Britain, had Britain not worked to suppress the colonies' right of local self-government, and worked also to suppress the colonies' fostering of modern manufactures. Our republic's policy was summed up by Treasury Secretary Alexander Hamilton, in his December 1791 Report to the U.S. Congress, *On The Subject of Manufactures*: "increase of the productive powers of labor" through technologically progressive, capital-intensive modes of development of basic economic infrastructure, agriculture, and manufacturing. The policies of education of the Mathers, Winthrop, Franklin, George Washington, and Thomas Jefferson, illustrate their view of the interdependency of the education of youth both as future citizens of a democratic republic, and as members of a labor-force attuned to "increase of the productive powers of labor" through fostering of scientific and technological progress.

The Humboldt reforms define the issue most clearly. The practical question is, whether the function of universal public education shall end somewhere between the sixth- to eighth-grade levels, or whether humanist education of the future citizen shall be universal through the level of Humboldt's gymnasium, approximately our twelfth-grade level. Admittedly, the heritage of the anti-republican 1815 Treaty of Vienna and the Carlsbad decrees, prevented Humboldt's educational reforms from being applied as universally in Germany as his policy proposed; also, it must be noted, the content of German gymnasium education deteriorated during the late-19th and the present centuries. The defects in application of the Humboldt reforms are not defects in the proposal itself.

In short, every future citizen has the right to a universal classical-humanist education in arts and science through the twelfth-grade level. Except for remedial programs, there should be no "tracking." The education and standards of professional qualification of teachers, as well as composition of the classroom, must be attuned to delivering this

quality of education.

In practice, such urgent reforms could not be implemented except as a series of successive approximations. The budgets, the physical classroom facilities, the roster of available teachers, and so forth, are limitations which cannot be perfectly surmounted all at once. The rate at which progress can be effected will vary, from location to location, according to attitudes of the local electorate and local authorities. The function of a proposed reform is not to establish perfection at one blow, but is to provide a sense of direction to policy-shaping, and to provide us a yardstick for measuring how far short of the needed result each otherwise commendable approximation has fallen.

The result toward which we must aim, is primarily the development of the independent powers of reason of the young adult in the child and adolescent. A classical-humanist education in the arts and sciences, guided by the first method indicated above, is necessary to produce the qualified citizen of a democratic republic; that is our primary goal. There is no conflict between this requirement and the requirements of employment. Obviously, classical pre-scientific education in secondary schools must be attuned to the emerging frontiers of science and technology. The graduate of the secondary school, so qualified, has the best qualification for entry into specialist education at the college level.

The proper design of public education in general, starts with the tasks of secondary education. Elementary education is then derived as preparation for entry into secondary programs.

College-level education, is then based on the outcome of secondary education as its starting-point and foundation.

For example, in primary schools, it is not necessary that children spend several years drawing ugly blotches, in which blotches both parents and teachers must discern "artistic talent" by some mysterious agency. Albertian perspective can be introduced to the educational play of young children, thus affording the child a means for discriminating "rightness" from "wrongness" in drawing. Later, on the secondary level, the student can be introduced to Leonardo da Vinci's correction of Albertian perspective: projections of convex hemispherical mirrors, and know of his or her own independent judgment, why Leonardo's perspective corrects an error inherent in Albertian perspective.

The benchmark objective of secondary education should be the fostering of future leading scientific discoverers. The essence of scientific progress, is the discovery of some axiomatic fallacy permeating some aspect of presently accepted scientific opinion. The essential requirements for such discoveries, are clearly two. First, scientific discovery demands developed powers of independent judgment, and confidence in those powers. Second, those powers must be competent; the power of independent judgment must be made rigorous, especially with respect to comprehension of axiomatics. In scientific work, this power is obtained best through the stu-

dent's working through the internal history of science, especially from the work of the 15th and 16th centuries, through the elaboration of the theory of functions at Gauss's Göttingen during the 19th century.

If this development of future scientific discoverers is the adopted benchmark of educational policy, the conduct of education will be the best for all students. Education will then be the nurture of those potentialities which the child exhibits in the joyful experience of "a light turning on" in his or her head. The capacity for that beautiful experience must never be suppressed or dulled by methods of "drill and grill" textbook-education, at any level of the process. By nurturing that beautiful potentiality, arming it with rigor, the fullest potentialities of the student must be brought forth by completion of the twelfth-grade level of universal education.

I have divided this report into three topical sections: 1) the economics of public education; 2) the topical composition of public education; and 3) the methods of education. . . .

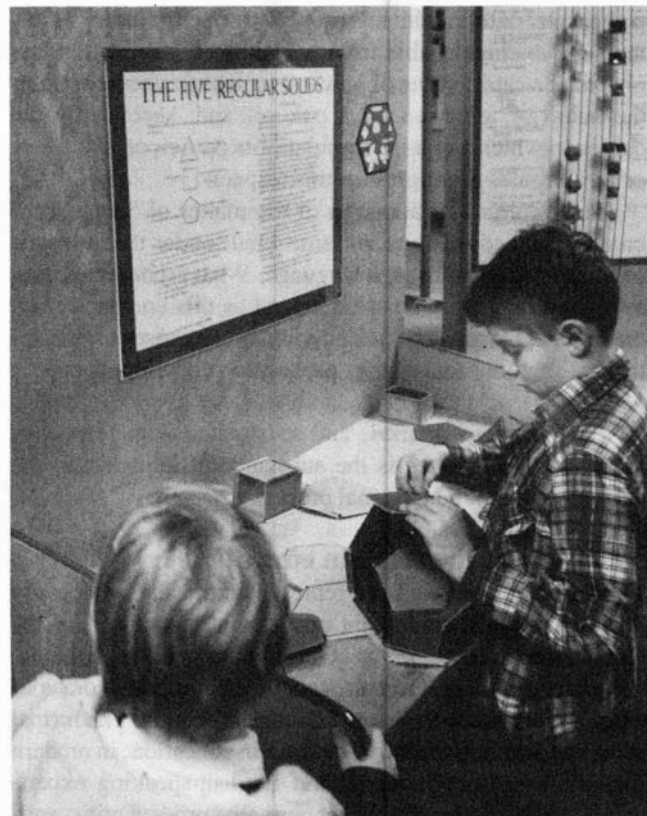
Topical composition of public education

In his socratic dialogues, Plato insists repeatedly, every proposition stated verbally in terms of what he terms "my dialectical method," incorporates a principle which can be restated better in the language of geometry. From a modern standpoint, the characteristics of Plato's arguments in matters of geometry, show beyond doubt that Plato's notion of geometry was not the aristotelian, axiomatic-deductive schema, we associate with Euclid's *Elements*. Plato's geometry was of the general form modern practice associates with a "synthetic" or "constructive" geometry, in which only circular action is self-evidently elementary, and all other forms, including the straight line and point, are derived by constructions based upon circular action. The point is made most forcefully, by reference to the treatment of the "Five Platonic Solids," in Plato's *Timaeus*.

In that sense, all human knowledge can be defined as a matter of language. Analytically, today, this view of language may begin with study of the physiology of the processes of perception. Instead of accepting naive sense-certainty, physics' evidence obliges us to recognize that our perceptual images are topological encodings of experience. Thus, even thought itself is a language. Just as there must be a correspondence between experience and the language of thought, so there must be a correspondence between the language of thought and the language of communication among persons.

To this purpose, we must signify "human language," as something characteristically different than mental experience and communications among beasts.

If mankind were merely another beast, the human population could not have exceeded that of the crudest form of



A child constructs a dodecahedron. "The dodecahedron is the topological characteristic of projections of conic self-similar spiral action into Euclidean space, just as this same projection determines the solar elliptic orbits of Kepler's laws." Its 12 sides also correspond to the 12 steps of the well-tempered scale.

so-called "hunting-and-gathering society," a maximum of approximately 10 million individuals. The distinction of mankind on this account, is the characteristic feature of human behavior which accounts for the growth of population to nearly 5 billion today. Unlike the beasts, who cannot alter the range of their behavior beyond limits, except by human intervention, mankind is able to alter its behavior willfully, to the effect of increasing the per-capita power of mankind over nature, to increase the average number of individuals which can be sustained on a square kilometer of land.

Mankind accomplishes such increase of the per-capita value of potential relative population-density, by effecting changes in human behavior which are consistent with increased knowledge of the lawful ordering of our universe. These are changes in man's relationship to nature, and are also man's changes in the organization of nature. It is this potential, to be self-governed by scientific reason, to the effect of increasing mankind's per-capita power over nature, which pertains to that rightly termed the "divine potential" in each newborn human individual.

It is the transmission and further improvements of the cumulative knowledge bearing upon this increase in man's

power over nature, which is properly termed “culture.” Cultures are distinguishable from one another, first, by the degree of per-capita value of power over nature associated with the behavior informed by a culture, and, second, by the degree to which a culture stimulates its participants to lesser or greater rates of progress in this respect.

This returns our attention to the matter of “language,” broadly defined. Culture is transmitted, under the guidance of communication through language. What is communicated as uttered language, must be judged as this compares with the internal language of the individuals’ processes of perception of nature, and those processes’ correspondence to nature.

Language, so defined, and so situated with respect to nature and to culture, is the substance of knowledge, the subject-matter of educational processes.

The roots of the crisis in education

The standpoint we have represented thus far, is describable either as the standpoint of classical humanism, of the Golden Renaissance, or, as at least not inconsistent with the current of classical humanism running through Nicolaus of Cusa, Leonardo da Vinci, and Gottfried Leibniz. The formal source of all fundamental issues within education, in modern Italian-, French-, German-, and English-speaking experience, is the emergence of a nominally pro-scientific anti-Renaissance current, emerging within science and philosophy approximately the beginning of the 17th century. This anti-Renaissance current defined itself during the 18th century, as the organized effort to extirpate the influence of Leibniz: Voltaire, Rousseau, and the “materialist Enlightenment” in France, David Hume and his associates in Britain, and Immanuel Kant in Germany. For brevity, it is sufficient to identify the leading element of Humean anti-rationalism in the work of Kant, most notably Kant’s irrationalist positions on the subjects of creativity generally and aesthetics.

Until Immanuel Kant perceived David Hume to have departed from Hume’s own, earlier emphasis upon respect for traditional customs, Kant was the leading exponent of Hume’s philosophy in Germany. On this account, Kant was notable within Germany as an ally of the tradition of Wolffian banality, the leading anti-Leibniz current within German academic life. In logic and dialectics, Kant was a neo-aristotelian formalist, who accepted Hume’s radically empiricist definitions of human nature and human understanding, while attempting to explain the force of custom in human behavior from a formal-logic standpoint. This latter attempt is summarized in Kant’s *Critique of Practical Reason*.

Kant broke with Hume only when Hume began to bend in directions later amplified by Jeremy Bentham and “19th-century British philosophical radicalism.” Hume began to open the doors of 18th-century British empiricism, philosophically, to a radical hedonism echoing that of Thomas Hobbes. Kant resolved to defend the rationality

of adherence to custom.

The issue of Kant’s own irrationalism was brought into public review by Friedrich Schiller during the 1790s, starting with Schiller’s attack on Kant’s treatment of creativity and aesthetics, in Kant’s *Critique of Judgment*. The influence of Schiller’s rebuttal of Kant on this matter, shaped the thinking of such students and admirers of Schiller as Beethoven, Wilhelm von Humboldt, Herbart, and numerous others.

Kant insisted that there is no rational basis for creativity, and no rational basis for a theory of aesthetics in art. A more radical version of Kant’s irrationalist doctrine was introduced to state policy in post-1815 Germany, by Berlin Professor of Law Friedrich Karl Savigny. Savigny’s evil doctrine, of hermetic separation of *Geisteswissenschaft* (e.g., “liberal arts” and law) from *Naturwissenschaft* (e.g., natural science), has been singularly influential in English- and Spanish-speaking countries, as well as in establishing his doctrine in Germany.

It is relevant to this matter of educational policy, to stress the fact, that Savigny is the philosophical father of Nazi legal doctrine, the irrationalist *Volksgeist* doctrine, in which views attributed to current trends in “popular opinion” displaced all contrary principles of constitutional and natural law, respecting the rights of the individual. On the one side, Savigny defended the restoration of the precedent of Roman imperial law. Within that framework, he insisted that there existed no higher principle of moral law than the continually shifting body of contemporary opinion of a people, the *Volksgeist* principle becoming the *völkische* principle of Nazi law.

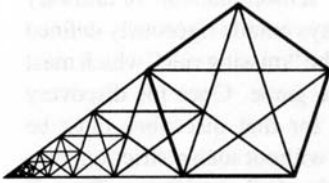
It is from this standpoint of reference in law, that the evil of Kant and Savigny’s doctrines of aesthetics is best understood: “Taste” is a matter of arbitrary preferences, preferences subject to no provable principle: “Taste is indisputable.” Similarly, creativity is arbitrary and mysterious, such that it cannot be taught in any rational manner.

Respecting the plastic arts, for example, the Athens Acropolis was designed in all major features according to a consistent geometrical principle; the harmonic division of the circle in consistency with those harmonic proportions peculiar to living forms, especially the human form.

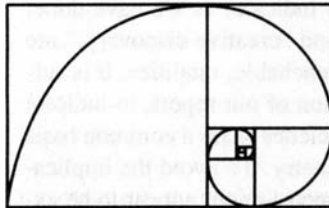
The significance of this, was rigorously examined by the circles of the collaborators Luca Pacioli and Leonardo da Vinci, beginning in the 1580s, at Milan: e.g., Pacioli’s *De Divine Proportione*. They showed that all living processes were characterized in growth and determined morphology of bodily function, by harmonic proportionings congruent with the Golden Section. Today, between the extremes of astrophysical and microphysical scale, every process which is harmonically congruent with the Golden Section, is either a living process or an artefact produced by a living process. The revolution in perspective, and revolution in principles of composition of the plastic art-forms, by da Vinci, by Dürer, and by the School of Raphael, is based entirely upon this revolutionary discovery of the geometrical principle of beauty.

FIGURE 1

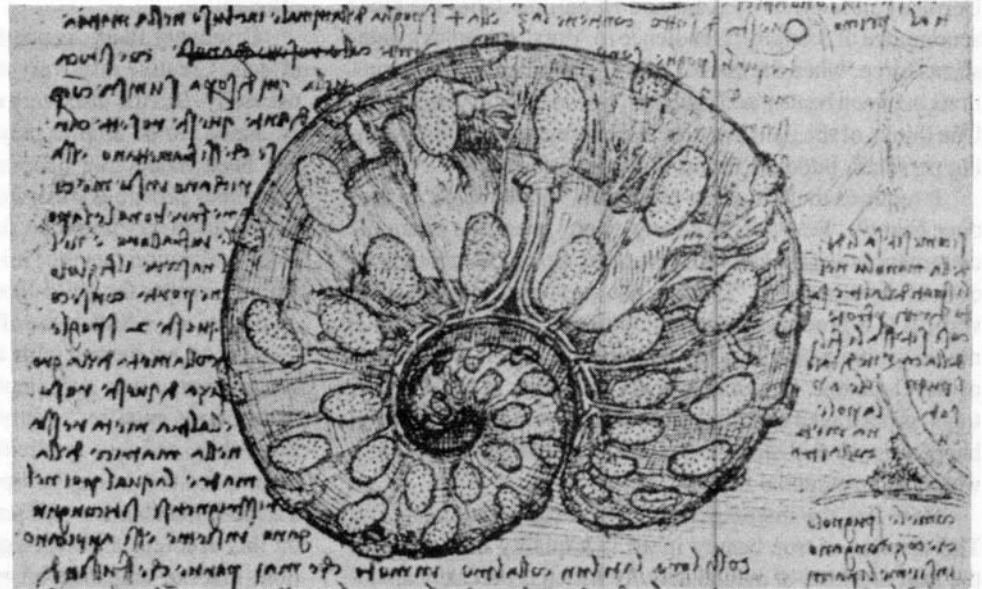
The Golden Section



(a)



(b)



(c)

The Golden Section divides a line into two segments, such that the ratio of the two is proportional to the ratio of the whole length to the larger of the segments. This is also expressed as the relationship between the diagonal and the edge of a pentagon, as shown in (a). A rectangle constructed using these lengths is known as a golden rectangle, and can be divided into an infinite series of golden rectangles, as shown in (b). The logarithmic spiral thus created is characteristic of growth patterns of living things, as Leonardo da Vinci's drawing of a cow's uterus illustrates (c).

The same is true of music. The modern well-tempered octave-scale, was established by al-Farrabi by the close of the 10th century, whence it came to Europe. Al-Farrabi stresses, that well-tempered scales were already very ancient at the time he devised the octave-scale. "Well-tempered polyphony" existed by the time of Plato. Yehudi Menuhin has reported a set of equal-tempered bells, dating from about 1000 B.C., in China. Ptolemaic tuning was a wrongful extravagance, reintroduced to Europe during the 16th century by the counter-Reformation, after the circles of Leonardo had already established the scientific basis for the well-tempered tuning. Through the influence of Leibniz on this subject, J.S. Bach perfected well-tempered polyphony, whence classical polyphony through Mozart, Beethoven, Schubert, Schumann, Verdi, Brahms, et al.

The Golden Section is the common root of beauty in both the plastic arts and music. The Golden Section is, of course, the metrical characteristic of projections of conic self-similar-spiral action, and also the Plato-Euler limit which defines the bounds of commensurable constructability in Euclidean space. By virtue of the work of Euler, we know that the dodecahedron is the topological characteristic of projections of conic self-similar-spiral action into Euclidean space, just as this same projection determines the solar elliptic orbits of

Kepler's laws. Hence, if we treat the spiral projected, by conic self-similar-spiral action, as a monochord, and divide the circle containing this projected spiral into 12 equal sectors, the ratios of the values of the monochord's segments correspond precisely to the well-tempered octave-scale.

Like the Ptolemaic tuning, Helmholtz's doctrine of acoustics and "natural intervals," is simply an absurdity. The physiology of singing and hearing, as well as simple geometrical construction of equal-tempering, show the well-tempered scale to be the only "natural scale," with each and all of Helmholtz's observations on the subsumed matters exposed to date as absurd.

There is a most significant element of disagreement, between classical Greek art and great Renaissance art. The latter is truly Augustinian, defending and celebrating that conception of the individual human personality subsumed by the doctrine of *Filioque*. Classical Greek beauty one admires; classical Renaissance beauty is inspiring. Differences noted, the essential principle of beauty is the same in both, a principle qualitatively more advanced in expression in such works as those of Leonardo and Raphael. The principle of beauty is that harmony which is congruent with the principle of life. Great art surpasses this minimal requirement, to celebrate the spark of divinity in the human individuality.

How right was Heinrich Heine, in his *Religion and Philosophy in Germany*, to warn that if horrors erupted from a future Germany, they would surely erupt from the side of Germany influenced by Kant and Hegel, the latter the close accomplice of Savigny. Obedience to "duty" becomes a monstrous force, when the idea of "duty" is blinded to the distinctions between beauty and ugliness, between right and wrong. One thinks of the paid assassin addressing his victim: "Nothing personal, buddy; I'm just doing my job."

It requires more than the proverbial "pretty face," to produce beauty: "Beauty is as beauty does." In art, the harmonic congruences which are indispensable, are the form of a process of development. "Life" is not a noun; it is a transitive verb, it is a process of continuing transformation. Music is not an arbitrary progression of sweet sounds; it is a process of development. A painting is not beautiful, if what it portrays, is portrayed as still; it must capture something beautiful happening, in mid-stream; it is the "happening" so captured, which is the essential beauty.

Here lies the interdependency of beauty and creativity. The essence of true beauty in art is a quality of discovery, the fruit of a kind of mental activity which is precisely analogous to scientific discovery. A finished work of art cannot be a direct reflection of the act of discovery; the initial act of discovery, although beautified by the child-like joy of discovery, is inherently a disorderly experience. The experience leads the discoverer to the design of a work of art, and, more probably, an entire series of productions, each elaborating that discovered principle in a different setting, usually attempting to employ the principle with greater effectiveness than earlier.

In mathematics, we can define the meaning of creative discovery rather neatly. One of the central problems treated by Gauss and his circle, is the axiomatic incapacity of Fourier Analysis to define continuous processes which subsume, more or less densely, formal mathematical discontinuities. The Weierstrass discontinuity is the classic statement of the problem. This is the problem which was solved in principle, by Lejeune Dirichlet, to the effect that the work of Dirichlet and Weierstrass was combined in Riemann's elaboration of the principle of the Riemann Surface. In this setting, "creative discovery" has a precise physical meaning.

Whenever a true physical singularity is generated in a process, an added degree of freedom is invoked, such that, accordingly, the affected phase-space undergoes a change in its metrical characteristic of action. This standpoint guides us to a way of appraising true scientific discovery. A true scientific discovery cannot be fully appreciated, until we examine its implications for practice, until we examine the way it causes human behavior to be altered by possession of that knowledge. In economic science, this appears in the guise of new qualities of materials and instruments, the changes in economies underlying the non-linear characteristics of economic processes. The term, "discovery," applied

to art-forms, ought to be restricted to the same sense. No great artist is diminished in reputation by doing so, although the triviality of many may-fly reputations is shown more efficiently.

Discovery in art, is not the "sensationalism" of arbitrary effects. Creative discovery always entails rigorously defined necessity. It is the discovery of the "missing rule" which must be added, to be able to play the game. Once the discovery has been made, the necessity for that discovery must be rigorously provable; otherwise, without such restriction, purported discovery might be simply another arbitrary effect. It is the realization that the "missing rule" has been discovered, which prompts the child-like joy of artist and audience, that quality of joy which is the affective aspect of beauty.

We go no further with that sub-topic's development at this moment. It is sufficient to indicate, as we have done, that notions such as "beauty" and "creative discovery," are knowable, and thus implicitly teachable, qualities. It is sufficient, for this immediate portion of our report, to indicate that both the classical arts and science share a common basis on this account, a basis in geometry. To avoid the implication, that our emphasis on geometry might appear to be extravagant, it is most useful, that we reference discussion again to the subject of the physiology of perception. The physiology of vision shows us the principled manner in which the brain works, to the effect that the crucial implications of the physiology of vision apply generally.

At first inspection of the manner in which the brain organizes and interprets optical sensations, it appears that the brain is a marvelous instrument for reducing projected images of the complex domain of physical space-time, into the form of objects in Euclidean space. This interest is heightened, by observing the manner in which the brain treats those forms which are not constructably commensurable with Euclidean space. The internal history of modern mathematical physics, emphatically the current leading from Cusa, through Leibniz, through Gauss, confirms Plato's insistence, that the world of sense-certainty is not the real world, and shows that the mind is able to adduce the real world, nonetheless, by treating the perceptual images in the mind as reliable sorts of topological encodings consistent with the principle of projective invariance.

So, the line of developments in synthetic geometry, leading from Plato and Archimedes, through Cusa, Leonardo, Leibniz, Euler, Monge, and Gauss, shows itself to provide us the most general sort of knowledge, pertaining to each and all subject-matters of art and science.

Taking art and science, so defined, as a unified whole, they represent, as one whole, human culture. The essential quality of culture is not that aspect of its subject-matters which might be viewed as finished products, but culture up to this point as the culmination of an uncompleted process of onward development. At best, we transmit culture to our progeny, and they amend it, contributing their portion to the

endless process of perfection. It is, therefore, that developmental aspect of culture, and of each subject-matter of culture, which is the essential part.

In physical science, the crucial thing is the internal history of science. The student must see science, not as a fixed set of recipes, but as a process of successive scientific discoveries, each one overthrowing the authority of at least some of its predecessors, and yet also depending upon the preceding discoveries as the foundation for accomplishing the change. The student, by reliving selected cases of original such discoveries, is induced to associate the word, "science," less with a fixed body of recipes, and more with a process of discovery, with the issue of methods of discovery.

This is the case for all subject-matters of the classical arts and science.

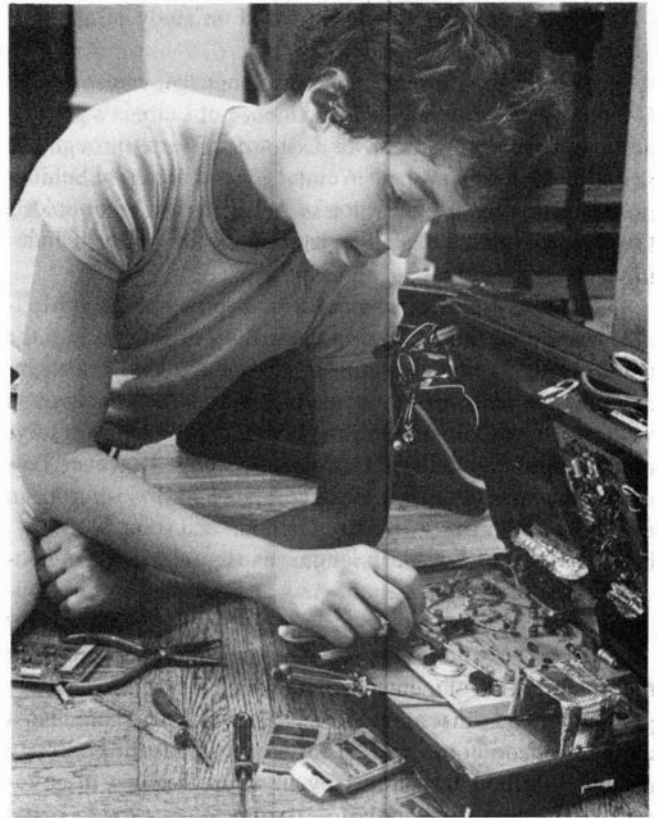
The three languages of culture

All teaching is properly subsumed under three general classifications of language: 1) the language of vision; 2) the language of hearing; and 3) the language of well-tempered polyphony, which is, analytically, the point of overlap of the other two.

The *language of vision*, is founded upon synthetic geometry as such, and leads into both mathematical physics and the plastic arts.

The study of the *language of hearing*, is properly based today on classical Indo-European philology as the benchmark, from which vantage-point to study language in general. The teaching of language as such, should correlate with teaching of synthetic geometry. In place of formal instruction in the rules of grammar, the students should confront the problem of communicating real and hypothetical occurrences. A sense of physical space-time: For example, a child is reporting where he is standing today, the content of a report which he heard in a different place yesterday; the report he heard alleged that an event had occurred in a different place, a day earlier. In such a fashion, the various tenses and moods are made simple requirements for accurate reporting, each and all subject to the student's independent ability to judge rightness and wrongness, rather than being learned as arbitrary rules.

On this account, the teaching of classical Greek, from Homer through Plato, and some supplementary teaching of the rudiments of classical Sanskrit, ought to be a benchmark in the language-programs of secondary education in Europe and the Americas. Classical Sanskrit, including the Vedic literature, is the most advanced language in the world today, by standards of philology; it is also the oldest form of surviving literate forms of language, and the key to study of the Indo-European languages generally. It is not proposed, that full mastery of Sanskrit be taught on the secondary level, of course; rather, the principles of Sanskrit should be taught as an indispensably included feature of comprehension of the general principles of the Indo-European language-group.



"The student must see science, not as a fixed set of recipes, but as a process of successive scientific discoveries, each one overthrowing the authority of at least some of its predecessors, and yet also depending upon the preceding discoveries as the foundation for accomplishing the change."

Closest to Sanskrit, in terms of implicit conceptual power, is the form of classical Greek associated with Plato's writings. Additionally, classical Greek literature, from Homer, through Aeschylus and Plato, is the benchmark for tracing the internal history of European culture as a whole. The conceptions with which these classical writers wrestled, are the leading problems of conception referenced and treated by leaders of European culture, into the early 19th century.

Ranking next in power, among European languages, is the classical Italian of Dante, Petrarch, and the 15th- and early 16th-century Golden Renaissance writers. All of the Romance languages are, predominantly derivatives of Italian (not Latin); from the 14th through 16th century, the reshaping of English into the literate language of Shakespeare and Milton, was guided chiefly by reference to the Italian model. Spanish today, is recognizably a dialect of Italian, as Portuguese is, predominantly, recognizably a variation of the Genoese dialect. Into the 19th century, the variety of French spoken by the majority of French people was an Italian dialect, with the spread of Parisian French restricted to a minority around the royal court in the 17th century, and not hegemonic until the recent hundred years. Hence, the study of

Romance languages should be based on study of classical Italian.

New High German is a synthetic language, whose literate form today owes much to the influence of Leibniz's proposals, and the continuation of Leibniz's efforts through the circles of Lessing into the Weimar Classic period of Schiller et al. Through the influence of Wilhelm von Humboldt's circles, *Germanistik* studies have a special place in Indo-European philology.

Medieval Latin, otherwise better described as Church Latin, has an important place in the history of Europe into the 17th century, including the history of science. Until the beginning of the 18th century, most of the important writings in science are either in Latin, or, beginning the 17th century, increasing use of Italian, French, and German. However, Latin is otherwise of much lesser importance for Indo-European philology than Greek, Italian, German, and some Sanskrit.

Speakers of European languages should undertake non-Indo-European languages of Asia and Africa from the vantage-point of a grounding in Indo-European philology. By the end of the century, the population of China will probably be about 1.2 billion, the Subcontinent of Asia approximately the same, and the remainder of the Asiatic Rim more than a half-billion: totaling nearly 3 billion. Although the philology of the non-Indo-European language-groups ought to be reserved for specialist studies on the university level, initial familiarity with one or more of these languages on the secondary level has practical importance for our society's future, and the foundations of later familiarity are best established by aid of comparative philology.

It should not be overlooked, that fluency in a foreign language is best grounded during elementary-school age-levels. Exchange-programs, under whose terms U.S. pupils spend a school-year in a foreign school-system, would be most valuable.

In summary, classical Greek, Italian, and German, with some grounding in Sanskrit, should be the core program in philology in secondary schools, with a menu of choices for study of other languages offered in the "modern languages" subsidiary of the Department of Indo-European Philology.

Literature

The literature included in the curriculum of the Department of Indo-European Philology, should be truly a program of reading of the classics, omitting what are often included as "modern classics," especially omitting so-called "modern classics" of fiction and poetry of the recent hundred years.

English classics center upon Shakespeare, Milton, Jonathan Swift, Keats, and Shelley, and include American 17th-through early 19th-centuries' English-language classics. The latter include writings of the Mathers, of Winthrop, of Benjamin Franklin, Tom Paine, *The Federalist Papers*, selections from the speeches and correspondence of Washington, Jefferson, John Quincy Adams, Mathew Carey, and Abraham

Lincoln, and of Washington Irving, James Fenimore Cooper, and Edgar Allan Poe.

Foreign-language classics include Homer, Aeschylus, Plato, et al.; the Latin or translations of key passages of St. Augustine, Alcuin, Abelard, Nicolaus of Cusa, and the Ecumenical Protocol of the 1439-40 Council of Florence; the Italian of Dante and Petrarch; the writings of the classical humanists, such as the Erasmians, into the early 19th century.

The term, "classics," ought to be reserved to exemplary writings of the current of classical humanism, running through the Golden Renaissance and the trans-Atlantic conspiratorial circles of Benjamin Franklin. Acquaintance with the writings of the adversaries of classical humanism, such as the "materialist Enlightenment" of 17th and 18th century France and England, should be reserved essentially to the curricula of the Department of History. Readings in classical humanist science, and of its adversaries, should be reserved essentially to the Department of Science. Literature programs under the Department of Philology, should be selected to uplift the efficiency and breadth of the moral development of the students: to increase the power and depth of the student's power to formulate conceptions from a rigorous classical-humanist standpoint, and to comprehend conceptions so formulated.

The Department of Music

Music should be presented as classical poetry sung according to principles of well-tempered polyphony.

The basis for this is best established on the primary-school level, by development of children's choruses based upon 1) the bel canto method of singing, and 2) strict adherence to a well-tempered scale set at middle-C=256, as Bach and Mozart tuned their instruments to a C=256 benchmark for a well-tempered octave-scale.

Girl students' ability to continue singing is essentially unaffected by pubertal voice-change; whereas boys should cease singing during that transition. Some specializations in musical instruments should be established prior to that age-level, and orchestral training should supersede singing until later adolescence.

Already, on the elementary level, musical education of choruses should proceed through simple well-tempered canonical polyphony to the most elementary features of counterpoint. The pupil who has acquired a sense of "absolute pitch" values for the C=256-pivoted well-tempered octave-scale, has the foundations to learning music as a language is learned by children. Such children learn readily the complementarity of the upward and downward intervals of fifth, fourth, and of major and minor thirds, as well as the pivotal significance of the C-F-sharp interval. Thus, the complementarities based on the intervals of fourth and fifth, as set against intervals of the fifth and sixth, are readily assimilated with practice.

The program in counterpoint, continuing into the secondary schools, should be referenced to the famous problem first solved by J.S. Bach in his *Musical Offering*. This is the problem treated afresh in Mozart's famous *Fantasy-Sonata*, and in several C-minor-key compositions of Beethoven, and of others. The point is to afford the student a mastery of the most elementary of all developmental progressions in music, the transition from major to minor keys.

Simpler compositions of Bach and Mozart are to be prized. The objectives include: 1) to afford the student an intimate sense of the connection between the poetical and musical strophic form of composition; and 2) to show, in the simplest way, how the implicit voices lying across the parallel singing (or instrumental) voices, are key to musical development. The student must recognize the way in which the metrical characteristics of classical poetic composition spill over to dominate musical composition, and how polyphony adds dimensions to poetry not possible for poetic lines "sung in a single voice."

The secondary programs in musical education, must concentrate upon correlating the teaching of principles with the practice of perfecting performance of a composition through intensive rehearsals. The mastery of simple and beautiful compositions, such as the Mozart *Ave Verum*, well within the scope of competent delivery by typical secondary-school pupils, ought to be part of the graduating qualification in music on the secondary level. The object is to provide a sound grounding for the musical potentials of the students, variously, as future performers, or merely as that sort of competent audience which includes impromptu amateur musical activities as part of the joys of daily life.

The hereditary relationship of music to the singing of poetry, as in the classical Greek or Vedic, places music thus in the domain of the language of hearing. The harmonic principles of polyphony and polyphonic development, locate music within the language of vision: geometry. This duality affords well-tempered polyphony a special place among the cultural achievements of mankind. In this medium, mankind celebrates the essential features of all of our potentialities.

Such proposals for musical education, run afoul of current prejudices. Kant and Savigny's doctrine, that the arts are a matter of popular taste, has gained sway among populations which would otherwise abhor identification with philosophical fascism. Thus, it is overlooked, in one class of cases, that not only was Richard Wagner a philosophical fascist by personal profession, but that his music, like that of Berlioz and Liszt, is also philosophically fascist. In another class of cases, the fact that the dionysiac imbecility of "rock" is immensely popular, is adopted as premise for including instruction in "rock" in secondary curricula, it being said that this is necessary to make musical instruction "relevant to pupils."

As Bach's *Musical Offering* illustrates the point most simply, musical creativity centers upon the discovery and

elaboration of a provable sort of new rule, a rule whose discovery enables one to play the game. Whereas, in Liszt and Wagner, among others, arbitrary chromatic sequences are employed to produce arbitrarily concocted sensual effects, presaging the principle of Hitler's Nuremberg rallies, as well as echoing the philosophically fascist, cult-centered productions of Claudio Monteverdi. In musical discovery, as in valid scientific discovery, the human mind tolerates no "discovery" which does not enable us to master the lawful ordering of the universe in some useful way. So doing, we alter what we adduce as the laws of the universe, but we are able to prove that this addition, this change, is a more comprehensive, more valid, less imperfect, comprehension of a universe which remains essentially a lawfully ordered one.

In music, this principle of discovery is located in the developmental features of the composition. It is the successful elaboration of this principle which evokes the proper emotion of musical experience, the childlike joy of rational discovery.

Philosophical fascism, like the irrationalism of Kant and Savigny, is sacrilegious anarchism by profession. Those who set themselves up to be the gods of Olympus, assert the privilege of ruling capriciously over men and nature, and pride themselves in defiance of any higher body of natural law contrary to their own capricious impulses. They pride themselves upon the power to exert their arbitrary will over man and nature, and derive their greatest hedonistic excitement from so doing.

On the one side, such philosophical fascists, like Thomas Hobbes, or Bentham and the "19th-century British philosophical radicals," degrade man into an individualistic, hedonistic beast, "of each in war against all." Otherwise, they degrade mankind into the bestial, egoistical particularisms of "race," "religious sects," and so forth. At the one extreme, we have the debased "Dorian Greys"; at the other extreme, we have the deranged "race" or "religious sect," asserting the right to impose its arbitrary will upon those of other races or sects. Wagner and dionysiac "rock," are paradigms of such philosophical fascism invading the domain of music.

If a deranged obsession with populism, seems to compel us to submit to the mere appearance of popular tastes, in defiance of "right" and "wrong," of "beauty" versus "ugliness," then that trait in our national character which so instructs us, marks us, like Biblical Sodom and Gomorrah, as a people self-doomed to destruction.

If we do not wish to contribute to the self-destruction of our republic, of civilization, our "tastes" must be checked by reason. There is, in any case, no need to teach the principles of a subject-matter which, by definition, rejects all principle. Such debased arts can be so easily learned in the streets and houses of prostitution, that it were, at best, superfluous, to burden the tax-rolls with teaching such degeneracies in the schools.