mentalism drew education, scientists are now leading the way. In recent years the brilliance of experimental method has been outshone by the even more dazzling qualities of theoretical physics. The pertinent fact for our purposes is the limitation which these theoreticians themselves have laid upon the scope of the valid conclusions to be drawn from the labors of scientists. The physicists seem to take all science for their province, and again justify the old name of "natural philosophy" by which physics had long been known; but they have underlined the word "natural," and surrendered to metaphysics the world of meanings and values whose outworks and redoubts had been captured in their rush forward into the unknown.

Moreover, the educational psychologists themselves, alarmed by the irrational conclusions to which they had been brought, rechecked their experiments, rediscovered the transfer of training, cast doubt upon the fixity of intelligence, realized that the conditioned reflex had only relatively narrow ranges of validity, and came to see that philosophy must have its field of action as well as science.

Economic and political factors also contributed to the restoration of faith in genuine education. Financial collapse around the world was prevented neither by a trained bureaucracy nor by business informed by mountains of statistics and technical instrumentalities. Twenty years of pursuing the ideal of training for citizenship was capped by the "discovery" that there was no correlation between acquisition of data on civic matters and the growth of civic spirit. Highly trained persons failed of employment in their specialities and showed so little adaptability that the absurd word "reeducation" began to be applied to the effort to reorient their economic energies. There arose in quarters which for years had mocked the idea of a "liberal" education a loud cry for "general" education—something of universal validity and available to all people, whatever their walk of life or vocational activity. The whole concept of training as an adequate preparation for life in a world of scientific and political flux fell into disrepute and opened the way to reform.

Finally, in this connection, attention was paid to the voices, which had never been stilled, asserting that many of the aspects of change were superficial because many human problems were so fundamental that neither science, with its revolutions in thought, nor the state, with its revolutionary transformations, affected them. Greed, pride, lust, love of power, stupidity, arrogance, want of will—all these survived the invention of electric refrigerators and totalitarian bureaucracy. Neither data nor techniques nor training had altered the basic characteristics of human behavior. Neither science, as such, nor the state had brought either freedom or happiness. The growth of character, the broadening of the mind, the sensitizing of emotional responses, and the emergence of spiritual values evidently rested upon bases which were beyond the reach of mere experimentalism, or training founded upon it.
It seems fair to say, therefore, that this central issue, the validity of the idea of education itself, has been clarified, and some consensus is now possible. Training, techniques, and all the skills associated with them remain; they are important, but their inadequacy as a definition or validation of the educational process is perfectly apparent. That is a great achievement in clarification, but it must be said that it offers no "solution" of the educational problem. Indeed, no human problem of these proportions is ever solved like a mathematical problem; it simply assumes new forms. There is no hope for a neat, compact formula as a substitute for thought.

Nevertheless, once the seemingly impregnable walls built by pseudo-science were breached, reform rushed in, sometimes pell-mell and with an air as unreal as that of those who attempted to supplant education by training. Schemes that were patently nostalgic were widely acclaimed; plans that sought largely to neglect the advances in scientific thinking were promoted in the name of authentic education. The substance and details of these enterprises, often fantastic, are not significant. The important fact is that they symbolize a return to a view that regards philosophy as a valid intellectual discipline, that sees the possibility of unity and coherence in knowledge and thought—a return toward education rather than training as an ideal.

But this fresh opportunity to develop programs of genuine education will be impaired if we forget that the "old" education would never have succumbed so easily to the program of training if it had not lacked vitality. Therefore, though the ideal of education is restored to us, its implementation must take account of much that has transpired. Simplified and compactly organized demonstrations, now currently displayed in the educational market, tend to evade that issue rather than meet it. Nor does the adoption of a slogan, such as "general education," do anything whatever to insure it. It may help create a public demand which will facilitate it, but the demand may go unsatisfied. Thus far, indeed, it has done so. The process of education still remains tied to mechanisms which have no essential relation to its purpose, and its outlook is still too often blocked by the vast amount of data which has been collected. Even in teaching science, data tend to take the place of discipline—but information is no substitute for reason.

The second major preoccupation of education in recent years has been with procedures. They, like the emphasis upon training, were developed in an attempt to imitate science. The highest praise which could be accorded any procedure was to call it "scientific," and in educational institutions every effort was made to ape the procedures of science. Some were borrowed directly from the laboratory, others came by way of business which, exploiting the discoveries of science, turned not only to technology but also to scientific management, so-called.
EDUCATION: PROBLEMS IN HIGHER EDUCATION

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One of the characteristics of scientific management is the development of standardized, interchangeable parts. The educational administrator, forever fitting square pegs into round holes, looked longingly at this simplified procedure. One problem in particular called for some simple, uniform solution. Secondary education was local; higher education often involved leaving home; universities and colleges were put to it to discover the undiscoverable—some patent formula which would tell when a student was ready for the transition from one environment to the other. "Units" furnished the apparent answer, and characteristically they were called "Carnegie units," getting their name at second hand from a great steel manufacturer. From that beginning the idea spread until units and credits became the universal counters of higher education.

Looking back at this development across the years, it seems incredible that anyone would suppose that the number of times a boy sat in a chair would be any indication of what entered his head. His capacities, tastes, industry; the quality of the books he read and their number; the knowledge, art, and inspirational power of his teacher—all these were obviously more significant, but all became subsidiary to "credit hours." The adding machine became more important than judgment and skill, and its deficiencies were for a time concealed by a form of self-selection of those who were to receive higher education. Statistical procedures, having taken hold at one point, spread to others until "cuts," grades, promotions, and graduation itself depended upon them. Whereas faculties used to meet and discuss whether young gentlemen were ready for their degrees, the practice arose of having the registrar sum up totals, and on the turn of a digit diplomas were granted or withheld. The effort at collective judgment was abandoned as being "subjective," therefore not scientific, whereas all the deficiencies of numbers as representatives of knowledge and power were overlooked because they were thought to be scientific.

Even teacher training, and many other kinds of training, were judged by numerical criteria, often written into the laws of the several states and expressed in hours and credits without reference to evidence, much less proofs, of individual competence.

Subject matter ceased to have any order of value because procedure dominated substance. Each topic was "worth" in the educational market precisely what any other topic that consumed an equal length of time was worth. Poetry, philosophy, mechanics, fire insurance salesmanship, language, and science were all set at a common level, and that level was established by the number of times a class met each week! So ingrained did this system become that it was referred to as "natural" and "inevitable," despite the fact that it was recent, adventitious, and irrelevant.

Intelligence itself came to be reduced to a number, so that by considering two or three digits it was thought possible to write an individual down as a
moron or a genius. And all that incredible kind of thing was "validated" statistically!

In an attempt to improve the quality of higher education, voluntary "standardizing" agencies began to publish approved lists—lists of colleges, of teachers' colleges, of junior colleges, of schools of medicine or law, and of departments such as engineering, chemistry, and English. The designation "standardizing" agency is in itself significant; it reflected the borrowing of an idea from the scientific management of industry. Even when the name was rejected, the ideal and method slipped into the statistical and quantitative methods characteristic of that type of management. Long questionnaires and schedules gathered data on the number of volumes in the library, the number of square feet in laboratories, the number of faculty members with the doctor of philosophy degree or its equivalent (another interchangeable unit!), and a thousand quantitative details of management, finance, housekeeping, and other matters on the periphery of the educational process. The effect, even when it was not the avowed object, was to make institutions imitative, to make their procedures as nearly uniform as possible in order to make graphic representations of their relative positions. It never strengthened the strong. It is doubtful that it ever strengthened the weak. It certainly served to conceal significant differences beneath a mass of largely irrelevant data.

The passion for standardization extended to educational "measurement." Judgments about individual students by competent teachers were proved statistically to be unscientific and unreliable, and—a terrible indictment in educational circles—subjective. In contrast it was held desirable to use standard tests which preferably should be scored by machinery, in order to withdraw all human contact, and express the result in some pseudo-scientific form. Personality "inventories" were made, and all sorts of terms and procedures reminiscent of business were held to be applicable.

The magic of numbers was so pervasive that education was divided into periods of years which were discussed with as much solemnity as unreality. Arguments about the validity of the idea of junior colleges, their programs, their relationship to secondary education and to university instruction were often tainted by irrelevant data of a statistical nature which, but for the prevailing fashion, would never have received a moment's consideration.

Looking back over the period, it is obvious that procedure was often elevated to a position of importance above that of substance and that the lure of regression equations and coefficients of correlation led to their application in wholly inappropriate places.

It is equally obvious that the vogue for magic numbers is passing. The intelligence quotient is being reexamined; its stability and reliability are questioned, and it is commonly admitted that to express anything so complicated as
human intelligence in so simple a numerical formula is, to say the least, inadequate. Quantitative judgments upon institutions have been shown to have little or no relationship to the quality of the work of any specific individual student. Many other illustrations of the challenge to numbers could be cited.

But mass production methods with students, administrative convenience, ingrained habits, and legislative enactments have so thoroughly enmeshed higher education in this mad numbers game that the way out is difficult indeed. Yet it must be faced. However many the students may be, however carefully they are selected, measured, tested, classified, no two have ever been alike in tastes, interests, aptitudes, and capacities. Whatever validities statistics may have for groups, there is none which explains a single individual. Whatever measures may be devised for the acquisition of data, none can measure individual standards of value, powers of reason, sensitiveness of appreciation or spiritual insights. Yet those are the substance of higher education, and it is folly to neglect them because they cannot be measured, in favor of less important matters which may be more readily detected and numerically assessed.

That some disciplines have at once charmed the mind and enlarged the outlook of man cannot be questioned. Other subjects of study are, by comparison, trivial. The leveling process which relates all to the incidence of the body to a seat, and reduces everything to an artificial and unreal “credit” cannot survive. The humanities, so long scorned, must again come into their own. The basic ideas of science must come forth from beneath the masses of data in which they now often lie concealed; work in the laboratory cannot be measured by clock hours or routine “experiments” but must be judged by power in using scientific method.

Teaching must stand again as a great art—an art to be learned and loved. The pseudo-scientific training which has been the vogue will have salvaged from it what is valid and useful, but methods and techniques must become secondary to richness of personality, love of youth and of truth. Those qualities have been present in many teachers all the time; but they have sold at a disastrous discount in a market raucous with the hawking of degrees based upon training and credits.

Escape from the maze of figures is difficult. We have no thread showing the way back. It may be necessary to cut a new path in order to find our way out, but find it we must. It is the second major problem of higher education.

The third problem is simple to state; as reality leaves, symbols tend to take its place. The long history of religion furnishes manifold illustrations. It is not to be wondered at, therefore, that as the substance of education shrunk through the application of false methods and measures, its symbols became even more precious. Degrees multiplied in number and variety as never before in history. They were sought with an avidity and upon a scale equally remarkable.
All the efforts at "standardization," all the techniques and procedures, being fundamentally irrelevant, failed to produce the substance for which the degree was the symbol. The same degree is given by institutions of all grades to students of every level of intelligence, industry, and achievement. The process has reached a point of such palpable absurdity that many proposals have been made to abolish the baccalaureate degree, or give it after two years of college; to abandon the master's degree, or make it a new collegiate degree; to give up the doctor of philosophy degree, or develop a new one for teachers.

Obviously neither the surrender of the degree nor the alteration of its formal requirements touches the heart of the problem. Degrees, as such, are only tinsel, but men will fight in war for a bit of ribbon, and prize through a long life a medal for the act of a moment. If degrees are abandoned as a symbol of learning, some substitute will have to be found, for where there is substance a symbol will be found. The intelligent solution of this phase of the problem of higher education is to restore the substance for which the symbol stands. Then there will be no need to tinker the symbol.

The last twenty-five years have been dominated by the false "science" of education, while the philosophy of education was permitted to atrophy. But science is now known to have limitations; it does not deal with values and appreciations and insights and powers. We now see that the pioneering experimentalists were wrong in saying that, if they could not find something, it probably was not there. The rhythm of science is such that scientists posit many things which their experimental procedures are still incapable of discovering. And the rhythm of life is such that we know through the experience of the race that there are many of the most precious qualities which no experimentalism can ever reveal. Higher education must take up afresh the philosophic task of finding a coherent pattern, of assessing the several disciplines and giving those which have provided man his greatest enrichment a preferred position. It must restore the individual to the center of its attention. The effort at mass education built upon the analogy of mass production has failed. However many students enroll, the education must be for individuals; mass education is a contradiction in terms. In dealing with the individual it must be recognized that he is different from any other individual—that he is a moral and intellectual integer and not merely the sum of his several parts.

The problem of coherence must be faced in the light not only of the great tradition in education and learning, but in the light of the real achievement of science and transmutations in the forms of political and economic action. If in the last twenty-five years the world has been too much with us, we must not by way of reaction flee the modern world or insist that its achievements are insignificant. Subsidiary to this central task is the task of reform of procedures in order to escape the tyranny of statistics, the madness of numbers, the unreality
of measurements, and all the pseudo-scientific gizmos which have been foisted upon the educative process. These things achieved, the symbols of their result in education may be left to find their own level. Some will be crude and tawdry and not all the pressures from outside will lead to their improvement. Others will be true and just and able to survive public confusion with those less worthy because they represent intrinsic value.

These past years have brought us the richest harvest of students in the history of the world. They have furnished institutions with buildings and books and equipment beyond the dreams of our predecessors. It remains now to turn those instruments to their proper uses, to relegate training to its proper subordinate sphere and restore education to the center of our purpose.