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NEEDED CHANGES IN SECONDARY
EDUCATION

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, February 1, 1916.

SIR: Among the papers read in the conference on education of the Second Pan-American Scientific Congress, held in Washington December 27, 1915, to January 8, 1916, two contain so much of interest and value to those who are responsible for the organization of secondary schools that I have obtained the permission of their authors to have them published for distribution to principals of high schools in the United States. I am transmitting them herewith for that purpose. Since in many important particulars they supplement each other, I recommend that they be printed and bound together as a single number of the bulletin of the Bureau of Education.

Respectfully submitted.

P. P. CLAYTON,
Commissioner.

The SECRETARY OF THE INTERIOR.

THE CHANGES NEEDED IN AMERICAN SECONDARY EDUCATION.

By CHARLES W. ELIOT.

The best part of all human knowledge has come by exact and studied observation made through the senses of sight, hearing, taste, smell, and touch. The most important part of education has always been the training of the senses through which that best part of knowledge comes. This training has two precious results in the individual, besides the faculty of accurate observation—one the acquisition of some sort of skill; the other the habit of careful reflection and measured reasoning which results in precise statement and record.

A baby's assiduity in observation and experimentation and the rapidity of its progress in sense-training are probably never matched in after life.

The boy on a farm has admirable opportunities to train eye, ear, and hand, because he can always be looking at the sky and the soils, the woods, the crops, and the forests, having familiar intercourse with many domestic animals, using various tools, listening to the innumerable sweet sounds which wind, water, birds, and insects make on the countryside, and in his holidays hunting, fishing, and roaming.

The fundamental trades, such as those of the carpenter, mason, blacksmith, wheelwright, painter, hand leatherworker and shoemaker, have provided immensely valuable education for the human race, and have, indeed, been the chief means of raising barbarous peoples to a condition of approximate civilization. To-day, the teaching of those trades, without much use of machinery, is the best mode of developing the natural powers of a backward people.

In noble and rich families some training of the senses was obtained all through feudal times; because the men were brought up to war and the chase, and the women not only shared in some degree the sports of the men, but acquired the manual skill which sewing, knitting, hand-weaving, and embroidering demand.

The advent of mechanical power and machinery has greatly impaired the educational value of many trades, and this impairment has become so common that it may almost be called universal. The

accurate joints a carpenter used to make by the careful use of his own eyes and hands are now made by machines almost without human intervention. The horseshoe which a blacksmith used to turn by hand on his anvil, and temper in his own little fire with a very accurate appreciation of the changing tints of the hot metal, is now turned out by machinery as one of a hundred thousand, almost without touch of human hand or glance of human eye. The ordinary uniformity of a machine product is due to invariability in the action of the machine, and this invariability is a main object from the point of view of the inventor or the proprietor; but that same invariability makes the tending of the machine of little use in the education of the human being that tends it—child, woman, or man.

The difference between a good workman and a poor one in agriculture, mining, or manufacturing is the difference between the man who possesses well-trained senses and good judgment in using them and the man who does not.

It follows from these considerations that the training of the senses should always have been a prime object in human education, at every stage from primary to professional. That prime object it has never been, and is not to-day. The kind of education the modern world has inherited from ancient times was based chiefly on literature. Its principal materials, beside some elementary mathematics, were sacred and profane writings, both prose and poetry, including descriptive narration, history, philosophy, and religion; but accompanying this tradition of language and literature was another highly useful transmission from ancient times—the study of the fine arts, with the many kinds of skill that are indispensable to artistic creation. Wherever in Europe the cultivation of the fine arts has survived in vigor, there the varied skill of the artist in music, painting, sculpture, and architecture has been a saving element in national education, although it affected strongly only a limited number of persons. The English nation was less influenced by artistic culture than the nations of the Continent. American secondary and higher education copied English models, and were also injuriously affected by the Puritan, Genevan, Scotch-Presbyterian, and Quaker disdain for the fine arts. As a result the programs of secondary schools in the United States allotted only an insignificant portion of school time to the cultivation of the senses through music and drawing; and, until lately, boys and girls in secondary schools did not have their attention directed to the fine arts by any outside or voluntary organizations. As a rule, the young men admitted to American colleges can neither draw nor sing; and they possess no other skill of eye, ear, or hand.

Since the middle of the eighteenth century, a new element in the education of the white race has been developing, slowly for a hundred

years, but rapidly during the past fifty. This new element is physical, chemical, and biological science. Through the study of these subjects the medical profession has been revolutionized, and several new professions of high value have been created, such as that of the chemist, of the engineer—civil, mechanical, electrical, or metallurgical—and of the forester. Through the radical work of great inventors and discoverers and of these new professions, all the large industries and transportation methods of the world, and therefore the commerce of the world, have been so changed that the producers and traders of times preceding 1850 would find, if they should revisit the scenes of their labors, that the processes by which they made their livings had completely disappeared. This prodigious change should have instructed the makers of programs for schools and colleges maintained by nations which were undergoing this great revolution in regard to their means of livelihood; but for the most part professional educators have been, and still are, blind to the necessity of a corresponding reformation or revision of the processes of education.

There is one profession, however, in which the educational processes have been adequately changed, but only within recent years, namely, the profession of medicine. The reason for the comparatively early improvement of medical education is that the medical art has always depended, for such measure of success as it attained, on the physician's power of accurate observation and his faculty of reasoning cautiously and soundly on the testimony which his senses gave him. From remotest times the successful physician has been by nature a naturalist. He saw and heard straight, and his touch gave him trustworthy information. He has still, and must always have, the naturalist's temperament, and he must possess the naturalist's trained senses. The reason that medicine and surgery have within 25 years made such astonishing progress is that the practitioner, possessing the senses and mental habits of the naturalist, has been supplied through the progress of biological, chemical, and physical science with wonderful new means of accurate diagnosis. The training the medical student now receives is very largely individual training in the use of his senses; and this training is given by experts in the use of their own eyes, ears, and hands in diagnosis and treatment. The just reasoning follows on the trustworthy observation. What has already been done in medical education needs to be done in all other forms of education, whether for trades or for professions, whether for occupations chiefly manual or for those chiefly mental.

The great increase of urban population at the expense of rural which has taken place during the past 60 years, with the accompanying growth of factories and the crowding together of the working people and their families, has resulted, so far as schools and col-

leges are concerned, in placing more children and youths than formerly under the influence of systematic education and keeping them there for a longer period; but this improvement has been accompanied by a decline in the amount and quality of the sense training which children and adolescents have received. In cities and large towns the trade which a boy chooses, or is assigned to, no longer demands for admission a prolonged apprenticeship. Machinery turns out an ample product, without the need of much skilled labor. - The general result is an inadequate training of the senses of the rising generation for accurate and quick observation.

In recent years, on account of the complexities, urgencies, and numerous accidents of urban life, there has been a striking revelation of the untrustworthiness of human testimony, not because witnesses intended to deceive, but because they were unable to see, hear, or describe accurately what really happened in their presence. This inability to see, hear, and describe correctly is not at all confined to uneducated people. On the contrary, it is often found in men and women whose education has been prolonged and thorough, but never contained any significant element of sense training. Many highly educated American ministers, lawyers, and teachers have never received any scientific training, have never used any instrument of precision, possess no manual skill whatever, and can not draw, sing, or play on a musical instrument. Their entire education has dwelt in the region of language, literature, philosophy, and history, with a brief excursion into the field of mathematics. Many an elderly professional man, looking back on his education and examining his own habits of thought and of expression, perceives that his senses were never trained to act with precision; that his habits of thought permit vagueness, obscurity, and inaccuracy, and that his spoken or written statement lacks that measured, cautious, candid, simple quality which the scientific spirit fosters and inculcates.

A survey of the programs of the existing American secondary schools—public, private, and endowed—would show that, as a rule, they pay little attention to the training of the senses, and provide small opportunities for acquiring any skill of eye, ear, or hand, or any acquaintance with the accurate recording and cautious reasoning which modern science prescribes. The general result of such a survey would be that the secondary schools are giving not more than one-tenth to one-sixth of their force to observational, sense-training subjects. Any school superintendent, teacher, or committee man can verify the results of this analysis in any secondary schools with which he is acquainted.

The changes which ought to be made immediately in the programs of American secondary schools, in order to correct the glaring deficiencies of the present programs, are chiefly the intro-

duction of more hand, ear, and eye work, such as drawing, carpentry, turning, music, sewing, and cooking; and the giving of much more time to the sciences of observation—chemistry, physics, biology, and geography, not political, but geological and ethnographical geography. These sciences should be taught in the most concrete manner possible—that is, in laboratories, with ample experimenting done by the individual pupil with his own eyes and hands, and in the field through the pupil's own observation guided by expert leaders. In secondary schools situated in the country the elements of agriculture should have an important place in the program, and the pupils should all work in the school gardens and experimental plats, both individually and in cooperation with others. In city schools a manual training should be given which should prepare a boy for any one of many different trades, not by familiarizing him with the details of actual work in any trade, but by giving him an all-round bodily vigor, a nervous system capable of multiform coordinated efforts, a liking for doing his best in competition with mates, and a widely applicable skill of eye and hand. Again, music should be given a substantial place in the program of every secondary school, in order that all the pupils may learn musical notation, and may get much practice in reading music and in singing. Drawing, both freehand and mechanical, should be given ample time in every secondary school program; because it is an admirable mode of expression which supplements language and is often to be preferred to it, lies at the foundation of excellence in many arts and trades, affords simultaneously good training for both eye and hand, and gives much enjoyment throughout life to the possessor of even a moderate amount of skill.

Drawing and music, like other fine-art studies, were regarded by the Puritan settlers of New England and by all their social and religious kindred as superfluities, which, if not positively evil, were still of wasteful or harmful tendency, and were, therefore, to be kept out of every course of education. By many teachers and educational administrators music and drawing are still regarded as fads or trivial accomplishments not worthy to rank as substantial educational material; whereas they are important features in the outfit of every human being who means to be cultivated, efficient, and rationally happy. In consequence, many native Americans have grown up without musical faculty and without any power to draw or sketch, and so without the high capacity for enjoyment, and for giving joy, which even a moderate acquaintance with these arts imparts. This is a disaster which has much diminished the happiness of the native American stock. It is high time that the American school—urban or rural; mechanical, commercial, or classical; public, private, or endowed—set earnestly to work to repair this great loss and damage.

Although considerable improvements have been recently made in the programs of American secondary schools, especially within the past 10 years, or since vocational training has been much discussed, multitudes of Americans continue to regard the sense-training subjects as fads and superfluities. They say, let the public elementary schools teach thoroughly reading, writing, spelling, and arithmetic, and let natural science, drawing, music, domestic arts and crafts, and manual training severely alone. Let the secondary schools teach thoroughly English, Latin, American history, and mathematics, with a dash of economics and civics, and cease to encumber their programs with bits of the new sciences and the new sociology. This doctrine is dangerously conservative; for it would restrict the rising generations to memory studies, and give them no real acquaintance with the sciences and arts which within a hundred years have revolutionized all the industries of the white race, modified profoundly all the political and ethical conceptions of the freedom-loving peoples, and added wonderfully to the productive capacity of Europe and America.

If anyone asks how it can be possible that these new subjects, all time-consuming, should be introduced into the existing secondary schools of the United States, the answer—adequate, though not easy to put into practice—is, first, that the memory subjects and the mathematics should be somewhat reduced as regards number of assigned periods in the week; secondly, that afternoon hours should be utilized, or, in other words, that the school day should be lengthened; and thirdly, that the long summer vacation should be reduced. It is worse than absurd to turn city children into the streets for more than two months every summer. Since the new subjects all require bodily as well as mental exertion, they can be added to the memory subjects without any risk to the health of the children, provided that the shops, laboratories, and exercising rooms be kept cool and well ventilated. In rural schools a good part of the new work in sowing, planting, cultivating the ground, and harvesting must be done out-of-doors. The observational, manual, and scientific subjects often awaken in a boy or young man for the first time an intellectual interest and a zeal in work which memory studies have never stirred. Hand-and-eye-work often develops a power of concentrated attention which bookwork had failed to produce, but which can be transferred to bookwork when once created. All the new subjects require vigorous and constant use of the memory, and give much practice in exact recording, and in drawing only the limited and legitimate inference from the recorded facts.

The suggested changes in American school programs will not make public school life harder or more fatiguing for the pupils. On

the contrary, observational study and concrete teaching are more interesting to both children and adults than memory study of any sort; and whenever the interest of pupils is aroused, it brings out more concentrated attention and harder work, but causes less fatigue. The obvious utility of mental labor directed to a practical end increases the interest the pupils take in their work, and stimulates them to effective effort. To use a good tool or machine and get the results it is competent to produce when in skillful hands, is vastly more interesting than reading or hearing about the uses of such a tool or machine. Whenever, by the use of observational and concrete methods, the pupils' power of attention and of concentrated effort is developed, that power of attention once acquired can be exercised in other subjects. This principle holds true not only of manual or bodily labor but also of games and sports, and of cooperation in rhythmical movements, like dancing. The power of concentrated attention won in carpentry, turning, forging, or farm work is easily transferred to work in reading, writing, and ciphering, or at a later stage in history, literature, and civics; so that the reduction in the so-called academic studies made to allow the introduction of observational studies need not result in less attainment in the academic studies themselves.

For this great improvement in the conduct of American secondary schools a good deal of preparation has already been made. The new schools of mechanic arts, the trade schools, the various endowed institutes for giving a sound training in applied science, and such institutions as the Hampton Institute and Tuskegee Institute are showing how to learn by actual seeing, hearing, touching, and doing, instead of by reading and committing to memory. They have proved that the mental powers, as well as the bodily powers, are strongly developed by the kind of instruction they give; so that nobody need apprehend that reduced attention to memory subjects, with increased attention to the training of the senses, the muscles, and the nerves, will result in a smaller capacity for sound thinking and for the exercise of an animating good will.

It is not the secondary school alone which needs to be reformed; the elementary school needs to set a different standard of attainment, not lower or easier, but, rather, higher and harder; a standard in which the training of the senses shall be an important element.

If the elementary and secondary schools served well boys and girls from 6 to 18 years of age, the main reform would, in time, be accomplished. It is but a small percentage of the youth of the country that go to the colleges and the higher technical schools; and the parents of this small percentage are often able to provide their children with opportunities for securing, outside of their systematic educa-

tion, a well coordinated use of all their senses and nerves, such as a violinist, organist, pilot, locomotive engineer, or sharpshooter requires. The educational publicist must keep in mind the interests of the 95 per cent of the children, rather than those of the 5 per cent; for it is on the wise treatment of the mass of the population during youth that a modern democracy must rely for assuring the public health, prosperity, and happiness.

If the educational material and the method of instruction were right, the training given in the grades would be just as good for the children who leave school at 14 as for those who go on till 18, and the training in the high school would be equally appropriate for pupils who do not go to college as for those who do. The progressive sense-training from beginning to end of systematic education is desirable for all pupils, whatever their destination in after life, and should prepare every pupil for his best entrance on earning a livelihood, at whatever age that necessity is to come upon him. It should be the same with the language and history studies in every public-school program. At every stage, or in every grade, they should be suitable for every pupil, no matter what his destination. Flexibility and adaptation to individual needs would still be necessary in the programs, first, in order to enable the individual pupil to concentrate on the studies he prefers and excels in; and secondly to enable pupils of different capacity to advance at different rates.

The adoption of these principles would solve justly problems in the American tax-supported system of public education which have been in debate for generations.

It must not be imagined that any advocate of more sense training in education expects to diminish the exercise of the reasoning powers or of the motive powers which distinguish man from the other animals, or to impair man's faith in the spiritual unity of the world, or his sense of duty toward fellowmen, or his sympathies with them. The devotees of natural and physical science during the last 150 years have not shown themselves inferior to any other class of men in their power to reason and to will, and have shown themselves superior to any other class of men in the value or worth to society of the product of those powers. The men who have done most for the human race since the nineteenth century began, through the right use of their reason, imagination, and will, are the men of science, the artists, and the skilled craftsmen, not the metaphysicians, the orators, the historians, or the rulers. In modern times the most beneficent of the rulers have been men who shared in some degree the new scientific spirit, and the same is true of the metaphysicians. As to the real poets, teachers of religion, and other men of genius, their best work has the scientific quality of precision and truthfulness; and their rhetorical or oratorical work is only their second best.

The best poetry of the last three centuries perfectly illustrates this general truth. Shakespeare wrote:

I know a bank whereon the wild thyme grows.

The florists now tell us that thyme will not thrive except on a bank. George Herbert wrote:

Sweet day, so cool, so calm, so bright;
The bridal of the earth and sky,
The dew shall weep thy fall to-night,
For thou must die.

Precision of statement could not go further; thought and word are perfectly accurate. Emerson said to the rhodora:

The selfsame power that brought me here,
brought you.

A more accurate description of the universal Providence could not be given. Even martial poetry often possesses the same absolute accuracy:

Oh! Tiber, Father Tiber,
To whom the Romans pray,
A Roman's life, a Roman's arms,
Take thou in charge this day!

Cannon to right of them,
Cannon to left of them,
Volleyed and thundered,
Into the jaws of Death
Rode the six hundred.

When human emotions are to be stirred, and human wills inspired, it is the accurate, perfectly true statement which moves most, and lasts longest:

Greater love hath no man than this: that a man lay down his life
for his friends.

The most exact, complete, satisfying, and influential description of true neighborliness in all literature is the parable of the Good Samaritan:

Which of these three, thinkest thou, proved neighbor unto him that fell among the robbers? And he said, He that showed mercy on him. And Jesus said unto him, Go and do thou likewise.

It is an important lesson to be drawn from The Great War that under the passionate excitements and tremendous strains of the widespread disaster the medical profession and the nurses of all countries are holding firmly to that exact definition of the neighbor, and are obeying strictly the command, "Do thou likewise." These are men and women who have received thorough training of the senses without suffering any loss of quick sympathy or of humane devotion.

Rhetorical exaggeration, paradox, hyperbole, and rhapsody doubtless have their uses in moving to immediate action masses of ordinary men and women; but they are not the finest weapons of the teacher and moralist:

Speaks for itself the fact,
As unrelenting Nature leaves
Her every act!

SUPPLEMENTARY STATEMENT.

[The illustrative statement which follows did not form part of the paper as presented at the Congress, but was furnished by Dr. Eliot for use in "Occasional Papers No. 2," issued by the General Education Board.]

The proportion of attention given to observational and scientific subjects in secondary schools in comparison with that given to linguistic, literary, mathematical, and historical subjects, may be illustrated by analysis of the programs of a few typical schools.

1. In a New York high school which maintains the traditional four years' high-school course, and a course intended to prepare for commercial work, the number of recitation periods offered in the four years are respectively 21, 25, 25, and 35—a total of 106; and out of these 106 periods each pupil is required to attend 72 periods, being 18 periods per week throughout the four years. The number of options is small during the first three years, but large in the fourth year. Out of these 106 periods, 24 had some possible element of observational work; but these could all be avoided by any pupil who wished to do so, unless, indeed, the pupil was hoping to enter a college which demanded the elements of some one science for admission. There were in the school no laboratories for physics, chemistry, or biology. The commercial course contained only 77½ periods, of which 72 were required. Of the 77½ periods 10 had possibly, but not necessarily, some element of observational work. This school has lately come into possession of a new building which contains well-equipped laboratories for physics, chemistry, and biology, and is this year (1915-16) offering for the first time a noteworthy course in agriculture which includes 18 periods of English, 10 of history, and 10 of mathematics, but also 10 for science and 30 for agriculture, including laboratory and shop work, field trips, project work at home, and classroom work. The instructor for agriculture is engaged for the entire year, and will spend his summer with the boys who pursue the agricultural course.

2. In an excellent high school in an important western city there were 34 teachers in 1914-15 who gave full time on the weekly program of the school, of whom one taught physics with the laboratory method, one chemistry with the laboratory method, one zoology and physiology with the laboratory method, two mechanical drawing and manual arts, and one free-hand drawing. Thus, about one-sixth of the actual teaching force was teaching subjects which might fairly be called observational. This school maintains a normal course which requires a good two years' course in free-hand drawing, given 5 days in the week, for 40 minutes a day. There being no prescribed outline of work in music, the different high schools in this city make out each its own course in music. One of them maintains an excellent course in music covering the first two years out of the four; but the high school, the composition of whose

staff is partially analyzed above, gave no course in music because of lack of accommodations. In general, a course in music is required of pupils in this city only if they select that high-school course which is called the normal course. Free-hand drawing is not required, except in the normal course. Since the city provides in its high schools more instruction than any one pupil can take, it is possible for pupils to graduate creditably from a high school without having devoted even one-sixth of their time to observational studies.

3. In another large western city the high schools provide seven different courses, among which each pupil chooses one. In three of these courses memory studies have the usual preponderance; but in the other four, called Art, Manual Training, Domestic Art and Science, and Commercial, there is an unusual proportion of observational or vocational studies. The city spends money liberally in its high schools for instruction in drawing—both free-hand and mechanical—manual training including joinery, turning, pattern-making, molding, forging, and the domestic arts and sciences knowledge of which is especially desirable for girls, and in botany, physiology, physics, and chemistry. Botany and physiology are only half-year subjects. All science subjects have five periods each per week, usually divided into three recitations and one double laboratory period. In the art course, art drawing is required during the four years, and is given in double periods each second day.

In the course called classical, the proportion of observational studies accessible to the pupil is very small; but in the courses called art, manual training, and domestic art and science it is fairly large, while in the courses called general and scientific the proportion of observational studies is identical and approaches one-sixth of the total time demanded from the pupils by either of these courses. In the course called scientific, of the 20 units required for graduation, 4, or one-fifth of the whole, must be in science. In the general course, 18 units being required for graduation, 2 must be in science; and these 2 may be increased to 3 or 4—that is, one-ninth of the total number is required for science, and this proportion may be increased by election to one-sixth or even to two-ninths.

Music in these schools consists of chorus singing taught for two periods a week for four years; but music is not enumerated among the studies of the schools, being regarded as extra or outside the regular program. The word "music" does not occur in the printed programs of the seven courses. Art drawing, mechanical drawing, manual training, and domestic art and science require but little preparatory study in connection with the work done in the periods assigned to these subjects on the programs. Physics, physiology, chemistry, and physiography require preparatory study, but not so much as the language studies and the mathematical. It has been proved in the high schools of this city that girls devote more time than boys do to study in preparation for the recitation periods of the high-school programs.

4. In an old secondary school maintained wholly at public expense and devoted for many years to classical learning, the present course of study includes the following observational studies: In the first year 2 periods a week in elementary science and 2 in physical training—these two subjects together having 4 out of 25 periods per week, and being represented in the second and third years in the same proportion. In the fourth and fifth years there is no scientific study whatever. In the sixth and last year of the course physics has 5 periods out of the 25, with lecture demonstrations and laboratory work throughout the year. In the last four years of the course the physical training consists exclusively of military drill—that is, the setting-up drill, the manual of arms, marching, and company and battalion movements. In all the physical training

given at this school there is hardly any training of the powers of observation. Neither music nor drawing is a subject of instruction. Laboratory work in the elementary science of the first year and in sixth year physics occupies about half of the time allotted to those subjects in the program; but many pupils who are proposing to go to college give additional time to the laboratory study of physics.

5. A public school situated in a New England city combines a well-developed English high-school course with an equally well-developed classical course intended to prepare boys and girls for admission to colleges of high standing. This school teaches physiology, chemistry, and physics partly by the laboratory method and is well equipped for such work. It also gives much instruction in penmanship, stenography, and typewriting, but chiefly for pupils who take the commercial course. Drawing is an elective study open to all pupils, ordinarily for two periods (of 45 minutes each) a week. Physical training is an elective subject open to all girls for two periods a week, but not to boys. The school maintains two large chorus classes, and an orchestra of about 50 pieces, each meeting once a week. There is a class in harmony which meets twice a week. The boys' glee club and the girls' glee club meet outside of the school. All music work is elective, but is under the personal supervision of the director of music employed by the school committee. The school does not provide any form of manual training; perhaps because it has an alliance with a technical school close by.

On account of the many kinds of pupil in this school, and of the large volume of instruction needed to meet their various wants, the best way to estimate the proportion of the school's energy which goes into the teaching of observational and scientific subjects is to compare the number of teachers employed in the school for those subjects with the number employed for the languages and literatures, and for history, civics, and mathematics.

There are 79 teachers, of whom 13 are men. Out of these 79, 12 teach subjects which may be said to include a considerable proportion of training of the senses; namely, drawing, physiology, chemistry, physics, and physical culture. Of these 12, 2 are men giving full time, and 1 is the musical director, who gives 5 hours a week. One female teacher gives only part of her time to a subject belonging in this category—physiology. Another, a teacher of physiology, gives part of her time to a commercial subject. It appears, therefore, that 15½ per cent of the school's energy goes into the teaching of subjects of an observational and scientific quality, and 84½ per cent into instruction in languages, literature, mathematics, history, and civics. The individual pupil may devote either somewhat more or somewhat less than 15 per cent of his attention to observational and scientific subjects.

6. In an old New England academy the prescribed studies are exclusively linguistic and mathematical with the following exceptions, a course in physical training which requires four hours a week throughout the academy course, and courses in physics, chemistry, and drawing, which are optional studies open to the two upper classes only. Languages—ancient and modern—and elementary mathematics occupy the great majority of the teachers, and almost all the time of the ordinary pupil. Regular instruction in music is, however, provided for members of the glee club and the chapel choir and of the mandolin club and the orchestra. The study of music, however, is completely voluntary and outside of the regular course of the academy. In 1914-15, 82 teachers were employed in this academy, 8 of whom were devoted to the teaching of physics and chemistry, and 2 to the instruction in physical training. This academy maintains laboratories for physics, chemistry, and mechanical drawing, and allows the pupils in these subjects to devote two hours twice a week to

laboratory work in these subjects. The voluntary instruction in music—both vocal and instrumental—is given one evening a week for about seven months; but much more time is given to music by individual pupils. An examination is required for admission to any one of the musical clubs. Membership in these clubs is considered an honor, and regularity of attendance at their rehearsals is strictly enforced.

7. Another endowed academy in New England maintains two courses of study—one called the classical, the other the scientific. In the classical course no observational subject whatever finds place, except optional physics and chemistry, each four periods a week in the senior year, and optional mechanical drawing for two periods a week in the senior year. The scientific course makes chemistry and physics elective one year earlier than the classical, and therefore perhaps permits the pupils who elect it to advance further in these two subjects. This academy possesses laboratories for physics and chemistry, and teaches both these subjects by the laboratory method. Opportunity is offered for the study of piano, organ, and harmony; but this instruction does not make part of any course of study maintained by the academy. The subject of drawing other than mechanical drawing is not mentioned either in the course of study or in the elaborate constitution of this academy. Memory subjects have an overwhelming preponderance over observational.

8. In a good, partially endowed, New England school which is intended for sons of well-to-do people, the total number of recitation hours contained in the six years' program of studies is 185, of which only 28 contain an element of observational work; and to arrive at this figure 28, there must be included in it all the hours given to physical training, namely, 12, and 1 hour a week given in the two earliest years to singing. Of the other 14 hours, 5 are devoted to manual training, 5 to physics, and 4 to chemistry, physics being a required study and chemistry an alternative for Greek. In this school nearly the whole weight of instruction is applied to languages, mathematics, and a moderate proportion of historical teaching, in which is included the history of English literature.

9. In another similar (also preparatory) school, partially endowed, four distinct courses are maintained in each of the four years. One of these is called the scientific course, because it is intended to prepare candidates for admission to a scientific school rather than to a college. This course prescribes a little more science in the lower middle (second) and senior years than any one of the other three courses, but out of its 79 periods of recitation in the four years only 7 are devoted to science of any sort. All the rest are given to languages, history, and elementary mathematics. No drawing is taught in the school and no music, except during 1 hour a week for those pupils who desire it—about one-fifth of the whole number.

10. In an excellent private school for boys situated in New England the five years' course of study shows a small proportion of expenditure for instruction in observational and scientific subjects. Instruction is provided for 139 periods a week of 40 minutes each. Out of these only 16 periods are devoted to observational and scientific subjects, all put together, being 11½ per cent of the total instruction offered. Out of 11 teachers 2, or 18½ per cent, give their whole attention to manual training, sloyd, drawing, physics, and chemistry; and these teachers are provided with facilities for teaching carpentry, wood carving, basketry, metalwork, and clay modelling, and with well-equipped laboratories for teaching physics and chemistry. The school also pays unusual attention to systematic athletic sports and exercises under careful supervision. It should be mentioned also that the spirit of the teaching in such subjects as languages and geometry is unusually observational, and the methods as far as possible

inductive and concrete. It is one of the very few schools in the country which provides in its junior department of two preliminary years (not included in this statement) a teacher who takes the younger boys on observational walks in the country and older boys on trips to commercial plants, where the practical applications of physics and chemistry in the industrial arts may be seen. The school building contains a gymnasium; but the school puts its emphasis on out-of-door exercises in winter as well as in spring and fall, and, to carry out this policy, has a good field and a well-equipped field house. In its course of study and its announcement for 1914-15 the word "music" does not occur, except as one subject among many for 10-minute morning talks. Like some other schools mentioned in this appendix, this school has made significant improvements in its program for 1915-16.

11. In a good private secondary school for the sons of well-to-do families recently organized and partially endowed in a New England town there are six classes or years which exhibit varying percentages of observational studies. For the youngest, or Class VI, science has 3 periods out of 25 provided. In Class V political geography is the only subject that could be called scientific, and this subject has 2 periods out of 25. In Class IV science, which is physiology and hygiene, is assigned 2 periods out of 19. In the three classes already mentioned manual training is provided for two periods a week and music is taught for one period; but for these periods no previous preparation by study or practice is required of the pupils. In Class III forestry replaces the manual training, and no other science appears in the work of the year. In Class II physics, with four periods and two hours of laboratory work, is offered as an alternative for Latin with five periods; and elective science is offered for two periods more. Manual training for two periods reappears in the program of this year, and the one period for music is continued. For Class I the school offers instruction covering 37 periods, of which chemistry and physics have each four periods with two hours of laboratory work in each. There is an option between these two subjects. Two periods are given to manual training and one to music, as before. One period a week is given to music in every one of the six years of this school. The boys are taught first to read music and then are trained in part singing. Incidentally they learn a little about harmony and about the technique and the various forms of musical composition. In the first class (last year) appreciation of music is taught in connection with the study of famous works. The school also provides teaching for two glee clubs and the school chorus, which are voluntary pupil organizations. In the final year (Class I) each pupil selects from the 37 periods of instruction, with the advice and approval of the head master, a course of study suited to his own needs, the amount of instruction provided by the school being at least twice as much as any single pupil can advantageously take.

12. In an excellent secondary school for girls situated in New England the whole course is divided into eight classes, each of which has some instruction in sight singing, the use of the voice in reading and speaking, and gymnastics. In the first year, or Class I, of the school, and out of a total of 19 periods in the week, 1 period is devoted to elementary science, without the use of any textbook, and 2 periods are devoted to drawing, color work, and writing. In the next year of the school, Class II, out of 21 periods, 1 period is devoted to botany and 2 periods for half the year to physical geography, and the time devoted to drawing, color work, and writing is the same as in the first year. In the third year, Class III, out of 21 periods, 1 is given to the elements of zoology, no textbook being used, and 3 periods are devoted to sewing, stenciling, and color work. In the fourth year, Class IV, instruction is given in the elements of domestic

economy, cooking, leather work, and color work, and 4 periods are used for these subjects, but leather work and color work are elective subjects. In the fifth year, Class V, color work, copying at the Boston Museum of Fine Arts, carving, and drawing are taught as elective subjects, each for one period, but the copying at the Art Museum is done in the afternoon outside of school hours. This special opportunity at the museum may be used once a week in the afternoon in each of four years of the program. In the sixth year, Class VI, 8 periods out of 29 are used for general science, and of the 29 periods, 5 are assigned to elective Greek. In the seventh year, Class VII, out of 37½ periods, 2 periods are assigned to physiology and 3 to chemistry as elective studies, and Greek is again elective for 5 periods. The pupil may not take 5 hours of science in Class VII. In the eighth and last year of the regular program, Class VIII, out of 54 periods of instruction provided by the school, a large majority of which are elective, the pupil may, if she wish, devote 3 hours to physiology, 7 to chemistry, 2 to drawing, and 3 to music, thus giving a large part of her time to observational studies. Such a course would not, however, lead to a diploma, since with 15 hours given to observational work most pupils would find it impossible to meet the requirements of the school in regard to history and language. The number of recitation periods for members of the older classes averages 18 a week.

This school employs 8 room teachers, all of whom teach subjects not observational, and 31 department teachers, not all of whom give full time. Of the department teachers, 2 teach science, properly so called, 2 teach musical subjects, 3 artistic subjects, and 7 teach various forms of household economics, games or sports, and gymnastics. Approximately one-third of the teaching force is employed on observational, scientific, or skill subjects.

The excellent building of this school contains, besides the ordinary classrooms and recitation rooms, 6 music rooms, 3 laboratories, 2 play rooms, a gymnasium with a stage suitable for concerts, tableaux, and plays, a swimming pool, drawing and wood-carving rooms, a studio, and a domestic-science kitchen. This fact, as well as the varied instruction provided, shows that the school pays unusual attention to observational studies and to the acquisition by nearly every pupil of some sort of bodily skill.

13. The manual-training or technical schools of the country, in the secondary grade, generally retain in their courses a considerable amount of what is called academic work—that is, instruction in languages, history, and mathematics—but their programs contain a large proportion of studies which may properly be called observational, such as carpentry, printing, music, both vocal and instrumental, drawing, both mechanical and free-hand, pattern making, forging, chemistry, and physics. These schools offer a course in elementary science which gives a general view of science, and is provided for the purpose of arousing the interest of the pupils in the scientific method and its fruits. They usually offer a variety of industrial courses, such as courses in which printing, free-hand drawing, mechanical drawing, electricity, woodworking, or ironworking is the leading subject; and these courses naturally vary considerably in regard to the observational studies selected for each course. In all such courses the proportion of elective subjects is larger than in the ordinary high schools and academies; and the observational studies are apt to appear in the list of electives, although some of them frequently appear in the list of required studies. On the whole, the usual predominance of memory subjects disappears in the programs of these schools, doubtless for the reason that they really attempt to prepare boys for specified industrial careers. For decided success in any good modern trade or industry, a reasonable amount of sense

training is almost indispensable. In all such schools chemistry and physics are taught, with some use of the laboratory method. Drawing, both mechanical and free-hand, has its proper place in the appropriate programs of technical schools, and through it an invaluable training of both eye and hand can be acquired. Some of these schools pay more attention to music than the average high school, although the work in music is generally elective. In order to give time for working in the shops and laboratories these schools usually extend the school day at least two hours into the afternoon without objection on the part of the pupils, because the value of the shop and laboratory work is as plain to them as it is to the teachers.

THE SECONDARY SCHOOL AND THE UNIVERSITY.

By ERNESTO NELSON.

In his remarkable paper Dr. Charles W. Eliot has shown that the most vital need of secondary education is that of enlarging the pupil's opportunities to attain bodily skill and to train his habits of reasoning.

Dr. Eliot's plea is but the latest presentation of the twentieth century educational ideals. Long years of educational unrest as an outcome of methods of teaching whose chief purpose was the storing of the mind with the information given out by books have made us realize how much this kind of education falls short of the demands of modern life.

Considering that Dr. Eliot's plea is being duplicated in every civilized country of the world, and that it is not a new plea, it does seem wonderful that the realization of the ideal it expresses should still demand the combined efforts of the foremost educators of all lands. The purpose of the present paper is to analyze the secondary education of to-day with a view to discovering some of the obstacles that are in the way of the educator's dream and, if possible, to offer a new contribution to the problem.

It is unnecessary to dwell on the distinction between the education that tends to equip the student with specific information and that which aims to organize the activities of the mind and body so as to make man "an independent ego, the master of himself and his environment." These two ideals of education may be contrasted as representing the old and the new, although both are rightfully represented in modern systems of public education. Just as in the surface of the earth rocks of various ages contribute to make up the soil on which man lives, so the educational fabric still shows evidences of the successive stages of educational evolution. Thus, however wonderful the changes have been in the content of the modern university as compared with the old, it must be admitted that the university is, of all the links of the educational chain, the one that retains more of the original character and spirit of education as a social activity, namely, to equip the student with specific information. At the other

end of the chain the primary or graded school, and more prominently the kindergarten, have been freer to enter into the spirit of the new education and are instituting methods of work more and more in harmony with the growing belief that in the education of the child and the adolescent knowledge should be a sort of by-product, however precious, in the process of education, and that the vital question is the performing of the process itself, to which end ample opportunities should be given for the right training of the senses and the application of the reasoning powers.

The university on the one hand and the kindergarten on the other are, then, two extreme types of educational aims. It would be desirable if the influence of the kindergarten on the university were stronger than that of the university on the kindergarten. Unfortunately educational schemes do not partake of the nature of biological processes, in which every particle added to the morphological frame, every subsequent function of the organism, is conditioned to the materials already present in that organism. On the contrary, the educational fabric may be likened to a building in which every piece of material is used with due regard for the weight of that which will be placed above. Thus the password of education is "Preparation." We seem to be still far from the time when we shall have the courage to make life itself and business and culture, a natural "continuance" of those methods of education which will have proved to be more conducive to bring out the latent powers of man.

In controlling the educational process which takes place in the individual, it has become a commonplace principle that the educator should take care of present stages of psychological evolution and let future processes take care of themselves. Should not the above principle apply to the framing of the educational scheme from the kindergarten up to the university, so that the controlling factors in the curriculum may be the present and actual needs of the student, with a view to taking fullest advantage of previous educational training? The university has seldom shown a disposition to thus serve the educational needs of the individual. Curiously enough, the institution which ought to have changed most to expand properly the added potentialities stored in the ever-enriched mind of the child and the adolescent of to-day, is the one that has changed least. Not only this, but the university has directly influenced the spirit of the institutions under it and succeeded in forcing down its own interpretation of education.

Truly the university has rendered education the great service of first conferring on it a concrete and visible value. The spectacular triumphs of university education have made the university the educational institution "par excellence," and therefore its methods, aims, and results have tacitly become universal educational standards

always to be taken cognizance of in educational pursuits. In this way the university has tended to perpetuate, to fix, and to consecrate, so to speak, the view that education should primarily be concerned with the possession of a certain amount of information. This is the reason why the university has controlled and is still controlling educational standards and educational values throughout all the educational organization.

In the secondary school of to-day, therefore, and, to a certain extent even in the primary school, knowledge-getting is still the prominent activity, throwing into the shade all other activities more vitally concerned with the character-forming end of education. Information is what may be called the building blocks of the present system of education. Information is the factor that conditions the pupil's progress through school and is so far the only test universally accepted as a measure of the amount of education given or received. The curriculum, the textbook, the examination paper are the most important pieces of the educational machinery. And this costly and formidable machinery is not concerned, as one should think it ought to be, with the self-development of the student and the testing of the real progress of his personality, but solely with standardizing, circulating, and testing the amount of information a person has to receive in order to be worthy of the privilege of being educated by the State.

As it is, then, is not the secondary school still an anachronic institution? The educational machinery has varied but little in essence from what it was a hundred years ago; the curriculum may have been enriched by the progress of science, but it still remains the official catalogue of facts the student has to acquire. The modern textbook may be more appealing than ever before to the thinking powers of the reader, but it is not the less a servant to dogmatism and an accomplice in maintaining the sway of authority. Both the curriculum and the textbook clearly proclaim that even to this day the important thing in secondary schools is memorization, not self-activity, and that although methods have been instituted that make the student use his reason in learning, the important thing is not the promotion of the educational activity for its own sake, but the supplying of the student with the information that is the outcome of such activity.

Says John Dewey:

Any examination of the prevailing modes of instruction will show that the mere bulk of matter communicated in books and lectures tends to swamp the native and active interests operative in intelligent behavior and in the acquaintanceship it brings. There this matter remains unassimilated, unorganized, not really understood. It stands on a dead level, hostile to the selective arrangement characteristic of thinking.

Had the secondary school disconnected itself from the university, had it been obliged to respond, as it is beginning to respond to-day, to the demands of modern life, its conservative methods would have long ago been superseded by more liberal principles of education. To create and keep its patronage the secondary school would have appealed to the practical sense of the community, catered to the needs of modern life, somewhat in the way the modern public library is doing to-day. And just as the latter institution is throwing its doors open before a prospective reader, so the secondary school, free from university bondage, would have instituted countless schemes of attracting the prospective student. No price would be asked for such service, whose real recipient is the nation at large. None of the present petty restrictions that check free progress through school and are the survivals from an age in which all education was necessarily preuniversitarian would in such a case be tolerated.

Were the primary and secondary schools absolutely free to set forth their own interpretation of culture, education would have been organized on broader, liberal, and all-inclusive lines. The overwhelming cultural prestige of the university has made education retain much of its character as a system of organized restriction, just as when education had no meaning save as that of a preparation to a privileged position in an aristocratic society. Even to-day the term "educated class" is far from meaning what it should, namely, "normal men and women, intellectually, morally, and physically sound." It is suggestive of autocratic privilege, of something that, far from being accessible to every normal being, is precisely not within the reach of all.

But education should be within the reach of any person, for it is the complement to life itself. Education is not only a knowledge-giving agency, it is the maker of man himself, and democracy can not afford the waste of opportunities brought about by the constant checking to which every one attempting to pass through school is subjected. The fact that out of 100 pupils entering the primary school only from 5 to 20 (according to countries) graduate from the high school shows a frightful waste, which, besides indicating lack of power to adapt institutions to the needs of the individual, works directly against the vital interests of democracy.

The salvation of the secondary school, therefore, lies in abandoning university standards in the valuation of primary and secondary education, in asserting positively its own standards of culture, founded in the perfection of those activities whose operation makes man attain his full spiritual stature.

Nothing is further from the purpose of this paper than the idea that knowledge should receive little attention in the field of education. In fact, knowledge could not possibly be separated from the

process of education. Wherever there is self-activity, knowledge of some kind is sure to come as a result. Just as heat is the dynamic equivalent of physical energy, so knowledge is the intellectual equivalent of a useful psychic activity. Science is mind made, and has also made man's mind. Science is the specific subject matter to which the mind may usefully apply itself. It is the food on which the mind grows.

But if there can be no education without knowledge getting, there is a considerable amount of knowledge getting that does not promote a corresponding educational activity.

This counterfeit knowledge is the kind of knowledge resulting from undue stress on the knowledge-getting side of education. Such counterfeit knowledge is the result of dogmatism, and dogmatism itself is but the time-saving device more readily resorted to under the pressure of an educational system emphasizing knowledge getting.

It is particularly important to make clear the following considerations: Any system of education whose chief aim is the conveying of specific information is in danger of accomplishing that end at the expense of genuine educational training. A host of devices will soon make their appearance to serve the prime purpose of conveying information, neglecting the most important part of learning. The whole scheme of educational paraphernalia, of which the textbook is the most conspicuous representative, has been devised with the purpose of conveying information in a direct way, thereby paving the road to dogmatism. On the other hand, an educational system whose only and deliberate aim should be the exercise of mental activities by applying them to the vast cosmorama of things and phenomena which surround us, would yield a wealth of information that would be far more beneficial to the student than if that information had been communicated in a direct way. In other words, if information such as can be elicited from the student through educational tests at present in use in the classroom and at examination time were always a conclusive evidence of a previous educational activity, there would be no harm whatever in accepting the former as the proper measure of and as an equivalent to the latter. But as long as it is possible to master the so-called knowledge by purely memory exertion it is evident that present methods that bring stress on the testing of such knowledge are sure to mean a constant defeat of the very ends of education.

Inasmuch as practices designed chiefly for the purpose of getting knowledge may be detrimental to education, and inasmuch as sound educational activities are invariably followed by the acquisition of genuine knowledge, the thing to do is so to organize the school activities that knowledge of the genuine kind may come as a result of the performance of such activities. In other words, if education is

an inner process and not an outward result, the obvious need is to organize that process. Up to the present the school authorities have been busy organizing knowledge, not education. The school program of to-day is made up of carefully distributed information among the successive stages of school work. We have yet to devise a system of activities of really educational significance. The laboratory method has been a step in that direction, but an immense amount of such organization, to make it consistent throughout, remains to be done in all departments of learning.

If the significant part of the educational process is in the act of putting the powers of the child in operation so-as to automatically produce results that are physically and spiritually beneficial, then it may safely be said that the only educators worthy of the dynamic significance of the term are the kindergarten teachers, the manual-training teachers, the drawing teachers, and the teachers of physical training. They are not concerned with the transmitting of information for its own sake. They preside over an activity, the performing, on the part of the pupil, of a set of actions which science and experience have shown to be of educational value to the child. They let nature do the rest.

When we have planned the exercises a boy has to perform with the dumb-bells, we know that he will be better off physiologically and that he has added some oxygen to his blood. We trust nature then. But we seem to lack a corresponding faith in nature and in the pupil's power to enrich his intellectual store by the mere fact of his performing a set of intellectual activities. Yet this is exactly what must be done if a system is to be devised that truly responds to present conceptions of education. The slogan should be: "Let us train and let knowledge take care of itself."

When a set of occupations has been devised that will train the spiritual possibilities stored in man, we shall have a system of education which will be the intellectual and ethical counterpart to the many systems devised for building up the human body. Strangely enough, although many nations claim to possess their own systems of physical education, none has so far organized a system of intellectual education; that is, a system of activities that will bring out the latent individual powers of the child, the adolescent, and the youth, with all its sequel of rightly obtained information.

Three other types of educators should be included with those just mentioned; The playground director, the boy scout leader, and the organizer of any of those happy devices for training children in the practice of citizenship and the golden rule, introduced in the public school by Mr. Gill and in reformatories by Mr. George. They also preside over an activity, and let nature do the rest. The superiority of their methods over those to which academic education still clings

is shown by the fact that the moment educators forget that their mission is to train and let knowledge take care of itself, the moment they think they ought to lay the stress on the result, rather than on the process itself—that is, the moment they think they ought to teach—the whole activity collapses, interest and life are gone, and the scheme soon shows unmistakable signs of sham and superficiality, which are as harmful to the moral character of the children as dogmatism is to their intellect.

A system of organized and correlated occupations should receive full recognition from the university. When we are ready to conceive and plan such a system, the problem before us will not be what kind of secondary schools we ought to have in order to fit them for the university, but rather what kind of university activities would be likely to continue, develop, and perfect the work begun at the lower educational agencies.

Free from the university bias, therefore, secondary education should be organized as a system of activities through which the pupil can not help but obtain by himself the information that we now pour into his mind through books and lectures. We will no longer entertain a quantitative view of the process; we will not ask the pupil what he knows, how much knowledge he has gained through the activities performed, any more than we measure the physical strength of the boy or girl with the perverse purpose of depriving the weaker of just the exercise they most need. We will trust nature this time and assume that any normal child performing the right kind of educational activities has necessarily gained the right kind of knowledge. Above all, we will not ask the child how much he has learned, because by so doing we put the teacher in the dangerous temptation to dogmatize, to give second-hand information by short cuts, to reach the goal of knowledge by timesaving and education-saving devices. We have many of these at present. The very eagerness to teach exhibited by schools of any kind to-day stands in the way of real education and therefore of real teaching. Much has been said about faulty methods of teaching, but it has not been realized that it is university standards that have resulted in the organization of the very elements of dogmatism throughout the educational fabric. These elements are the textbook and the course of study, in the midst of which the free action of the conscientious teacher is badly handicapped.

This paper could not possibly be considered a complete presentation of the subject if it did not include an exposé of the practical ways that might make possible the operation of such a system. Of course, it would be impossible to give here a complete program of the educational activities recommended. Yet it may be possible to indicate how, by shifting the conception of the essential part in the

process of education, the very instruments that now are put sometimes to the service of dogmatism may be turned into wonderful implements of intellectual freedom; how, to be more precise, the textbook, which, as already implicated, often enslaves the mind to the authority of the printed page, may be turned into a help, a guide, an instrument of freedom for the mind. The books of to-morrow are bound to be just the opposite of those of to-day. They will not be screens that keep the realities of the world away from the student and make him dispense with the observing, analyzing, comparing, thinking. They will be real connecting links between the child and the world of concrete things and phenomena. Such books will organize the seeing, the measuring, the comparing, the discovering by the pupil. They will not confine themselves to the laboratory as humble laboratory manuals do to-day. They will take the pupil to the museum and ask him to sketch, to describe, to compare, to induce. They will take him to the Brooklyn Bridge and ask him to make a pen picture of the crowd, or they will take the boy and girl to the country road, the city park, the seashore, and ask them to describe such and such light effects, such and such contrasts of form. The observational powers of the child will be directed, educated, trained. Such books will also place the student before the masterpieces of art, both of painting and music, and will drive from the observer whatever power is at his command according to his individual temperament.

They will serve as keys to other books. They will direct the pupils to certain pages of certain books where conflicting opinions appear on historic events; they will direct the intelligent observation of the young writer to the wealth of language stored under the dusty covers of literary masterpieces. They will serve as keys to understanding the pupil's own mind, feelings, and volitions through the introspection of his own self. Truly, there is no field of human learning where the child could not stand as man himself has stood before an unrevealed world. There is no avenue of life where the powers of the child could not be really educated in a nobler sense of the word. Unlimited possibilities lie before the editorial houses of to-morrow, as practically the whole present output of educational literature is waiting to be reshaped from the uninteresting, dogmatic, dead, and static way of the present day, to the suggestive, quickening, and dynamic way of to-morrow.

To be sure, there is much important knowledge that pupils can not possibly acquire themselves. But, as Dewey remarks, "this transmitted material is likely to be fruitful in just the degree in which it is conveyed, in connection with these activities in which the pupils acquire something through their observation and reflections." Therefore, the business of the reformed textbook will be to inter-

we have the transmitted information with the facts actually discovered by the pupil. Such books will therefore be something more than laboratory manuals, for they will bring together sets of facts wisely correlated with the activities engaging the pupil's observation, while in the humanistic arts they will open before the student lines of personal research and opportunities of self-expression.

In describing the textbook of to-morrow the idea has been to show what is meant by an education based on the organization of educational activities. No doubt such an education would not only "equip the child for life," but would enlarge the scope of human life itself. The present disadvantages of common education in regard to preparing the pupils for practical life are causing some reformers to blame the curriculum, on the ground that the kind of knowledge imparted by the average school of to-day is of little use in everyday life. Attention is therefore being directed to vocational activities as more apt to develop in the pupils the qualities that are at premium in the social market.

But, in order to make the school vital and real, it is not necessary to bring about a great change in the contents of the curriculum. It is the direction of its activities that makes all the difference. When education is interpreted in qualitative and functional terms, we fit the pupil for life, for we open his mind, enlarge his feelings, and train his will. He who as a boy has applied himself to the solution of the little problems that arise in the examining of a stone will perhaps be able as a business man to detect the causes of a rise in prices; he who discovers the important facts among irrelevant details or who affirms his faith in his judgment by having reached the truth by his own means is educating himself for life.

For the primary and secondary schools, promotion should be based on the real democratic principle of equality of opportunity. As it is now, no value is given to the possession of the qualities that really distinguish the worth of men, such as love of work, quickness of perception, ability to plan, to observe, to discriminate, power of invention, and originality of procedure. The training of these is the most legitimate purpose of education, particularly in the formative periods of life. The primary and secondary school should be the places where all these qualities should have an opportunity to play. The maximum training of these activities, within individual limitations, should be the only just and democratic basis for promotion. Present methods of promotion based on the ability to retain facts learned in books introduce an utterly artificial standard only attainable by a minority. Such methods, therefore, can never be the basis of a democratic education in the true sense of the word. We see, therefore, that the method of education which emphasizes knowledge-getting as the chief condition of continuance in school is

by its very nature incompatible with the idea of a secondary school devoted to the education of all the people, simply because the process by which the secondary school eliminates the so-called unfit is an artificial one, founded on the ability of the candidate to bring the memory into play and to submit to an unnatural way of getting information. Such is the basic reason why the percentage of failures is so great. Failure in education has no meaning save as a reflection on the efficiency of educational methods. From the point of view of the education of the individual, the idea of failure is irreconcilable with the idea of education, just as it is irreconcilable with the idea of life. What is now called failure is the outcome of an attempt to submit all to process which only a few can successfully undergo.

An educational process, to be considered natural and therefore applicable to any normal being, has to be founded exclusively upon the fulfillment of such activities as are exercised with zest. This is the case with all activities that are of individual and social significance.

In the light of these considerations the question of the relations between the secondary school and the university has to be approached from a new angle. If the education conferred by the secondary school as defined above is the best that can be conceived; if such kind of education is sure to develop the pupil's qualities to the highest degree, it behooves the university to accept the new standards thus introduced by the secondary school in the field of education and to measure educational values in terms of activity instead of in terms of information. Assuming that the university is to be the place where only the best-equipped are allowed to enter, it devolves upon the university so to frame requirements for admission that only the best products of the secondary school can find a ready access to it. Furthermore, by accepting the secondary school standards instead of forcing its own, the university would render a further service to the cause of education by indorsing and consecrating, as it were, the new educational ideals. It is also evident that by enhancing the educational value of the qualities the world prizes most, those qualities the possession of which increases human efficiency in every walk of life, the university will be sure to assemble a selected student body, better equipped than ever before for the pursuit of professional careers.

Just as in the Army, entrance requirements are founded on the degree in which the candidate shows he possesses the physical qualities that are necessary to an efficient soldier, so the university should accept from the secondary schools only those graduates whose mental and moral equipment indicates a high type of professional

worker. The ideal secondary school, having organized its activities along lines that offer a perpetual play to the basic functions of the mind as well as to the qualities of character, should be prepared to furnish the university with a truthful estimate of each of its graduates. Present standards, founded on the ability of the candidate to memorize information, the far from providing a safe test for social efficiency.

The secondary school so conceived would prepare at the same time for life and for the university. It is by preparing for life that the secondary school would prepare for the university. It is by giving all boys and girls the opportunity to develop to the fullest extent the qualities that are of most worth in life that the secondary school on the other hand would prepare for life and comply with the ever-increasing demands of democracy. All pupils would be given the opportunity to develop within the limit of their individual capacities. Work calculated to bring out the mental qualities that are most useful in the battles of life should be the price of permanence in the school and the condition of promotion through it, as it is the price of permanence and promotion in society.

Automatically the secondary school would provide the university with an élite worthy of the privilege of becoming social leaders.

In conclusion, the secondary school should establish its curriculum on the basis of an organization of the intellectual and moral activities on whose development real education rests.

The mere fulfillment of such activities according to each one's ability should be the only factor in determining the permanence of pupils in school. This condition would automatically make secondary education a right to any boy or girl, and a duty of the State to confer upon all boys and girls.

The range of activities in the secondary school should be sufficiently wide to afford an easy path for all pupils, according to their individual temperaments and vocations.

Normal schools and pedagogical departments should map out a correlated program of educational activities throughout primary and secondary schools. After such a plan has been successfully tried, a joint conference of educators from secondary and higher institutions should devise a new system of rating the merits of the graduates from the secondary schools based on a functional and qualitative estimate of the education previously received by the candidate.

The central idea of such a plan would be the organization of a comprehensive program of research and constructive work in language, number, science, and literature, to be performed by the pupils in primary and high schools. Such operations would increase in complexity through the grades and would cover all "subjects," the

mere teaching of which is the aim of the educational machinery of to-day. It is hard to conceive of a more fruitful task for normal schools than the discussion of this problem, with a view to agreeing upon an organic program of post-kindergarten "occupations" which should be both highly educational in their performance and yielding the kind and the amount of information demanded by modern life.

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